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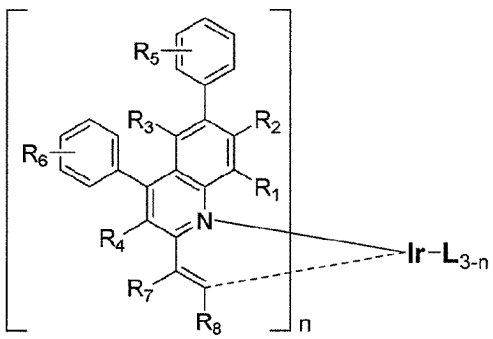
(54) Novel red electroluminescent compounds and organic electroluminescent device using the same

(57) The present invention relates to novel organic electroluminescent compounds exhibiting high luminous efficiency, and organic electroluminescent devices comprising the same. The organic electroluminescent compounds according to the invention are represented by Chemical Formula (1):

Chemical Formula 1



EP 2 062 959 A2

Description

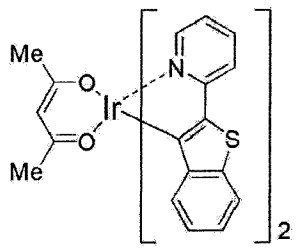
FIELD OF THE INVENTION

[0001] The present invention relates to novel organic electroluminescent compounds exhibiting high luminous efficiency and organic electroluminescent devices comprising the same.

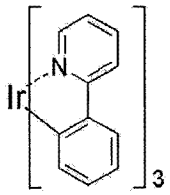
BACKGROUND OF THE INVENTION

[0002] The most important factor to determine luminous efficiency in an OLED (organic light-emitting diode) is the type of electroluminescent material. Though fluorescent materials has been widely used as an electroluminescent material up to the present, development of phosphorescent materials is one of the best methods to improve the luminous efficiency theoretically up to four(4) times, in view of electroluminescent mechanism.

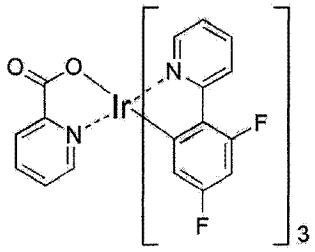
[0003] Up to now, iridium (III) complexes are widely known as phosphorescent material, including (acac)Ir(btp)$_2$, Ir(ppy)$_3$ and Firpic, as the red, green and blue one, respectively. In particular, a lot of phosphorescent materials have been recently investigated in Japan, Europe and America.



(acac)Ir(btp)$_2$

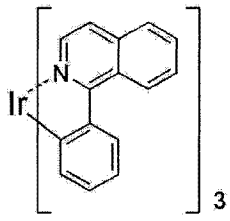


Ir(ppy)$_3$



Firpic

[0004] Among conventional red phosphorescent materials, several materials have been reported to have good EL (electroluminescence) properties. However, very rare materials among them have reached the level of commercialization. As the most preferable material, an iridium complex of 1-phenyl isoquinoline may be mentioned, which is known to have excellent EL property and to exhibit color purity of dark red with high luminous efficiency. [See A. Tsuboyama et al., J. Am. Chem. Soc. 2003, 125(42), 12971-12979.]



1-phenyl isoquinoline

[0005] Moreover, the red materials, having no significant problem of life time, have tendency of easy commercialization if they have good color purity or luminous efficiency. Thus, the above-mentioned iridium complex is a material having noticeable viability of commercialization due to its excellent color purity and luminous efficiency.

[0006] However, the iridium complex is still construed as a material which is merely applicable to small displays, while higher levels of EL properties than those of known materials are practically required for an OLED panel of medium to large size.

SUMMARY OF THE INVENTION

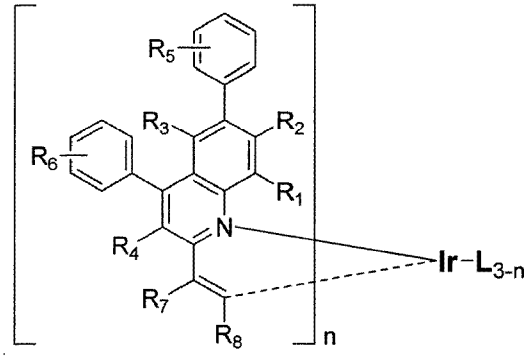
[0007] With intensive efforts to overcome the problems of conventional techniques as described above, the present

inventors have researched for developing novel organic electroluminescent compounds to realize an organic EL device having excellent luminous efficiency and surprisingly improved lifetime. Eventually, the inventors found that luminous efficiency and life property are improved when an iridium complex, which was synthesized by introducing phenyl derivatives at 4- and 6-position of quinoline in a primary ligand compound, is applied as a dopant of an electroluminescent device, and completed the present invention. Thus, the object of the invention is to provide novel organic electroluminescent compounds having the backbone to give more excellent properties as compared to those of conventional red phosphorescent materials. Another object of the invention is to provide novel organic electroluminescent compounds which are applicable to OLED panels of medium to large size.

[0008] Still another object of the invention is to provide organic electroluminescent devices and organic solar cells comprising the novel organic electroluminescent compounds.

[0009] Thus, the present invention relates to novel organic electroluminescent compounds and organic electroluminescent devices comprising the same. Specifically, the organic electroluminescent compounds according to the invention are characterized in that they are represented by Chemical Formula (1) :

Chemical Formula 1



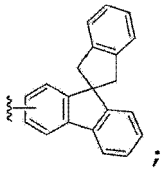
wherein, L is an organic ligand;

R_1 through R_4 independently represent hydrogen, (C1-C60)alkyl, (C1-C60)alkoxy, (C3-C60)cycloalkyl, halogen, tri(C1-C60)alkylsil or tri(C6-C60)arylsilyl;

R_5 and R_6 independently represent hydrogen, (C1-C60)alkyl, halogen or (C6-C60)aryl;

R_7 and R_8 independently represent hydrogen, (C1-C60)alkyl with or without halogen substituent(s), (C6-C60)aryl, halogen, cyano, tri(C1-C60)alkylsilyl, tri(C6-C60)arylsilyl, (C1-C60)alkoxy, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, di(C1-C60)alkylamino or di(C6-C60)arylamino, or R_7 and R_8 may be linked via (C3-C12)alkylene or (C3-C12)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring;

the alkyl, aryl of R_7 and R_8, or the alicyclic ring, or the monocyclic or polycyclic aromatic ring formed therefrom by linkage via (C3-C12)alkylene or (C3-C12)alkenylene with or without a fused ring may be further substituted by one or more substituent(s) selected from (C1-C60)alkyl with or without halogen substituent(s), halogen, cyano, tri(C1-C60)alkylsilyl, tri(C6-C60)arylsilyl, (C1-C60)alkoxy, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, di(C1-C60)alkylamino, di(C6-C60) arylamino, phenyl, naphthyl, anthryl, fluorenyl, spirobifluorenyl and



;

and

n is an integer from 1 to 3.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010]

Fig. 1 is a cross-sectional view of an OLED.

DETAILED DESCRIPTION OF THE INVENTION

[0011] Referring now to the Drawings, Fig. 1 illustrates a cross-sectional view of an OLED comprising a Glass 1, a Transparent electrode 2, a Hole injection layer 3, a Hole transport layer, an Electroluminescent layer 5, an Electron transport layer 6, an Electron injection layer 7 and an Al cathode 8.

[0012] The term "alkyl" described herein and any substituents comprising "alkyl" moiety include both linear and branched species.

[0013] The term "aryl" described herein means an organic radical derived from aromatic hydrocarbon via elimination of one hydrogen atom. Each ring comprises a monocyclic or fused ring system containing from 4 to 7, preferably from 5 to 6 cyclic atoms. Specific examples include phenyl, naphthyl, biphenyl, anthryl, indenyl, fluorenyl, phenanthryl, triphenylenyl, pyrenyl, perylenyl, chrysenyl, naphthacenyl and fluoranthenyl, but they are not restricted thereto.

[0014] The term "heteroaryl" described herein means an aryl group containing from 1 to 4 heteroatom(s) selected from N, O and S as the aromatic cyclic backbone atoms, and carbon atom(s) for remaining aromatic cyclic backbone atoms. The heteroaryl may be a 5- or 6-membered monocyclic heteroaryl or a polycyclic heteroaryl which is fused with one or more benzene ring(s), and may be partially saturated. Cyclic heteroatoms in the heteroaryl group may be oxidized or quaternized to form a divalent aryl group such as N-oxide and quaternary salt. Specific examples include monocyclic heteroaryl groups such as furyl, thiophenyl, pyrrolyl, imidazolyl, pyrazolyl, thiazolyl, thiadiazolyl, isothiazolyl, isoxazolyl, oxazolyl, oxadiazolyl, triazinyl, tetrazinyl, triazolyl, tetrazolyl, furazanyl, pyridyl, pyrazinyl, pyrimidinyl, pyridazinyl; polycyclic heteroaryl groups such as benzofuranyl, benzothiophenyl, isobenzofuranyl, benzimidazolyl, benzothiazolyl, benzisothiazolyl, benzisoxazolyl, benzoxazolyl, isoindolyl, indolyl, indazolyl, benzothiadiazolyl, quinolyl, isoquinolyl, cinnolinyl, quinazolinyl, quinoxalinyl, carbazolyl, phenanthridinyl and benzodioxolyl; and corresponding N-oxides (for example, pyridyl N-oxide, quinolyl N-oxide) and quaternary salts thereof; but they are not restricted thereto.

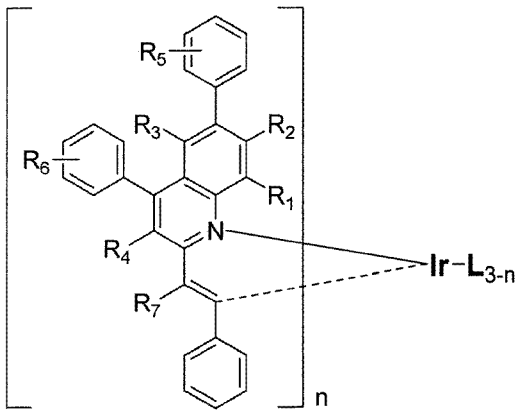
[0015] The naphthyl of Chemical Formula (1) may be 1-naphthyl or 2-naphthyl; the anthryl may be 1-anthryl, 2-anthryl or 9-anthryl; and the fluorenyl may be 1-fluorenyl, 2-fluorenyl, 3-fluorenyl, 4-fluorenyl or 9-fluorenyl.

[0016] The substituents comprising "(C1-C60)alkyl" moiety described herein may contain 1 to 60 carbon atoms, 1 to 20 carbon atoms, or 1 to 10 carbon atoms. The substituents comprising "(C6-C60)aryl" moiety may contain 6 to 60 carbon atoms, 6 to 20 carbon atoms, or 6 to 12 carbon atoms. The substituents comprising "(C3-C60)heteroaryl" moiety may contain 3 to 60 carbon atoms, 4 to 20 carbon atoms, or 4 to 12 carbon atoms. The substituents comprising "(C3-C60)cycloalkyl" moiety may contain 3 to 60 carbon atoms, 3 to 20 carbon atoms, or 3 to 7 carbon atoms. The substituents comprising "(C2-C60)alkenyl or alkynyl" moiety may contain 2 to 60 carbon atoms, 2 to 20 carbon atoms, or 2 to 10 carbon atoms.

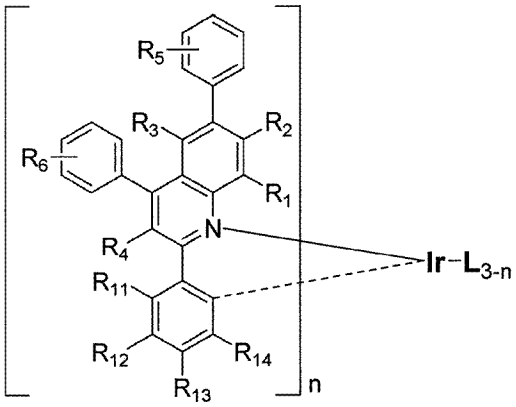
[0017] The alicyclic ring, or the monocyclic or polycyclic aromatic ring formed from R_7 and R_8 in Chemical Formula (1) by linkage via (C3-C12)alkylene or (C3-C12)alkenylene with or without a fused ring is benzene, naphthalene, anthracene, fluorene, indene or phenanthrene. The compound within the square bracket ([]) serves as a primary ligand of iridium, and L serves as a subsidiary ligand. The organic electroluminescent compounds according to the present invention also include the complex with the ratio of primary ligand: subsidiary ligand = 2:1 (n=2) and the complex with the ratio of primary ligand: subsidiary ligand = 1:2 (n=1), as well as tris-chelated complexes without subsidiary ligand (L) (n=3).

[0018] The organic electroluminescent compound according to the invention may be exemplified by the compounds represented by one of Chemical Formulas (2) to (7):

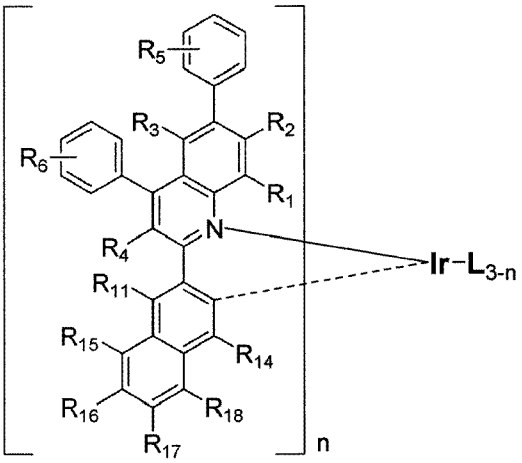
Chemical Formula 2



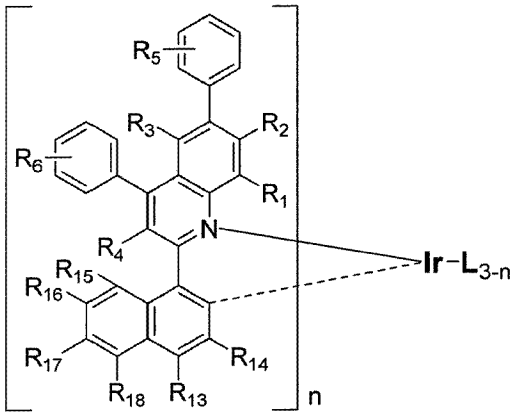
Chemical Formula 3



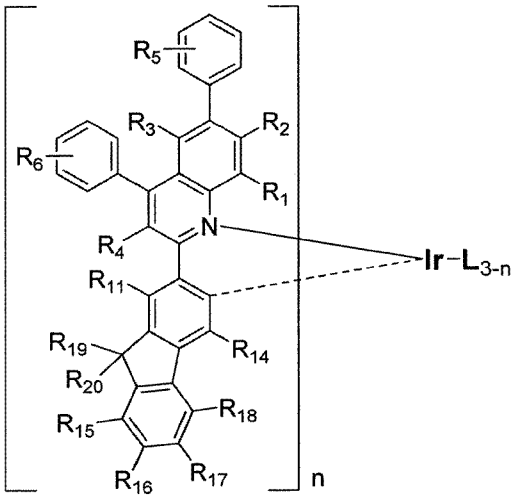
Chemical Formula 4



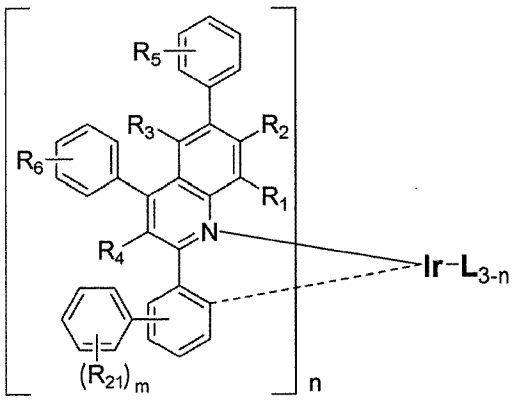
Chemical Formula 5



Chemical Formula 6

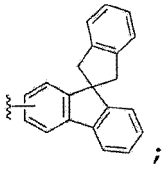


Chemical Formula 7



wherein, L, R_1, R_2, R_3, R_4, R_5, R_6, R_7 and n are defined as in Chemical Formula (1);
R_{11} through R_{18} independently represent hydrogen, (C1-C60)alkyl, halogen, cyano, tri(C1-C60)alkylsilyl, tri(C6-C60) arylsilyl, (C1-C60)alkoxy, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, di(C1-C60)alkylamino, di(C6-C60)arylamino,

phenyl, naphthyl, anthryl, fluorenyl, spirobifluorenyl or



;

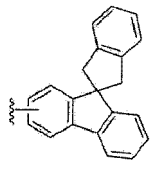
the alkyl, phenyl, naphthyl, anthryl or fluorenyl of R_{11} through R_{18} may be further substituted by one or more substituent(s) selected from (C1-C60)alkyl with or without halogen substituent(s), (C1-C60)alkoxy, halogen, tri(C1-C60)alkylsilyl, tri(C6-C60)arylsilyl, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, di(C1-C60)alkylamino, di(C6-C60)arylamino and (C6-C60)aryl;

R_{19} and R_{20} independently represent hydrogen, (C1-C60)alkyl or (C6-C60)aryl, or R_{19} and R_{20} may be linked via (C3-C12)alkylene or (C3-C12)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring;

R_{21} represents (C1-C60)alkyl, halogen, cyano, tri(C1-C60)alkylsilyl, tri(C6-C60)arylsilyl, (C1-C60)alkoxy, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, phenyl, di(C1-C60)alkylamino, di(C6-C60)arylamino, naphthyl, 9,9-di(C1-C60)alkylfluorenyl or 9,9-di(C6-C60)arylfluorenyl; and

m is an integer from 1 to 5.

[0019] R_{11} through R_{18} independently represent hydrogen, methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, t-butyl, n-pentyl, i-pentyl, n-hexyl, n-heptyl, n-octyl, 2-ethylhexyl, n-nonyl, trifluoromethyl, fluoro, cyano, trimethylsilyl, tripropylsilyl, tri(t-butyl)silyl, t-butyldimethylsilyl, triphenylsilyl, methoxy, ethoxy, butoxy, methylcarbonyl, ethylcarbonyl, t-butylcarbonyl, phenylcarbonyl, dimethylamino, diphenylamino, phenyl, naphthyl, anthryl, fluorenyl or

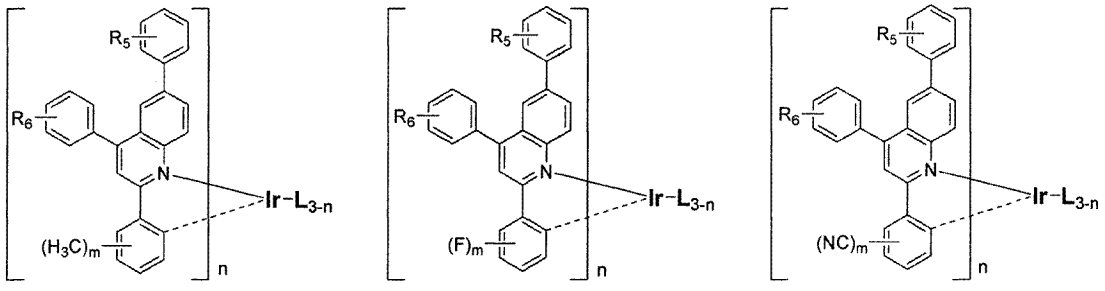


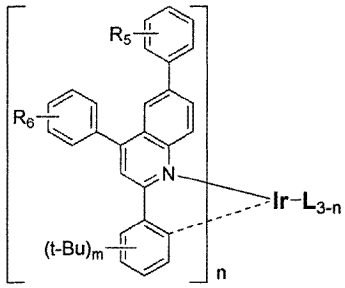
,

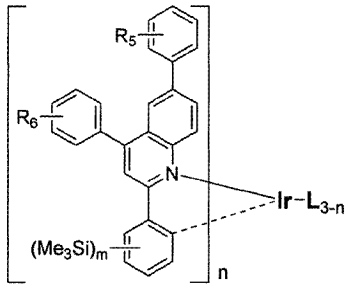
and the fluorenyl may be further substituted by methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, t-butyl, n-pentyl, i-pentyl, n-hexyl, n-heptyl, n-octyl, 2-ethylhexyl, n-nonyl, phenyl, naphthyl, anthryl, trimethylsilyl, tripropylsilyl, tri(t-butyl)silyl, t-butyldimethylsilyl or triphenylsilyl.

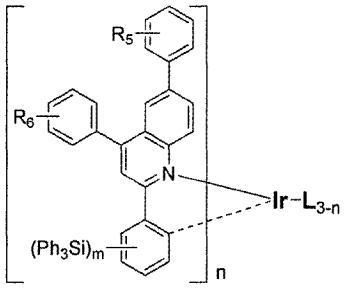
[0020] In Chemical Formula (1), R_1 through R_4 independently represent hydrogen, methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, t-butyl, n-pentyl, i-pentyl, n-hexyl, n-heptyl, n-octyl, ethylhexyl, methoxy, ethoxy, butoxy, cyclopropyl, cyclohexyl, cycloheptyl, fluoro, trimethylsilyl, tripropylsilyl, tri(t-butyl)silyl, t-butyldimethylsilyl or triphenylsilyl; and R_6 represents hydrogen, methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, t-butyl, n-pentyl, i-pentyl, n-hexyl, n-heptyl, n-octyl, ethylhexyl, fluoro, phenyl, naphthyl, anthryl, fluorenyl, or spirobifluorenyl.

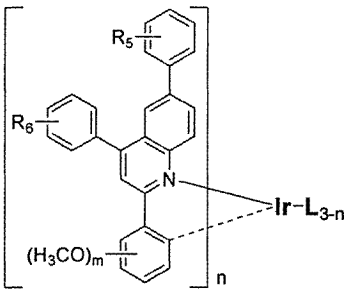
[0021] The organic electroluminescent compounds according to the present invention can be specifically exemplified by the following compounds, but they are not restricted thereto:

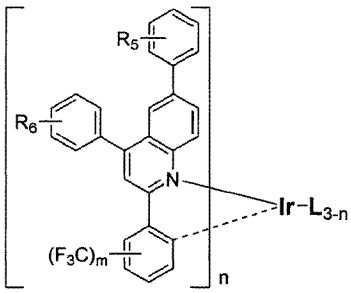


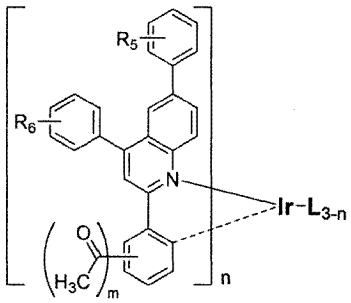

R5
R6
N
Ir–L3-n
(t-Bu)m
n

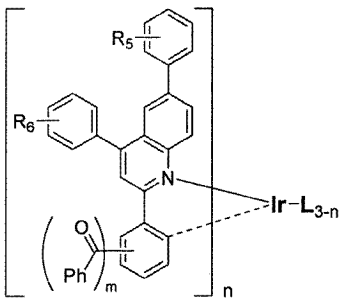

R5
R6
N
Ir–L3-n
(Me3Si)m
n

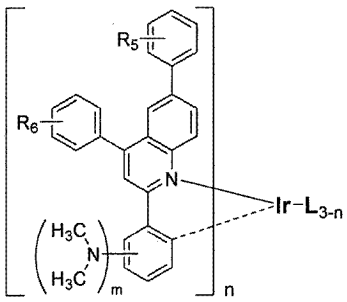

R5
R6
N
Ir–L3-n
(Ph3Si)m
n

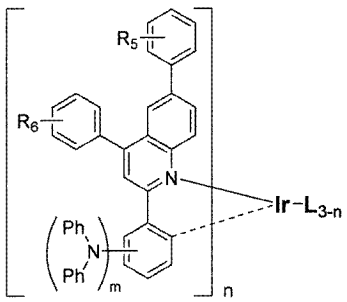

R5
R6
N
Ir–L3-n
(H3CO)m
n

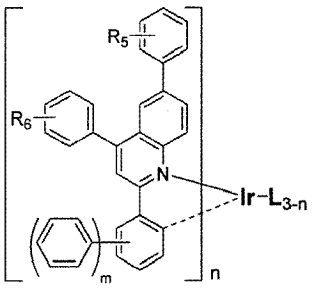

R5
R6
N
Ir–L3-n
(F3C)m
n

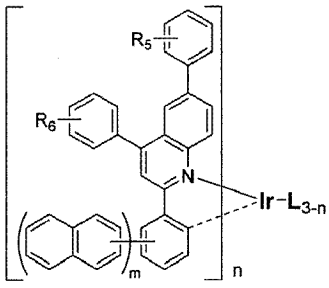

R5
R6
N
Ir–L3-n
O
H3C
m
n

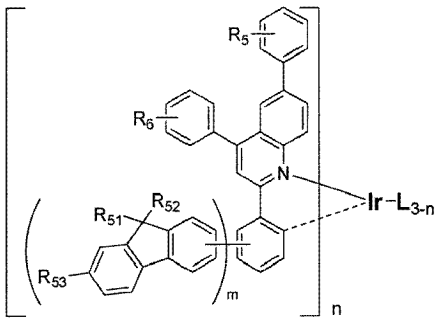

R5
R6
N
Ir–L3-n
O
Ph
m
n

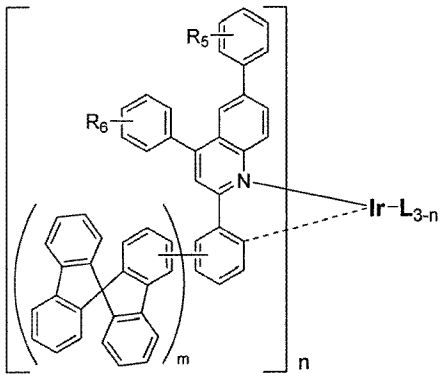

R5
R6
N
Ir–L3-n
H3C
N
H3C
m
n

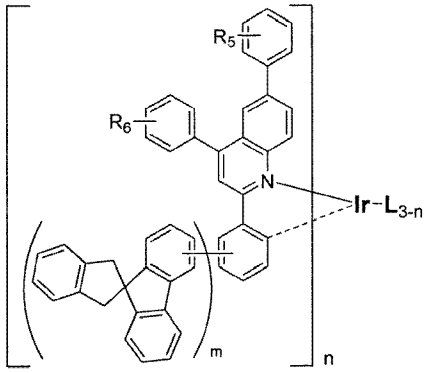

R5
R6
N
Ir–L3-n
Ph
N
Ph
m
n

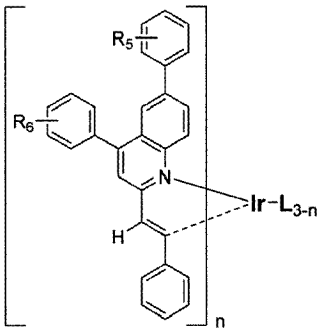

R5
R6
N
Ir–L3-n
m
n

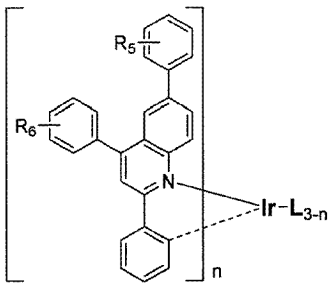

R5
R6
N
Ir–L3-n
m
n

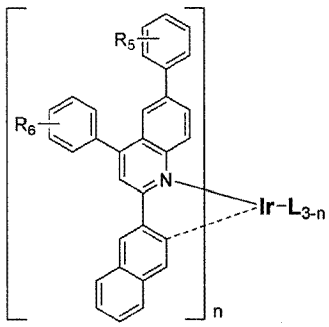

R5
R6
N
Ir–L3-n
R51
R52
R53
m
n

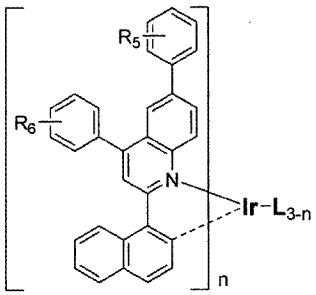


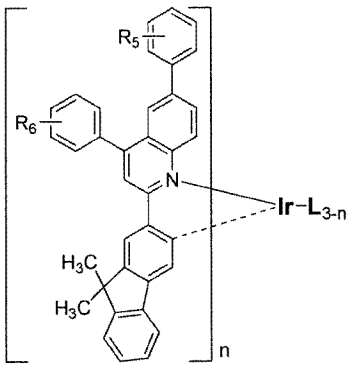


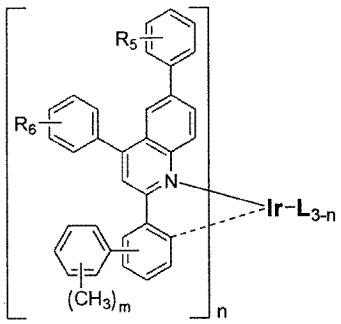


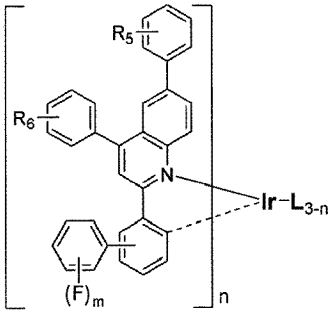


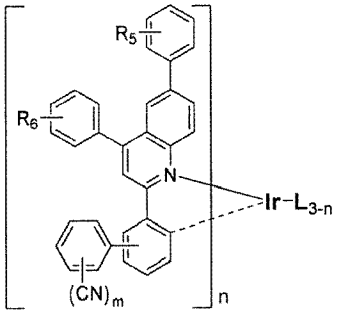


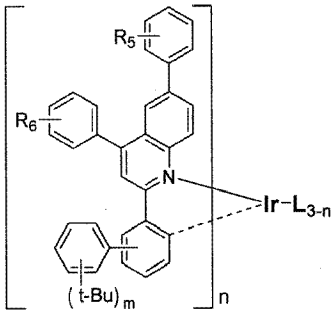


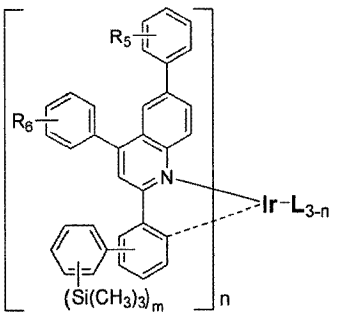


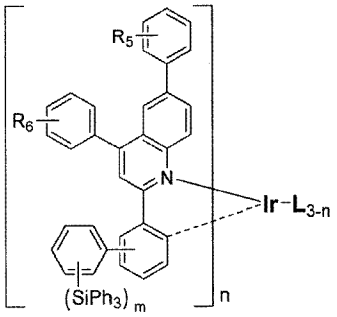


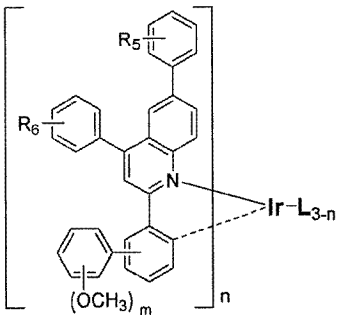


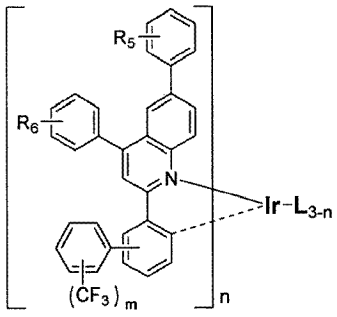


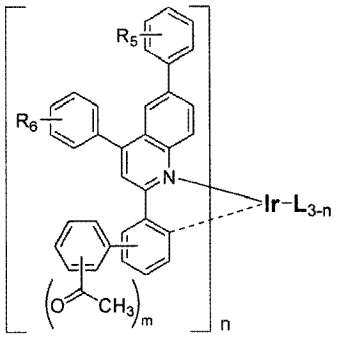


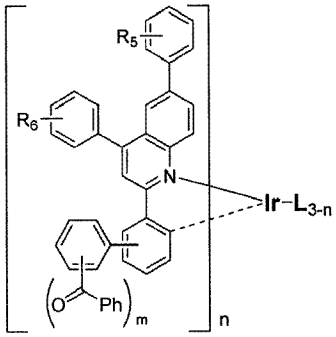

R5
R6
N
Ir–L3-n
(Si(CH3)3)m
n

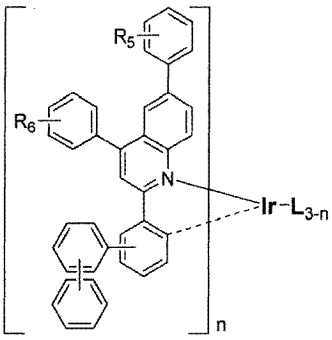

R5
R6
N
Ir–L3-n
(SiPh3)m
n

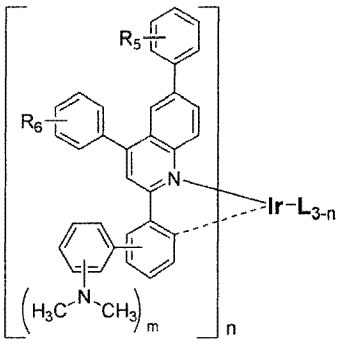

R5
R6
N
Ir–L3-n
(OCH3)m
n

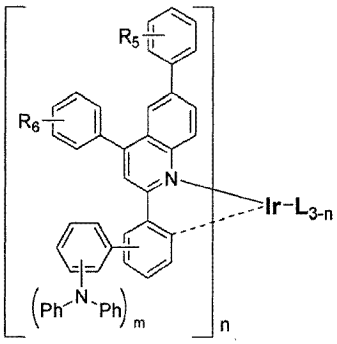

R5
R6
N
Ir–L3-n
(CF3)m
n

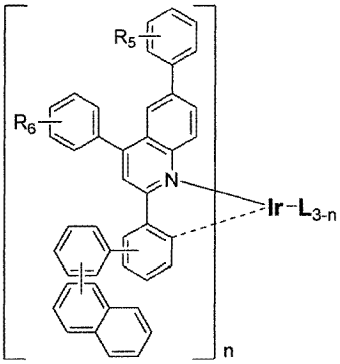

R5
R6
N
Ir–L3-n
O
CH3
m
n

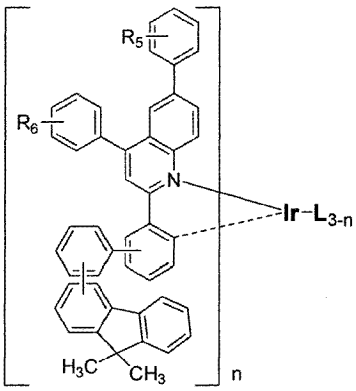

R5
R6
N
Ir–L3-n
O
Ph
m
n


R5
R6
N
Ir–L3-n
n


R5
R6
N
Ir–L3-n
H3C
N
CH3
m
n


R5
R6
N
Ir–L3-n
Ph
N
Ph
m
n


R5
R6
N
Ir–L3-n
n


R5
R6
N
Ir–L3-n
H3C
CH3
n

wherein, L represents an organic ligand;

R_5 and R_6 independently represent hydrogen, methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, t-butyl, n-pentyl, i-pentyl, n-hexyl, n-heptyl, n-octyl, ethylhexyl, fluoro, phenyl or naphthyl;

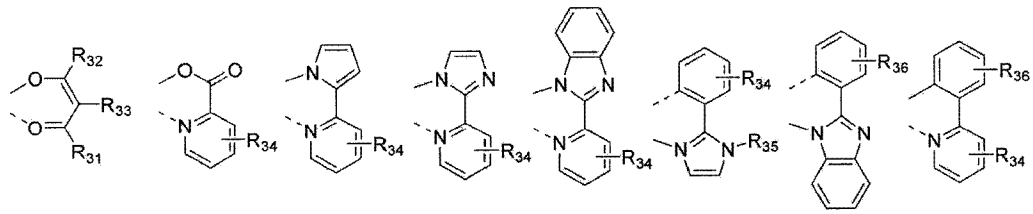
R_{51} and R_{52} independently represent methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, t-butyl, n-pentyl, i-pentyl, n-hexyl, n-heptyl, n-octyl, ethylhexyl, phenyl or naphthyl, or R_{51} and R_{52} may be linked each other via $(C_3$-$C_{12})$alkylene or $(C_3$-$C_{12})$ alkenylene with or without a fused fing to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring;

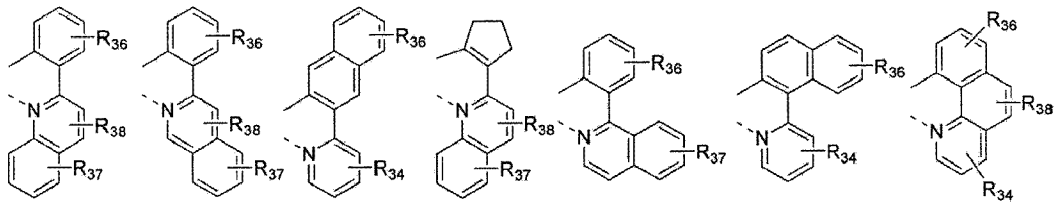
R_{53} represents hydrogen, methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, t-butyl, n-pentyl, i-pentyl, n-hexyl, n-heptyl, n-octyl, 2-ethylhexyl, trimethylsilyl, tripropylsilyl, tri(t-butyl)silyl, t-butyldimethylsilyl, triphenylsilyl, phenyl or naphthyl;

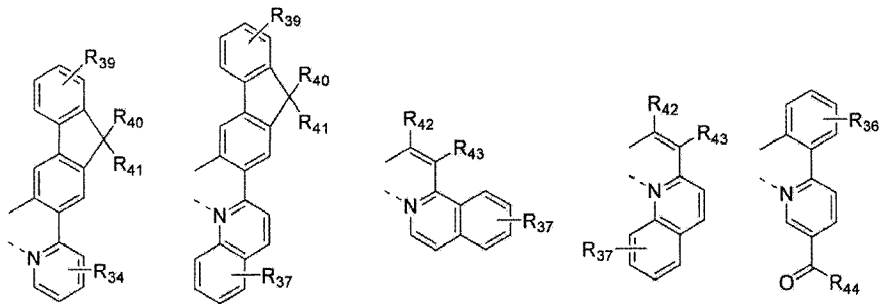
m is an integer from 1 to 5; and

n is an integer from 1 to 3.

[0022] The subsidiary ligands (L) of the organic electroluminescent compounds according to the present invention include the following structures:







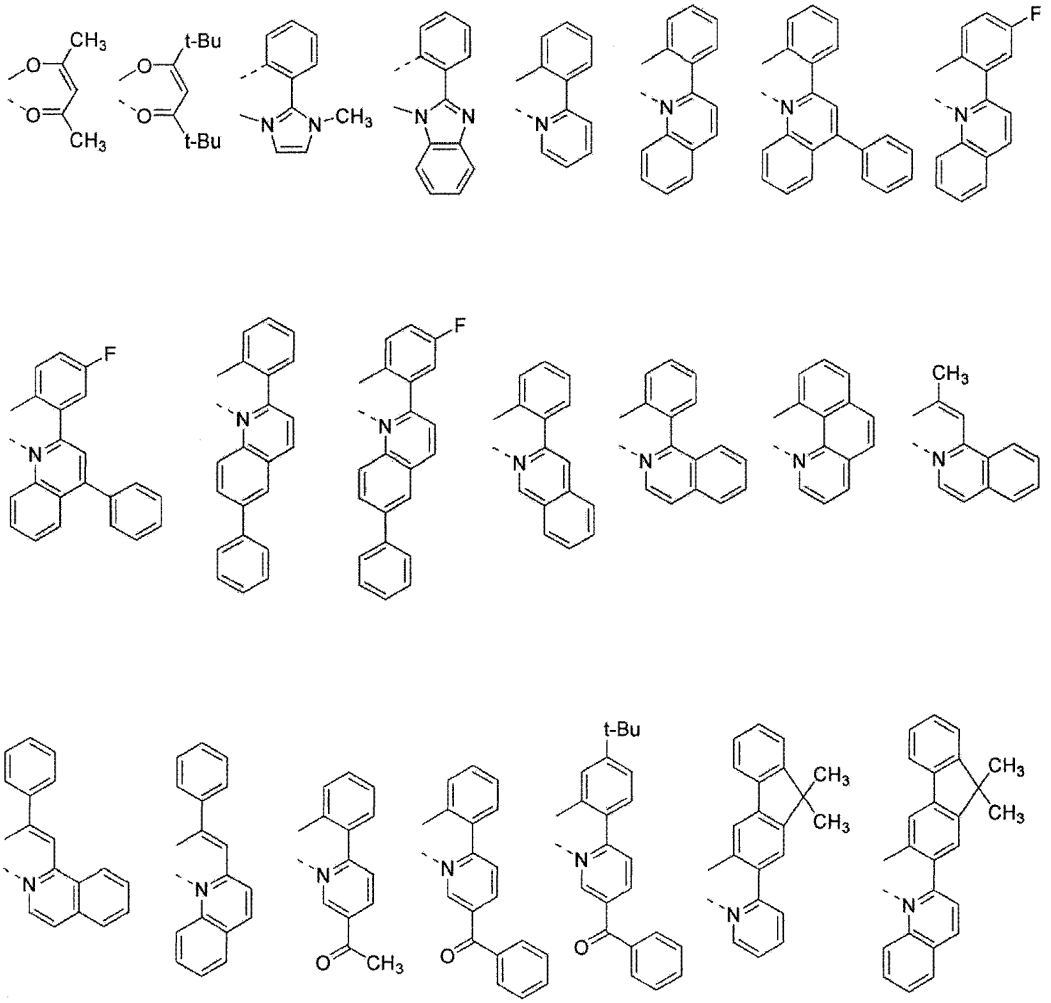
wherein, R_{31} and R_{32} independently represent hydrogen, (C1-C60)alkyl with or without halogen substituent(s), phenyl with or without (C1-C60)alkyl substituent(s), or halogen;

R_{33} through R_{39} independently represent hydrogen, (C1-C60)alkyl, phenyl with or without (C1-C60)alkyl substituent(s), tri(C1-C60)alkylsilyl or halogen;

R_{40} through R_{43} independently represent hydrogen, (C1-C60)alkyl, phenyl with or without (C1-C60)alkyl substituent(s); and

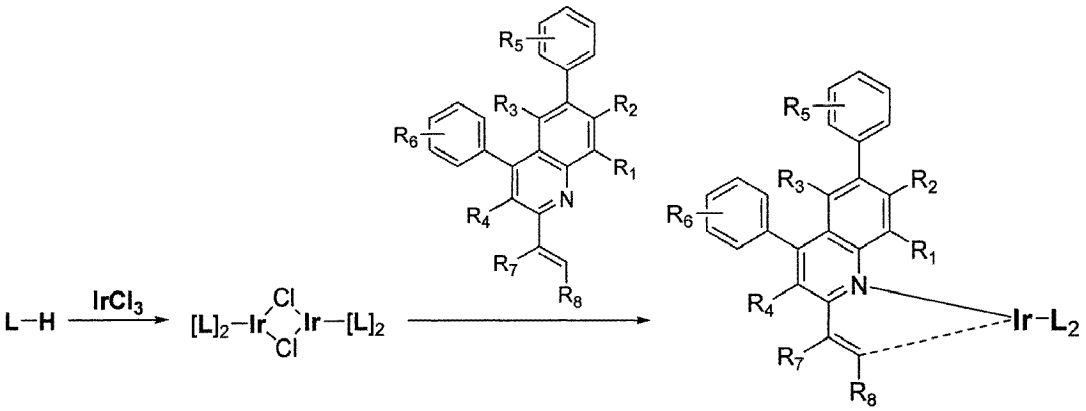
R_{44} represents (C1-C60)alkyl, phenyl with or without (C1-C60)alkyl substituent(s), or halogen.

[0023] The subsidiary ligands (L) of the organic electroluminescent compounds according to the present invention can be exemplified by the following structures, but they are not restricted thereto:

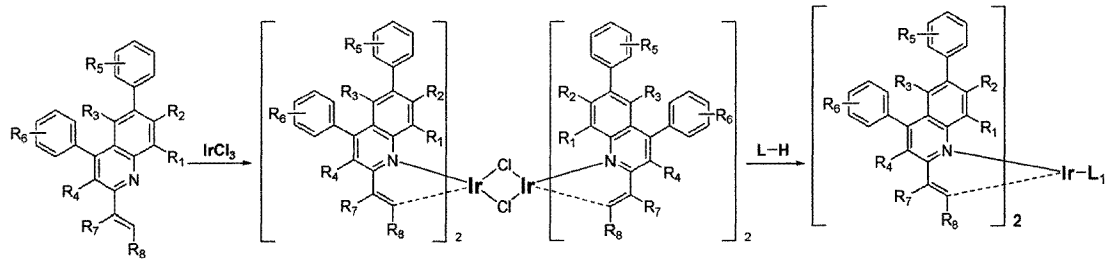


[0024] The processes for preparing the organic electroluminescent compounds according to the present invention are described by referring to Reaction Schemes (1) to (3) shown below:

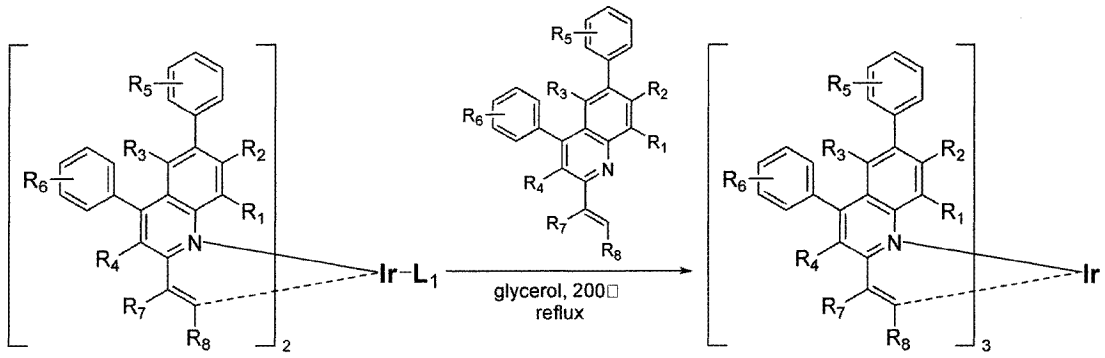
Reaction Scheme 1



Reaction Scheme 2



Reaction Scheme 3



wherein, R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 and L are defined as in Chemical Formula (1).

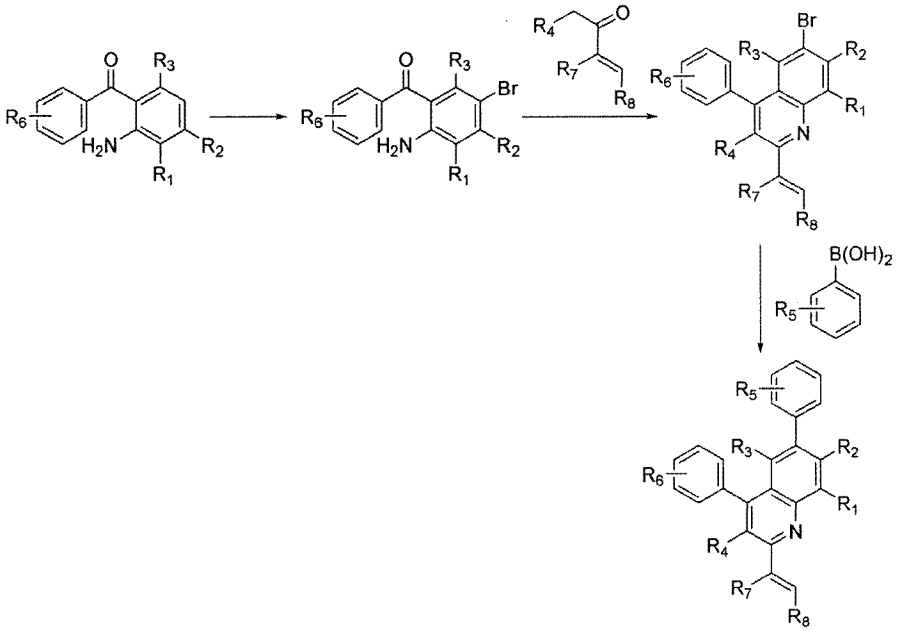
[0025] Reaction Scheme (1) provides a compound of Chemical Formula (1) with n=1, in which iridium trichloride ($IrCl_3$) and subsidiary ligand compound (L-H) are mixed in a solvent at a molar ratio of 1:2~3, and the mixture is heated under reflux before isolating diiridium dimer. In the reaction stage, preferable solvent is alcohol or a mixed solvent of alcohol/water, such as 2-ethoxyethanol, and 2-ethoxyethanol/water mixtures. The isolated diiridium dimer is then heated with a primary ligand compound in organic solvent to provide an organic phosphorescent iridium compound having the ratio of primary ligand: subsidiary ligand of 1:2 as the final product. The reaction is carried out with $AgCF_3SO_3$, Na_2CO_3 or NaOH being admixed with organic solvent such as 2-ethoxyethanol and 2-methoxyethylether.

[0026] Reaction Scheme (2) provides a compound of Chemical Formula (1) with n=2, in which iridium trichloride ($IrCl_3$) and a primary ligand compound are mixed in a solvent at a molar ratio of 1:2~3, and the mixture is heated under reflux before isolating diiridium dimer. In the reaction stage, preferable solvent is alcohol or a mixed solvent of alcohol/water, such as 2-ethoxyethanol, and 2-ethoxyethanol/water mixtures. The isolated diiridium dimer is then heated with the subsidiary ligand compound (L-H) in organic solvent to provide an organic phosphorescent iridium compound having the ratio of primary ligand: subsidiary ligand of 2:1 as the final product. The molar ratio of the primary ligand compound and the subsidiary ligand (L) in the final product is determined by appropriate molar ratio of the reactant depending on the composition. The reaction may be carried out with $AgCF_3SO_3$, Na_2CO_3 or NaOH being admixed with organic solvent such as 2-ethoxyethanol, 2-methoxyethylether and 1,2-dichloroethane.

[0027] Reaction Scheme (3) provides a compound of Chemical Formula (1) with n=3, in which iridium complex prepared according to Reaction Scheme (2) and the primary ligand compound are mixed in glycerol at a molar ratio of 1:2~3, and the mixture is heated under reflux to obtain organic phosphorescent iridium complex coordinated with three primary ligands.

[0028] The compounds employed as a primary ligand in the present invention can be prepared according to Reaction Scheme (4), on the basis of conventional processes:

Reaction Scheme 4



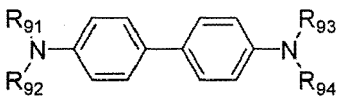
wherein, R_1 through R_8 are defined as in Chemical Formula (1).

[0029] The present invention also provides organic solar cells, which comprises one or more organic electroluminescent compound(s) represented by Chemical Formula (1).

[0030] The present invention also provides an organic electroluminescent device which is comprised of a first electrode; a second electrode; and at least one organic layer(s) interposed between the first electrode and the second electrode; wherein the organic layer comprises one or more compound(s) represented by Chemical Formula (1).

[0031] The organic electroluminescent device according to the present invention is characterized in that the organic layer comprises an electroluminescent region, which comprises one or more organic electroluminescent compound(s) represented by Chemical Formula (1) as electroluminescent dopant in an amount of 0.01 to 10% by weight, and one or more host(s). The host applied to the organic electroluminescent device according to the invention is not particularly restricted, but may be exemplified by 1,3,5-tricarbazolylbenzene, polyvinylcarbazole, m-biscarbazolylphenyl, 4,4'4"-tri (N-carbazolyl)triphenylamine, 1,3,5-tri(2-carbazolylphenyl)benzene, 1,3,5-tris(2-carbazolyl-5-methoxyphenyl) benzene, bis(4-carbazolylphenyl)silane or the compounds represented by one of Chemical Formulas (8) to (11):

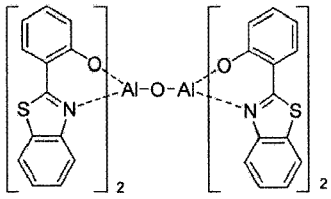
Chemical Formula 8



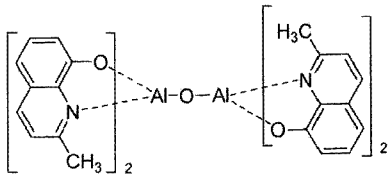
[0032] In Chemical Formula (8), R_{91} through R_{94} independently represent hydrogen, halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl, a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C1-C60)alkyloxy, (C1-C60)alkylthio, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, carboxyl, nitro or hydroxyl, or each of R_{91} through R_{94} may be linked to an adjacent substituent via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring;

the alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, aryl, heteroaryl, arylsilyl, alkylsilyl, alkylamino, or arylamino of R_{91} through R_{94}, or the alicyclic ring, or the monocyclic or polycyclic aromatic ring formed therefrom by linkage to an adjacent substituent via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring may be further substituted by one or more substituent(s) selected from halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl, a 5-or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C1-C60)alkyloxy, (C1-C60)alkylthio, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, carboxyl, nitro and hydroxyl.

Chemical Formula 9

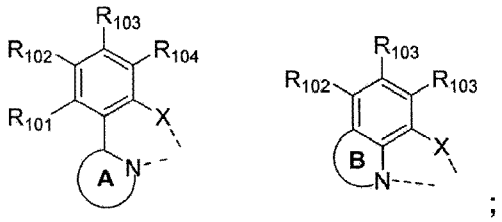


Chemical Formula 10



Chemical Formula 11 $L^1L^2M^1(Q)_y$

[0033] In Chemical Formula (11), the ligands, L^1 and L^2 are independently selected from the following structures:



;

M^1 is a bivalent or trivalent metal;

y is 0 when M^1 is a bivalent metal, while y is 1 when M^1 is a trivalent metal;

Q represents (C6-C60)aryloxy or tri(C6-C60)arylsilyl, and the aryloxy and triarylsilyl of Q may be further substituted by (C1-C60)alkyl or (C6-C60)aryl;

X represents O, S or Se;

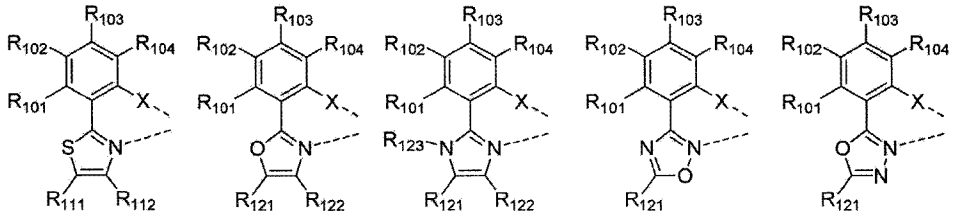
ring A represents oxazole, thiazole, imidazole, oxadiazole, thiadiazole, benzoxazole, benzothiazole, benzimidazole, pyridine or quinoline;

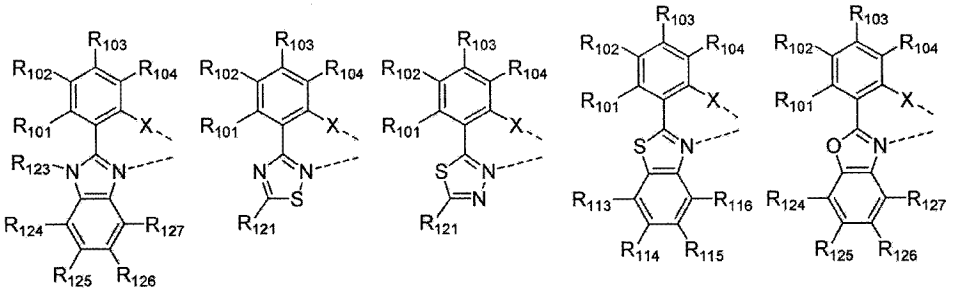
ring B represents pyridine or quinoline, and ring B may be further substituted by (C1-C60)alkyl, or phenyl or naphthyl with or without (C1-C60)alkyl substituent(s);

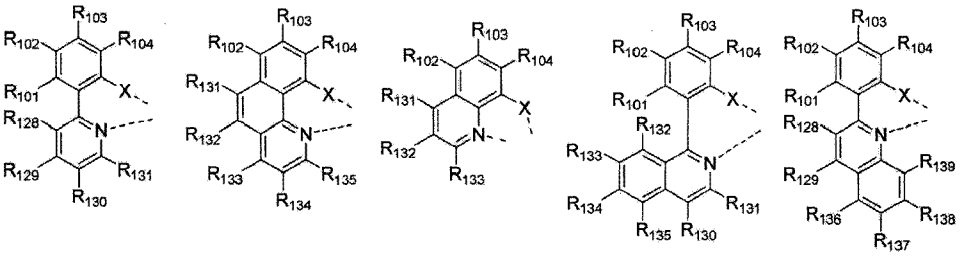
R_{101} through R_{104} independently represent hydrogen, halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl, a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl,

tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60) alkenyl, (C2-C60)alkynyl, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C1-C60)alkyloxy, (C1-C60)alkylthio, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, (C1-C60)alkylcarbonyl, (C6-C60)aryl-carbonyl, carboxyl, nitro or hydroxyl, or each of R_{101} through R_{104} may be linked to an adjacent substituent via (C3-C60) alkylene or (C3-C60)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring, the pyridine or quinoline may form a chemical bond together with R_{101} to form a fused ring;
the alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, aryl, heteroaryl, arylsilyl, alkylsilyl, alkylamino, or arylamino of ring A and R_{101} through R_{104}, or the alicyclic ring, or the monocyclic or polycyclic aromatic ring formed therefrom by linkage to an adjacent substituent via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring may be further substituted by one or more substituent(s) selected from halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl, a 5-or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60) cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C1-C60)alkyloxy, (C1-C60)alkylthio, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, carboxyl, nitro and hydroxyl.

[0034] The ligands, L^1 and L^2 are independently selected from the following structures:







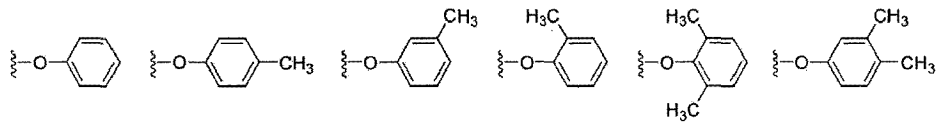
wherein, X represents O, S or Se;
R_{101} through R_{104} independently represent hydrogen, halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl, a 5-or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60) alkenyl, (C2-C60)alkynyl, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C1-C60)alkyloxy, (C1-C60)alkylthio, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, (C1-C60)alkylcarbonyl, (C6-C60)aryl-carbonyl, carboxyl, nitro or hydroxyl, or each of R_{101} through R_{104} may be linked to an adjacent substituent via (C3-C60) alkylene or (C3-C60)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic

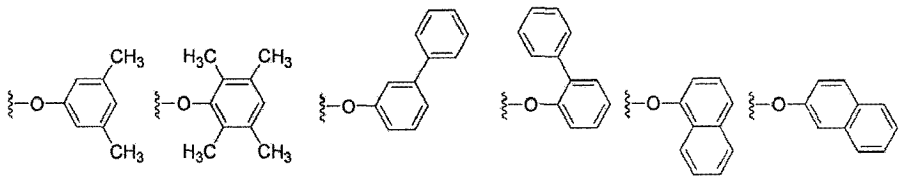
ring;

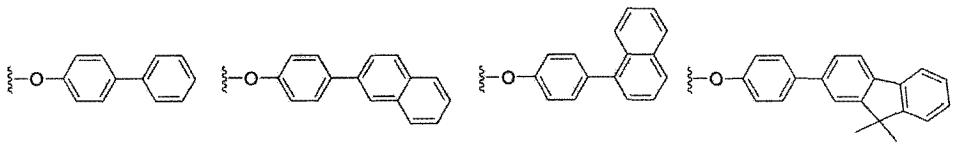
R_{111} through R_{116} and R_{121} through R_{139} independently represent hydrogen, halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl, a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60) bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60) alkyl, (C1-C60)alkyloxy, (C1-C60)alkylthio, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, (C1-C60)alkyl-carbonyl, (C6-C60)arylcarbonyl, carboxyl, nitro or hydroxyl, or each of R_{111} through R_{116} and R_{121} through R_{139} may be linked to an adjacent substituent via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring;

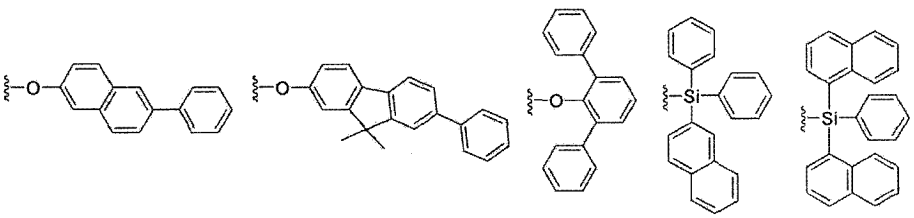
the alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, aryl, heteroaryl, arylsilyl, alkylsilyl, alkylamino or arylamino of R_{101} through R_{104}, R_{111} through R_{116}, and R_{121} through R_{139}, or the alicyclic ring, or the monocyclic or polycyclic aromatic ring formed therefrom by linkage to an adjacent substituent via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring may be further substituted by one or more substituent(s) selected from halogen, (C1-C60)alkyl, (C6-C60) aryl, (C4-C60)heteroaryl, a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C1-C60)alkyloxy, (C1-C60)alkylthio, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, (C1-C60) alkylcarbonyl, (C6-C60)arylcarbonyl, carboxyl, nitro and hydroxyl.

[0035] In Chemical Formula (11), M^1 is a bivalent metal selected from Be, Zn, Mg, Cu and Ni, or a trivalent metal selected from Al, Ga, In and B, and Q is selected from the following structures.

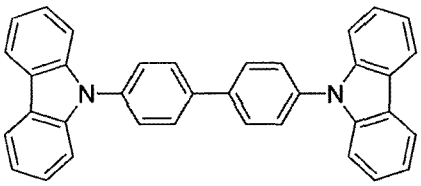


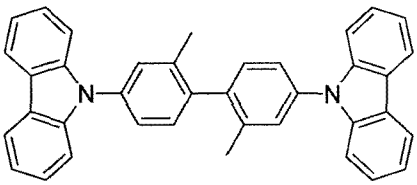




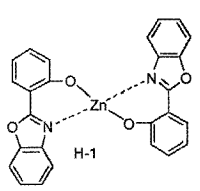


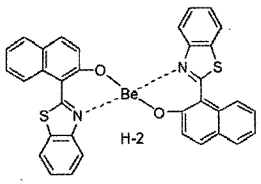
[0036] The compounds of Chemical Formula (8) may be specifically exemplified by the compounds represented by the following structures, but they are not restricted thereto.

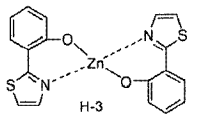


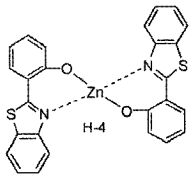


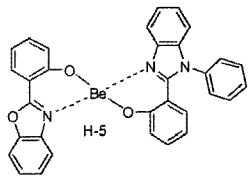
[0037] The compounds represented by one of Chemical Formulas (9) to (11) may be specifically exemplified by the compounds with one of the following structures, but they are not restricted thereto.

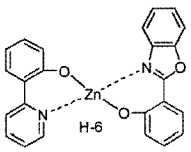


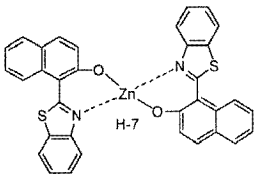


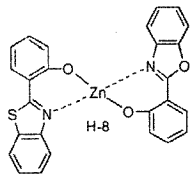


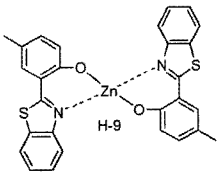


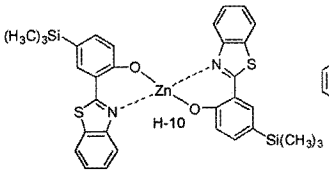


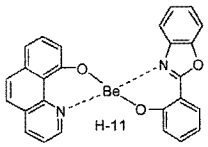


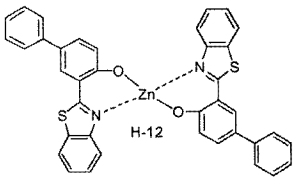


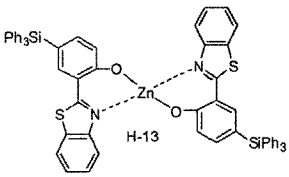


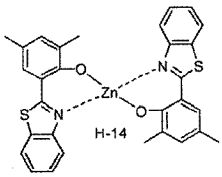


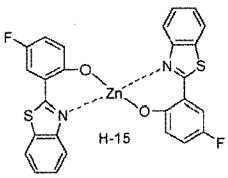


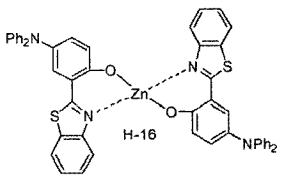


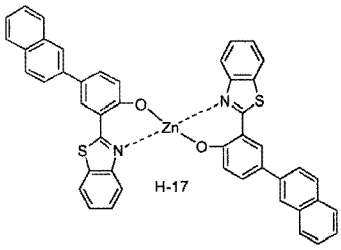








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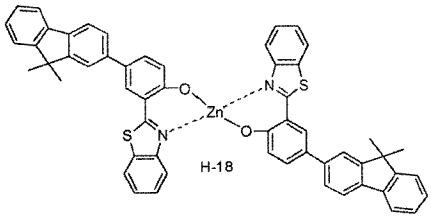
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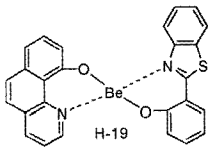
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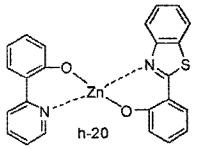
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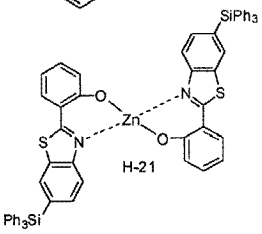
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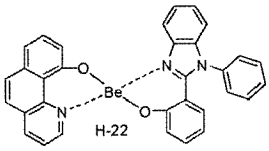
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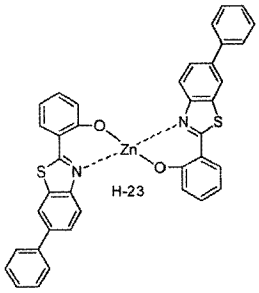
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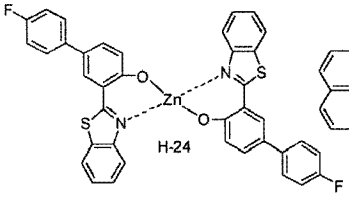
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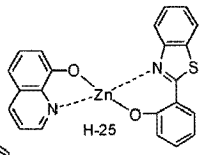
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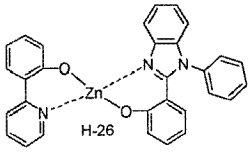
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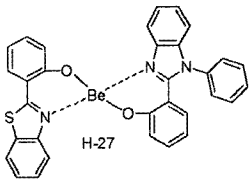
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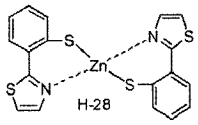
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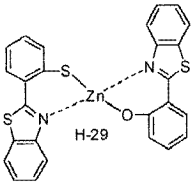
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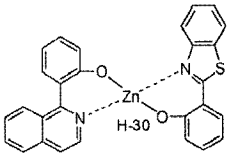
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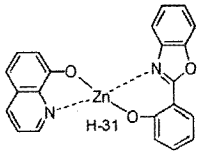
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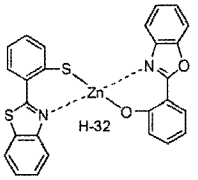
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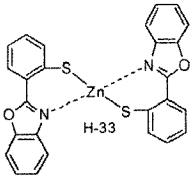
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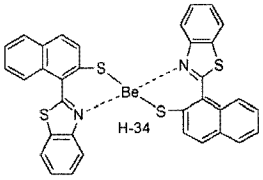
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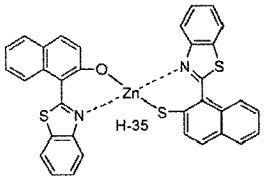
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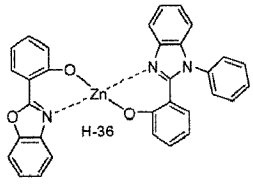
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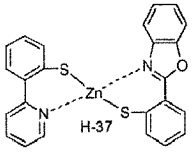
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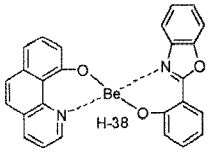
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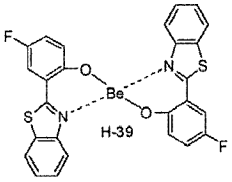
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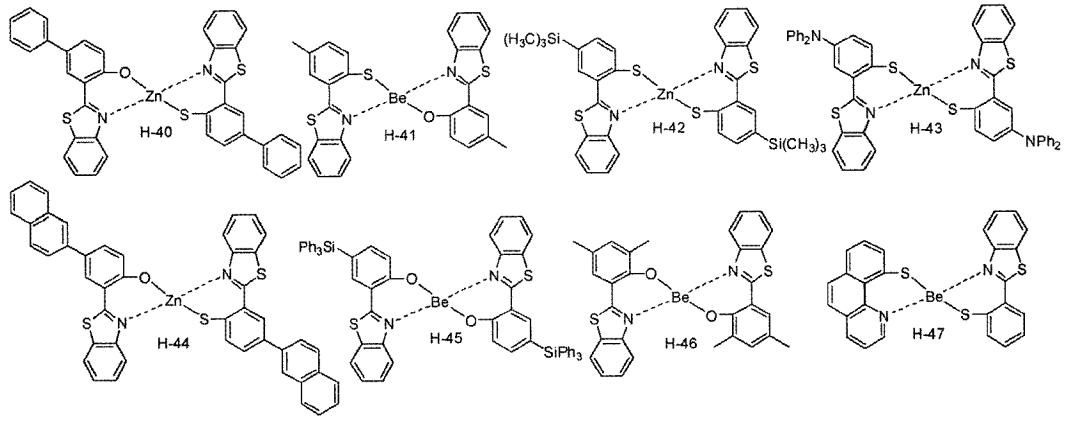
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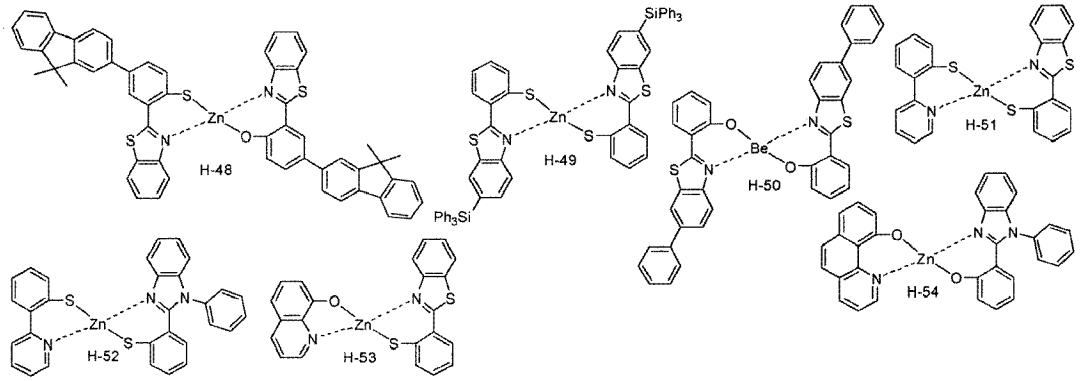
H-41
H-42
H-43
H-44
H-45
H-46
H-47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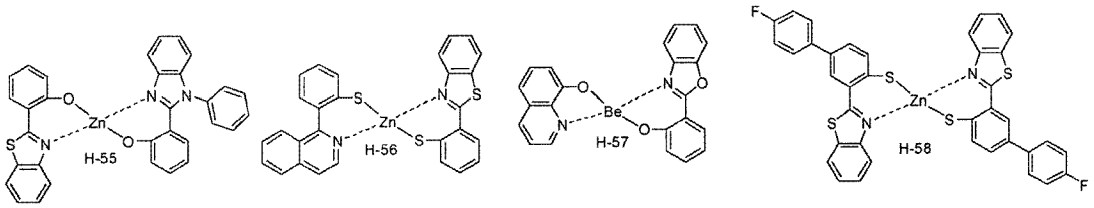
H-49
H-50
H-51
H-52
H-53
H-54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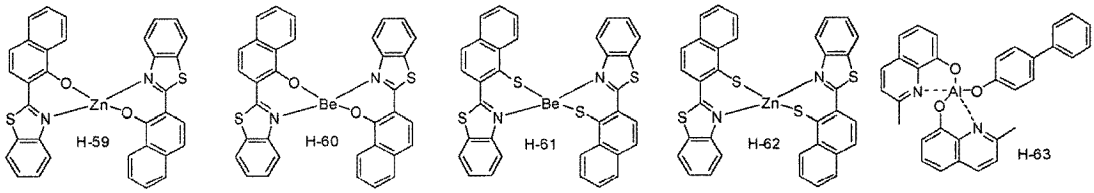
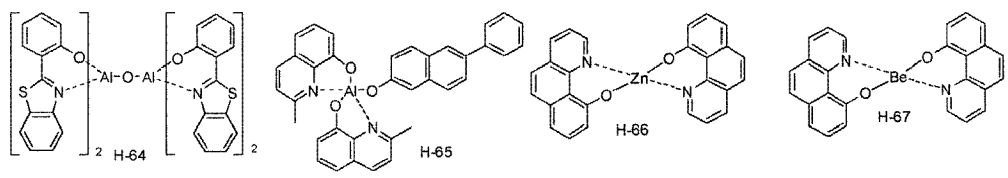
H-56
H-57
H-58


H-59
H-60
H-61
H-62
H-63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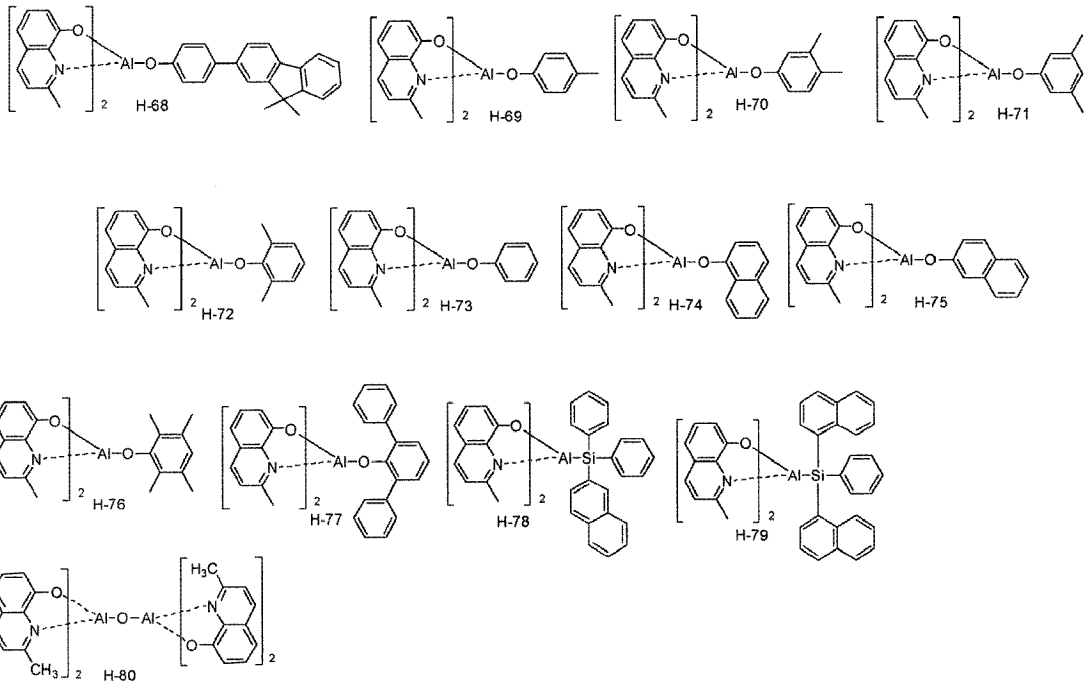
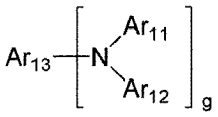
H-65
H-66
H-67



[0038] The electroluminescent layer means the layer where electroluminescence occurs, and it may be a single layer or a multi-layer consisting of two or more layers laminated. When a mixture of host-dopant is used according to the construction of the present invention, noticeable improvement in device life as well as in luminous efficiency could be confirmed.

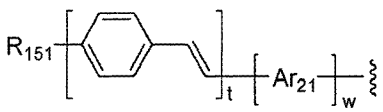
[0039] The organic electroluminescent device according to the invention may further comprise one or more compound (s) selected from arylamine compounds and styrylarylamine compounds, as well as the organic electroluminescent compound represented by Chemical Formula (1). Examples of arylamine or styrylarylamine compounds include the compounds represented by Chemical Formula (12), but they are not restricted thereto:

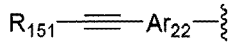
Chemical Formula 12

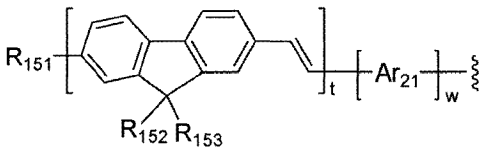


wherein, Ar_{11} and Ar_{12} independently represent (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl, (C6-C60)arylamino, (C1-C60)alkylamin a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, or (C3-C60)cycloalkyl, or Ar_{11} and Ar_{12} may be linked via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring;

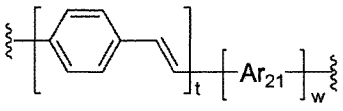
when g is 1, Ar_{13} represents (C6-C60)aryl, (C4-C60)heteroaryl, or an aryl represented by one of the following structural formulas:

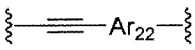


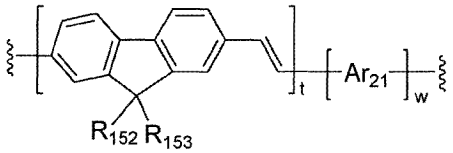




when g is 2, Ar_{13} represents (C6-C60)arylene, (C4-C60)heteroarylene, or an arylene represented by one of the following structural formulas:

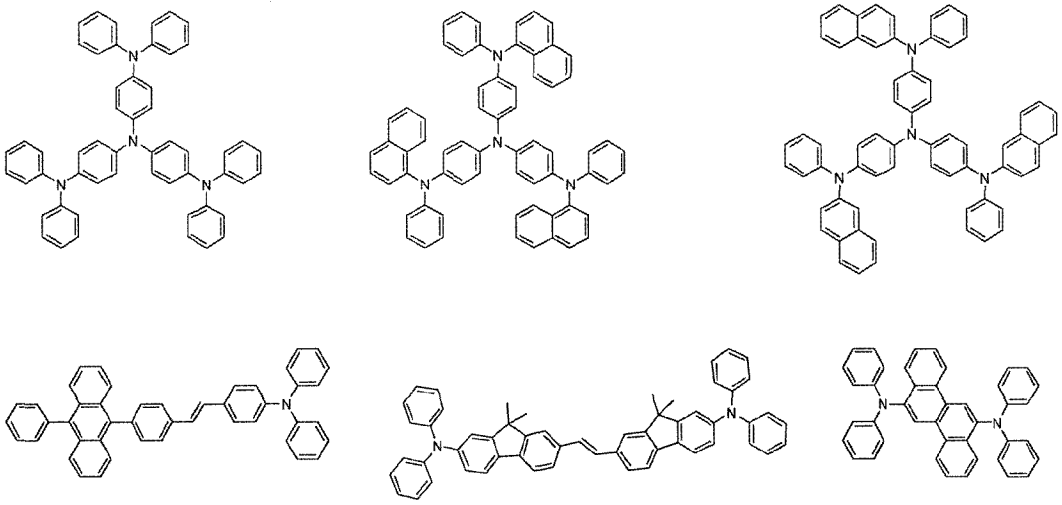


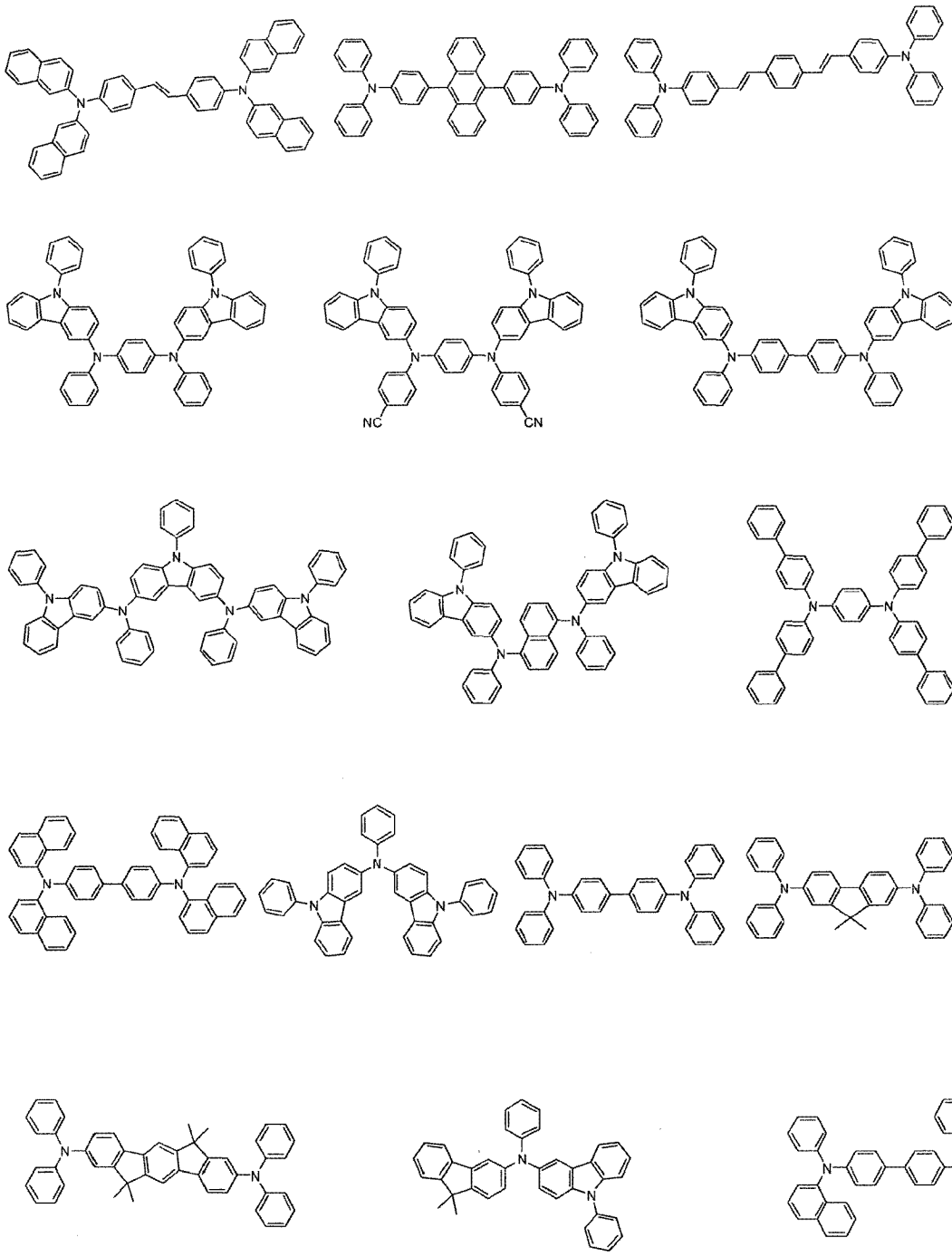




wherein Ar_{21} and Ar_{22} independently represent (C6-C60)arylene or (C4-C60)heteroarylene;
R_{151}, R_{152} and R_{153} independently represent hydrogen, (C1-C60)alkyl or (C6-C60)aryl;
t is an integer from 1 to 4, w is an integer of 0 or 1; and
the alkyl, aryl, heteroaryl, arylamino, alkylamino, cycloalkyl or heterocycloalkyl of Ar_{11} and Ar_{12}, or the aryl, heteroaryl, arylene or heteroarylene of Ar_{13}, or the arylene or heteroarylene of Ar_{21} and Ar_{22}, or the alkyl or aryl of R_{151} through R_{153} may be further substituted by one or more substituent(s) selected from a group consisting of halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl, a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C6-C60)aryloxy, (C1-C60)alkyloxy, (C6-C60)arylthio, (C1-C60)alkylthio, (C1-C60)alkoxycarbonyl, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, carboxyl, nitro and hydroxyl.

[0040] The arylamine compounds and styrylarylamine compounds may be more specifically exemplified by the following compounds, but are not restricted thereto.





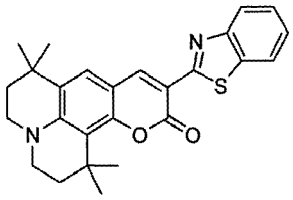
[0041] In an organic electroluminescent device according to the present invention, the organic layer may further comprise one or more metal(s) selected from a group consisting of organic metals of Group 1, Group 2, 4th period and 5th period transition metals, lanthanide metals and d-transition elements, as well as the organic electroluminescent compound represented by Chemical Formula (1). The organic layer may comprise a charge generating layer in addition to the electroluminescent layer.

[0042] The present invention can realize an electroluminescent device having a pixel structure of independent light-emitting mode, which comprises an organic electroluminescent device containing the compound of Chemical Formula (1) as a sub-pixel and one or more sub-pixel (s) comprising one or more compound(s) selected from a group consisting of arylamine compounds and styrylarylamine compounds patterned in parallel at the same time.

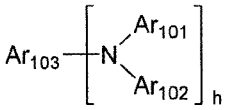
[0043] Further, the organic electroluminescent device is an organic display which comprises one or more compound (s) selected from compounds having electroluminescent peak of wavelength of blue or green, at the same time. The compounds having electroluminescent peak of wavelength of blue or green may be exemplified by the compounds

represented by one of Chemical Formulas (13) to (17), but they are not restricted thereto.

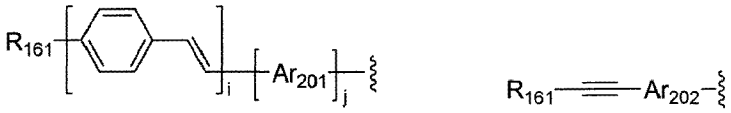
Chemical Formula 13

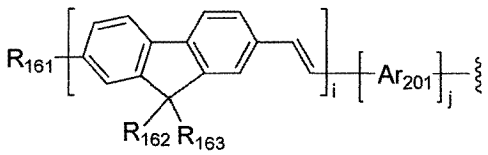


Chemical Formula 14

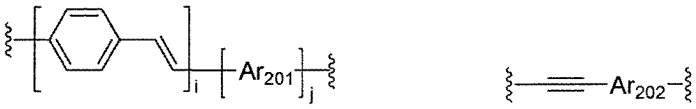


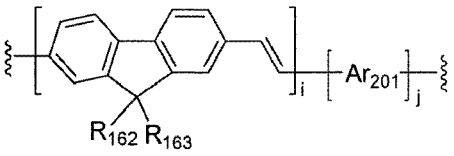
[0044] In Chemical Formula (14), Ar_{101} and Ar_{102} independently represent (C1-C60)alkyl, (C6-C60)aryl, (C4-C60) heteroaryl, (C6-C60)arylamino, (C1-C60)alkylamino, a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, or (C3-C60)cycloalkyl, or Ar_{101} and Ar_{102} may be linked via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring; when h is 1, Ar_{103} represents (C6-C60)aryl, (C4-C60)heteroaryl, or an aryl represented by one of the following structural formulas:





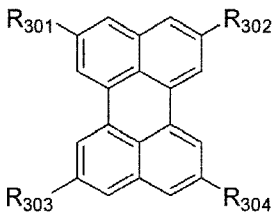
when h is 2, Ar_{13} represents (C6-C60)arylene, (C4-C60)heteroarylene, or an arylene represented by one of the following structural formulas:





wherein Ar_{201} and Ar_{202} independently represent (C6-C60)arylene or (C4-C60)heteroarylene;
R_{161}, R_{162} and R_{163} independently represent hydrogen, (C1-C60)alkyl or (C6-C60)aryl;
i is an integer from 1 to 4, j is an integer of 0 or 1; and
the alkyl, aryl, heteroaryl, arylamino, alkylamino, cycloalkyl or heterocycloalkyl of Ar_{101} and Ar_{102}, or the aryl, heteroaryl, arylene or heteroarylene of Ar_{103}, or the arylene or heteroarylene of Ar_{201} and Ar_{202}, or the alkyl or aryl of R_{161} through R_{163} may be further substituted by one or more substituent(s) selected from a group consisting of halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl, a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C6-C60)aryloxy, (C1-C60)alkyloxy, (C6-C60)arylthio, (C1-C60)alkylthio, (C1-C60)alkoxycarbonyl, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, carboxyl, nitro and hydroxyl.

Chemical Formula 15



[0045] In Chemical Formula (15), R_{301} through R_{304} independently represents hydrogen, halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl, a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C1-C60)alkyloxy, (C1-C60)alkylthio, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, carboxyl, nitro or hydroxyl, or each of R_{301} through R_{304} may be linked to an adjacent substituent via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring;
the alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, aryl, heteroaryl, arylsilyl, alkylsilyl, alkylamino or arylamino of R_{301} through R_{304}, or the alicyclic ring, or the monocyclic or polycyclic aromatic ring formed therefrom by linkage to an adjacent substituent via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring may be further substituted by one or more substituent(s) selected from halogen, (C1-C60)alky (C6-C60)aryl, (C4-C60)heteroaryl, a 5-or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C1-C60)alkyloxy, (C1-C60)alkylthio, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, carboxyl, nitro and hydroxyl.

Chemical Formula 16 $(Ar_{301})_p$-L_{11}- $(Ar_{302})_q$

Chemical Formula 17 $(Ar_{303})r$-L_{12}- $(Ar_{304})s$

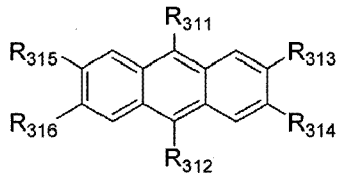
[0046] In Chemical Formulas (16) and (17),
L_{11} represents (C6-C60)arylene or (C4-C60)heteroarylene;
L_{12} represents anthracenylene;
Ar_{301} through Ar_{304} are independently selected from hydrogen, (C1-C60)alkyl, (C1-C60)alkoxy, halogen, (C4-C60)het-

eroaryl, (C5-C60)cycloalkyl and (C6-C60)aryl, and the cycloalkyl, aryl or heteroaryl of Ar_{301} through Ar_{304} may be further substituted by one or more substituent(s) selected from a group consisting of (C6-C60)aryl or (C4-C60)heteroaryl with or without at least one substituent(s) selected from a group consisting of (C1-C60)alkyl, halo(C1-C60)alkyl, (C1-C60) alkoxy, (C3-C60)cycloalkyl, halogen, cyano, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl and tri(C6-C60)arylsilyl; (C1-C60)alkyl with or without halogen substituent(s), (C1-C60)alkoxy, (C3-C60)cycloalkyl, halogen, cyano, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl and tri(C6-C60)arylsilyl; and

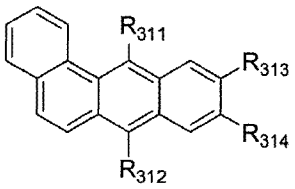
p, q, r and s independently represent an integer from 0 to 4.

[0047] The compounds represented by Chemical Formula (16) or (17) may be exemplified by the derivatives represented by one of Chemical Formulas (18) through (21).

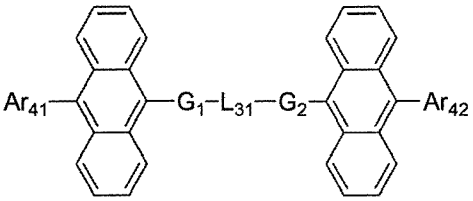
Chemical Formula 18



Chemical Formula 19



Chemical Formula 20

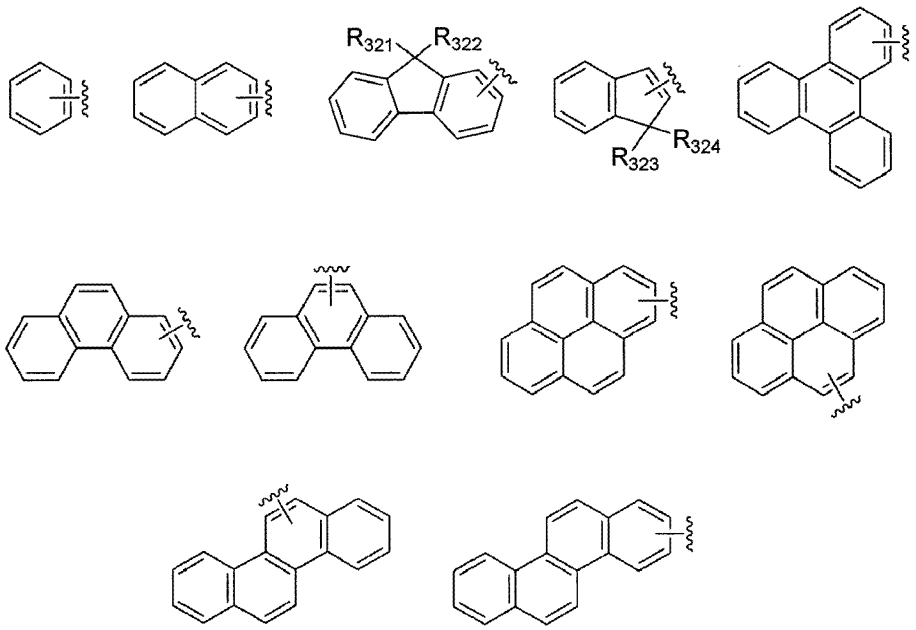


[0048] In Chemical Formulas (18) to (20), R_{311} and R_{312} independently represent (C6-C60)aryl, (C4-C60)heteroaryl or a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, or (C3-C60) cycloalkyl, and the aryl or heteroaryl of R_{311} and R_{312} may be further substituted by one or more substituent(s) selected from a group consisting of (C1-C60)alkyl, halo(C1-C60)alkyl, (C1-C60)alkoxy, (C3-C60)cycloalkyl, (C6-C60)aryl, (C4-C60)heteroaryl, halogen, cyano, tri(C1-C60)alkylsily di(C1-C60)alkyl(C6-C60)arylsilyl and tri(C6-C60)arylsilyl;

R_{313} through R_{316} independently represent hydrogen, (C1-C60)alkyl, (C1-C60)alkoxy, halogen, (C4-C60)heteroaryl, (C5-C60)cycloalkyl or (C6-C60)aryl, and the heteroaryl, cycloalkyl or aryl of R_{313} through R_{316} may be further substituted by one or more substituent(s) selected from a group consisting of (C1-C60)alkyl with or without halogen substituent(s), (C1-C60)alkoxy, (C3-C60)cycloalkyl, halogen, cyano, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl and tri(C6-C60)arylsilyl;

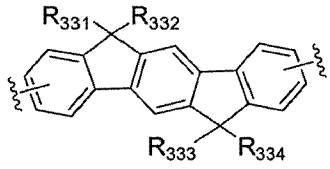
G_1 and G_2 independently represent a chemical bond or (C6-C60)arylene with or without one or more substituent(s) selected from (C1-C60)alkyl, (C1-C60)alkoxy, (C6-C60) aryl, (C4-C60)heteroaryl and halogen;

Ar_{41} and Ar_{42} represent (C4-C60)heteroaryl or aryl selected from the following structures:



the aryl or heteroaryl of Ar_{41} and Ar_{42} may be substituted by one or more substituent(s) selected from (C1-C60)alkyl, (C1-C60)alkoxy, (C6-C60)aryl and (C4-C60)heteroaryl;

L_{31} represents (C6-C60)arylene, (C4-C60)heteroarylene or a compound represented by the following structure:

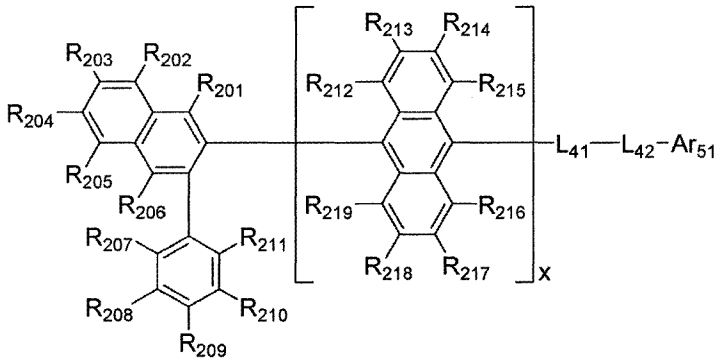


the arylene or heteroarylene of L_{31} may be substituted by one or more substituent(s) selected from (C1-C60)alky (C1-C60)alkoxy, (C6-C60)aryl, (C4-C60)heteroaryl and halogen;

R_{321}, R_{322}, R_{323} and R_{324} independently represent hydrogen, (C1-C60)alk or (C6-C60)aryl, or each of them may be linked to an adjacent substituent via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring;

R_{331}, R_{332}, R_{333} and R_{334} independently represent hydrogen, (C1-C60)alkyl, (C1-C60)alkoxy, (C6-C60)aryl, (C4-C60) heteroaryl or halogen, or each of them may be linked to an adjacent substituent via (C3-C60)alkylene or (C3-C60) alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring.

Chemical Formula 21

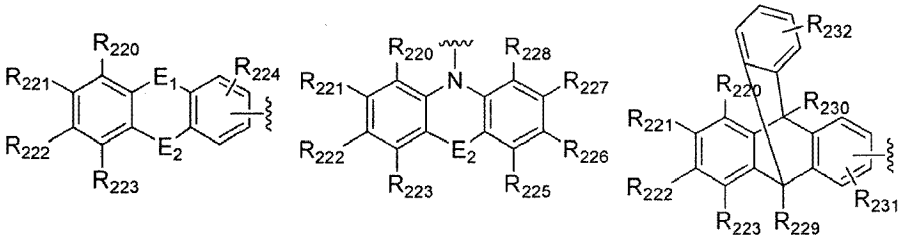


[0049] In Chemical Formula 21,

L_{41} and L_{42} independently represent a chemical bond, or (C6-C60)arylene or (C3-C60)heteroarylene, and the arylene or heteroarylene of L_{41} and L_{42} may be further substituted by one or more substituent(s) selected from (C1-C60)alkyl, halogen, cyano, (C1-C60)alkoxy, (C3-C60)cycloalkyl, (C6-C60)aryl, (C3-C60)heteroaryl, tri(C1-C30)alkylsilyl, di(C1-C30)alkyl(C6-C30)arylsilyl and tri(C6-C30)arylsilyl;

R_{201} through R_{219} independently represent hydrogen, halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl, a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, (C1-C60)alkoxy, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, carboxyl, nitro or hydroxyl, or each of R_{201} through R_{219} may be linked to an adjacent substituent via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring;

Ar_{51} represents (C6-C60)aryl, (C4-C60)heteroaryl, a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, adamantyl, (C7-C60)bicycloalkyl, or a substituent selected from the following structures:



R_{220} through R_{232} independently represent hydrogen, halogen, (C1-C60)alky (C6-C60)aryl, (C4-C60)heteroaryl, a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, (C1-C60)alkoxy, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, carboxyl, nitro or hydroxyl;

E_1 and E_2 independently represent a chemical bond, - $(CR_{233}R_{234})_z$-, -$N(R_{235})$-, -S-, -O-, -$Si(R_{236})$ (R_{237})-, -$P(R_{238})$-, -C(=O)-, -$B(R_{239})$-, -$Zn(R_{240})$-, -Se-, -$Ge(R_{241})(R_{242})$-, $Sn(R_{243})(R_{244})$-, -$Ga(R_{245})$- or -$C(R_{246})$=$C(R_{247})$-;

R_{233} through R_{247} independently represent hydrogen, halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl, a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, (C1-C60)alkoxy, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, carboxyl, nitro or hydroxyl, or each of R_{233} through R_{247} may be linked to an adjacent substituent via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring;

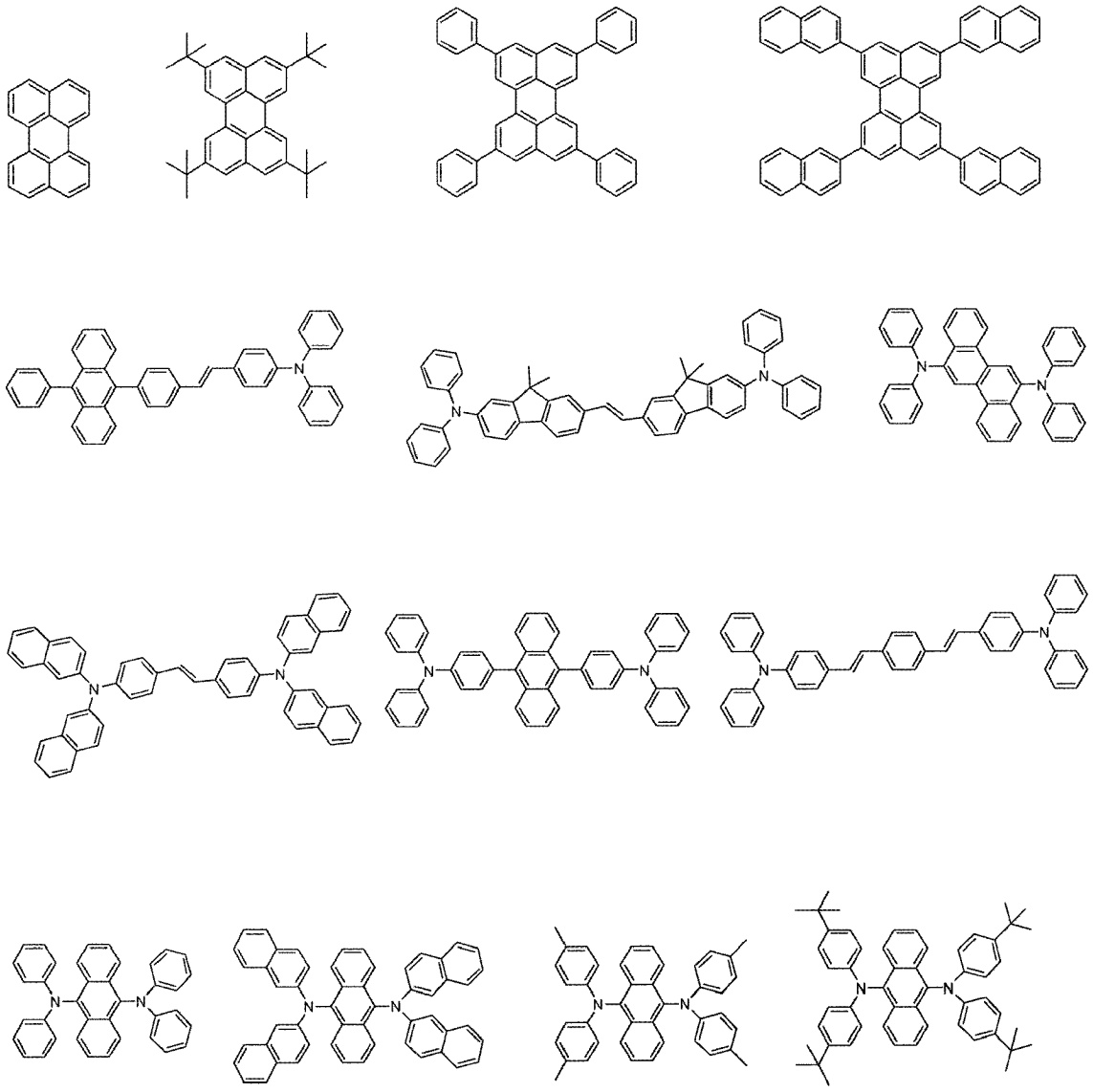
the aryl, heteroaryl, heterocycloalkyl, adamantyl or bicycloalkyl of Ar_{51}, or the alkyl, alkenyl, alkynyl, cycloalkyl, hetero-

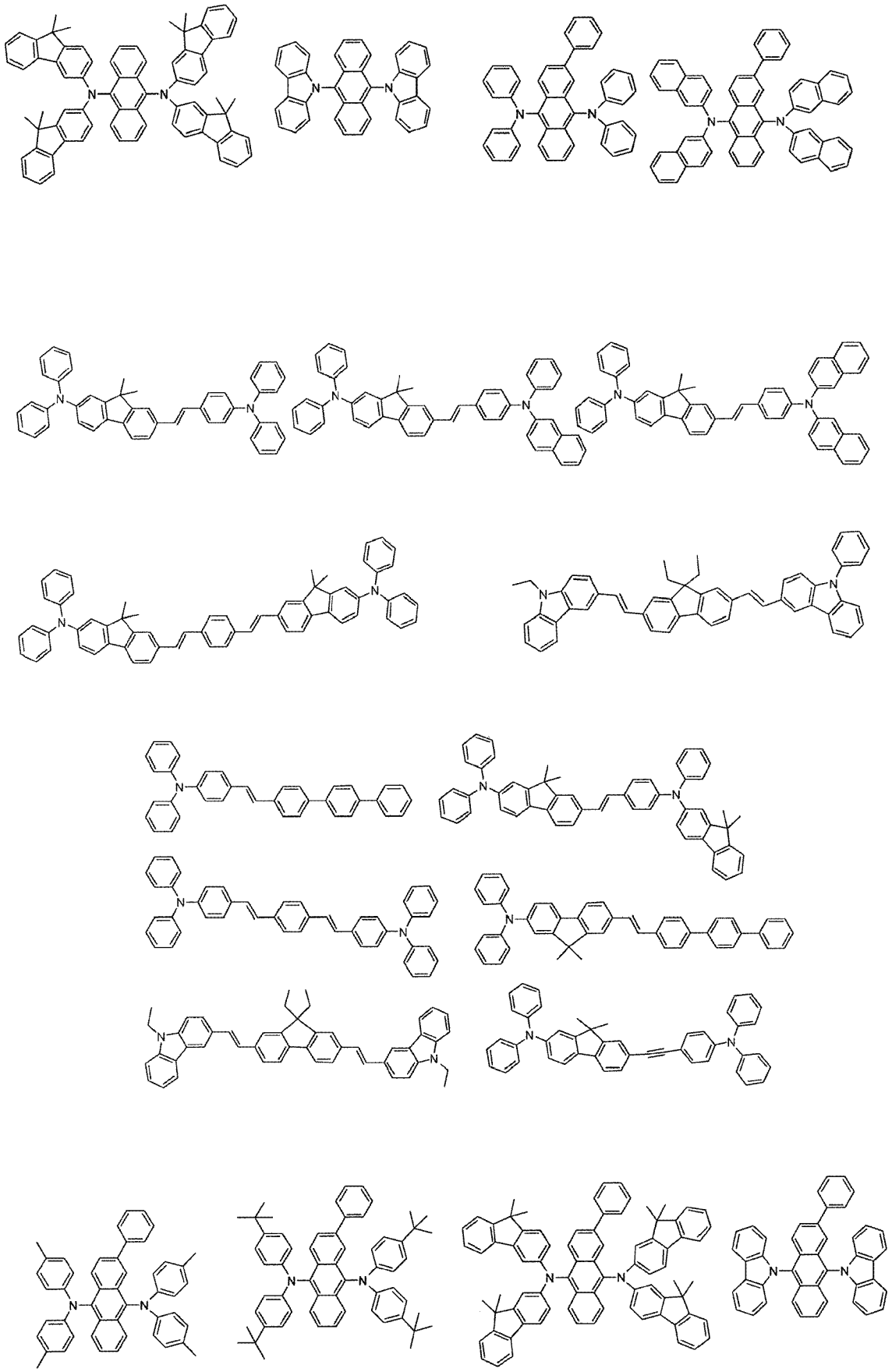
cycloalkyl, aryl, heteroaryl, arylsilyl, alkylsilyl, alkylamino or arylamino of R_{201} through R_{232} may be further substituted by one or more substituent(s) selected from halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl, a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, (C1-C60)alkoxy, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, carboxyl, nitro and hydroxyl;

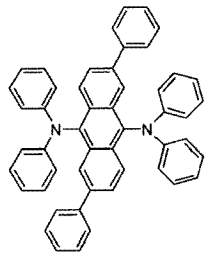
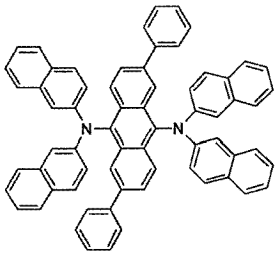
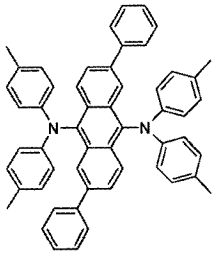
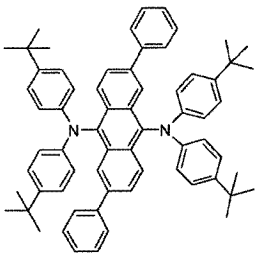
x is an integer from 1 to 4; and

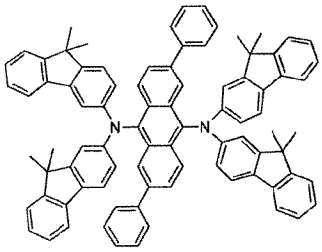
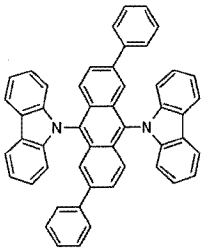
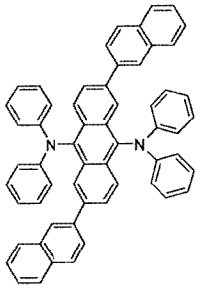
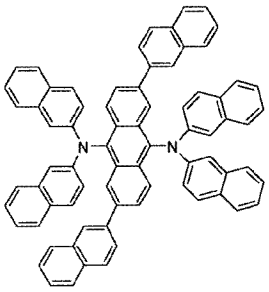
z is an integer from 0 to 4.

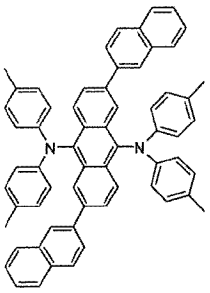
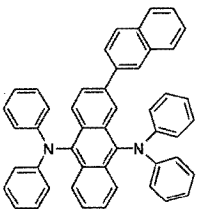
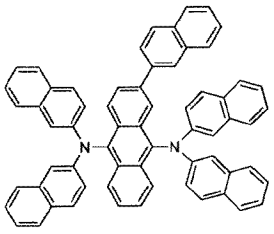
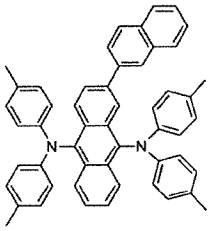
[0050] The organic compounds and organometallic compounds with green or blue electroluminescence can be more specifically exemplified by the following compounds, but they are not restricted thereto.

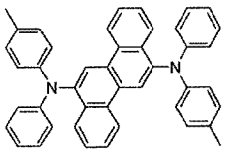
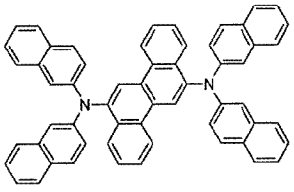
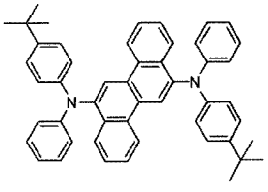


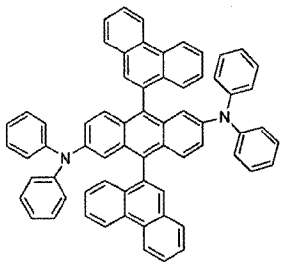
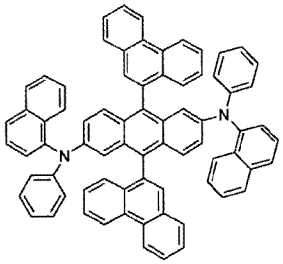
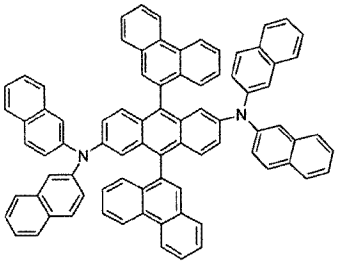
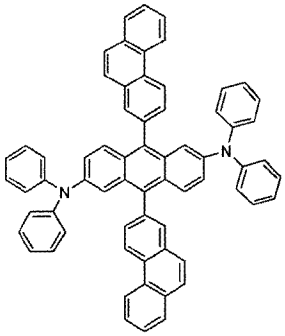
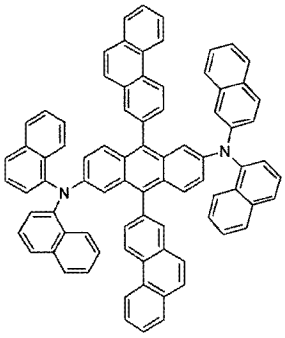
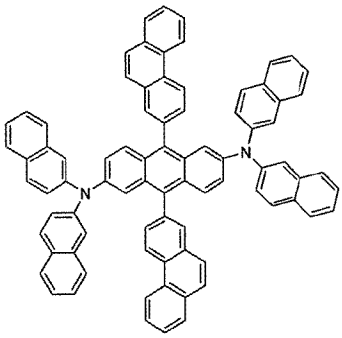
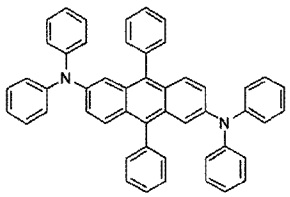
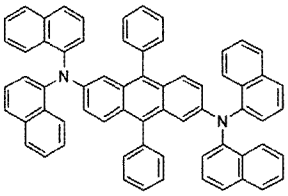
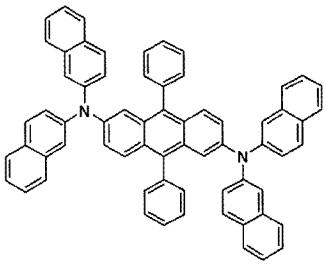
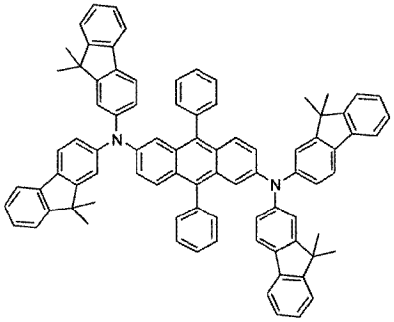
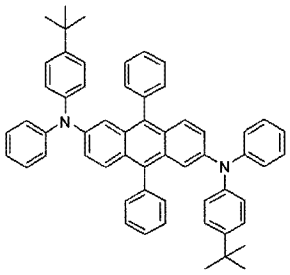
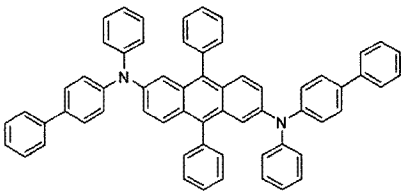
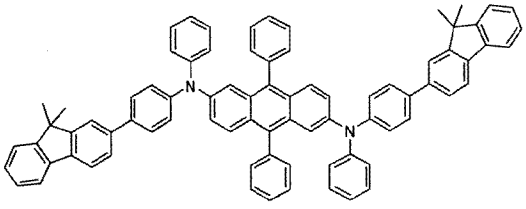
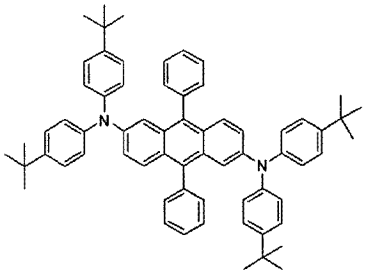


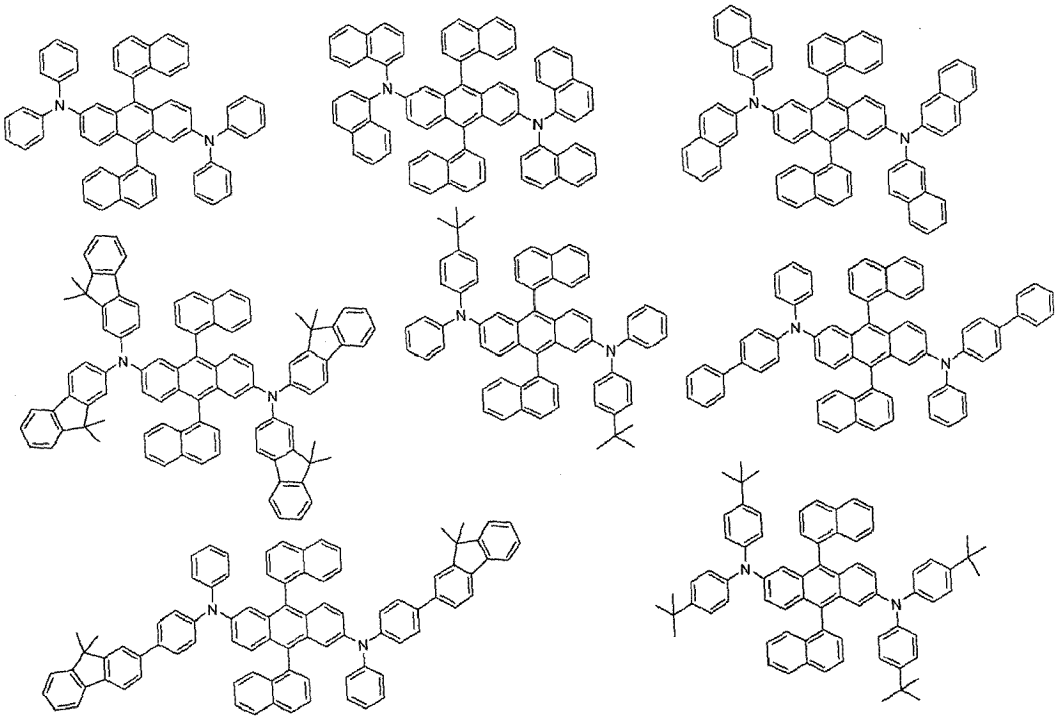





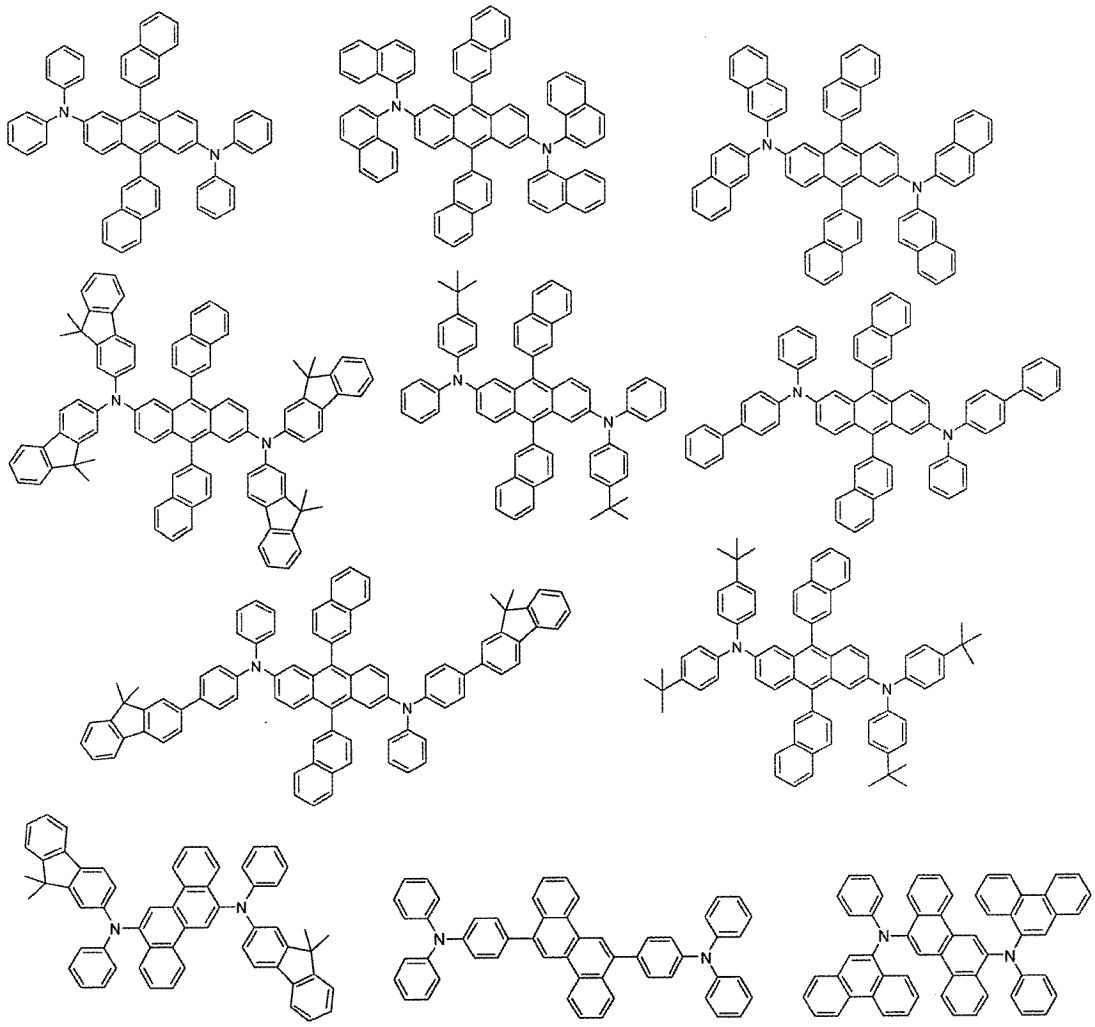





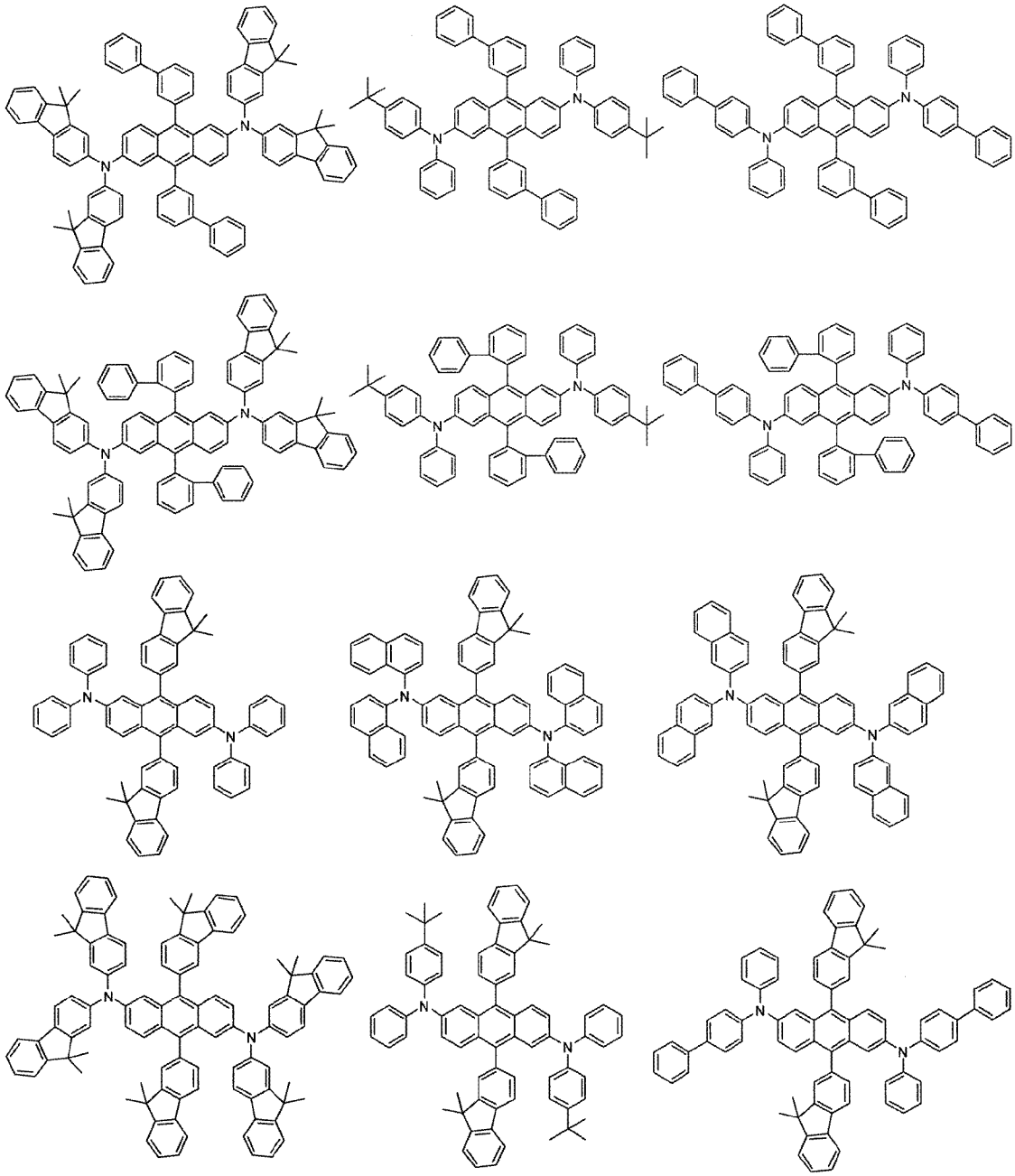





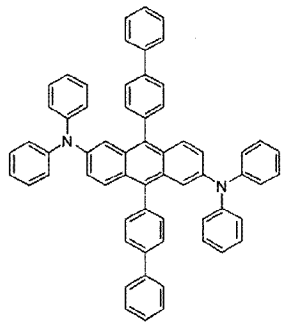
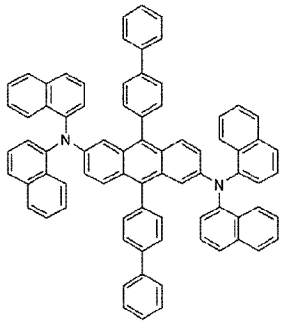
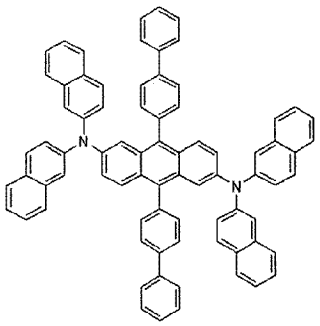
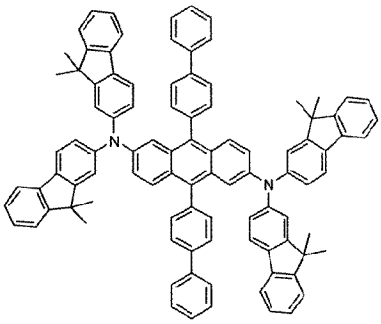
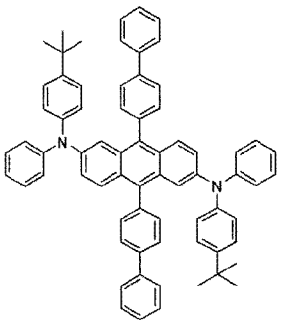
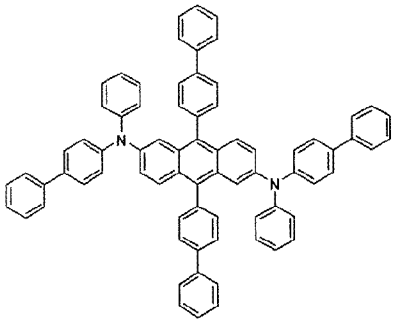
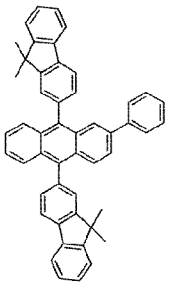
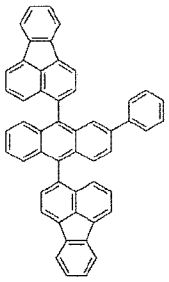
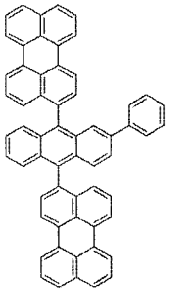
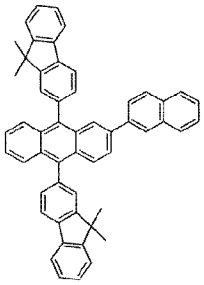
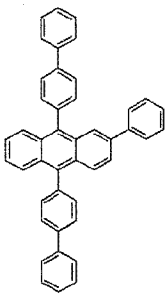
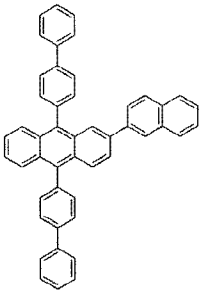
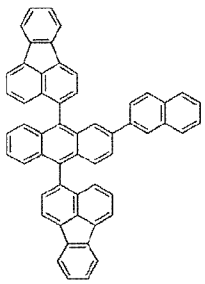
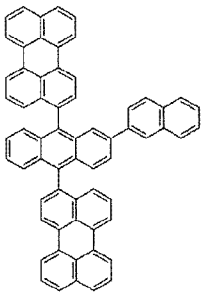
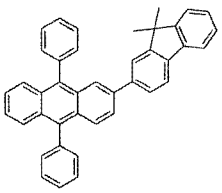
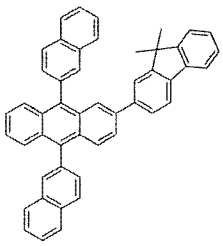
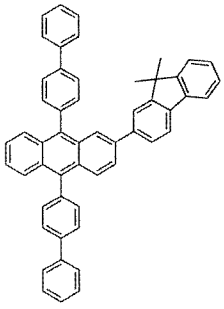
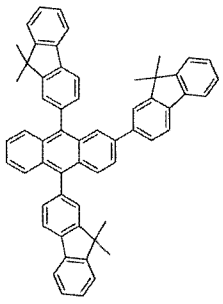




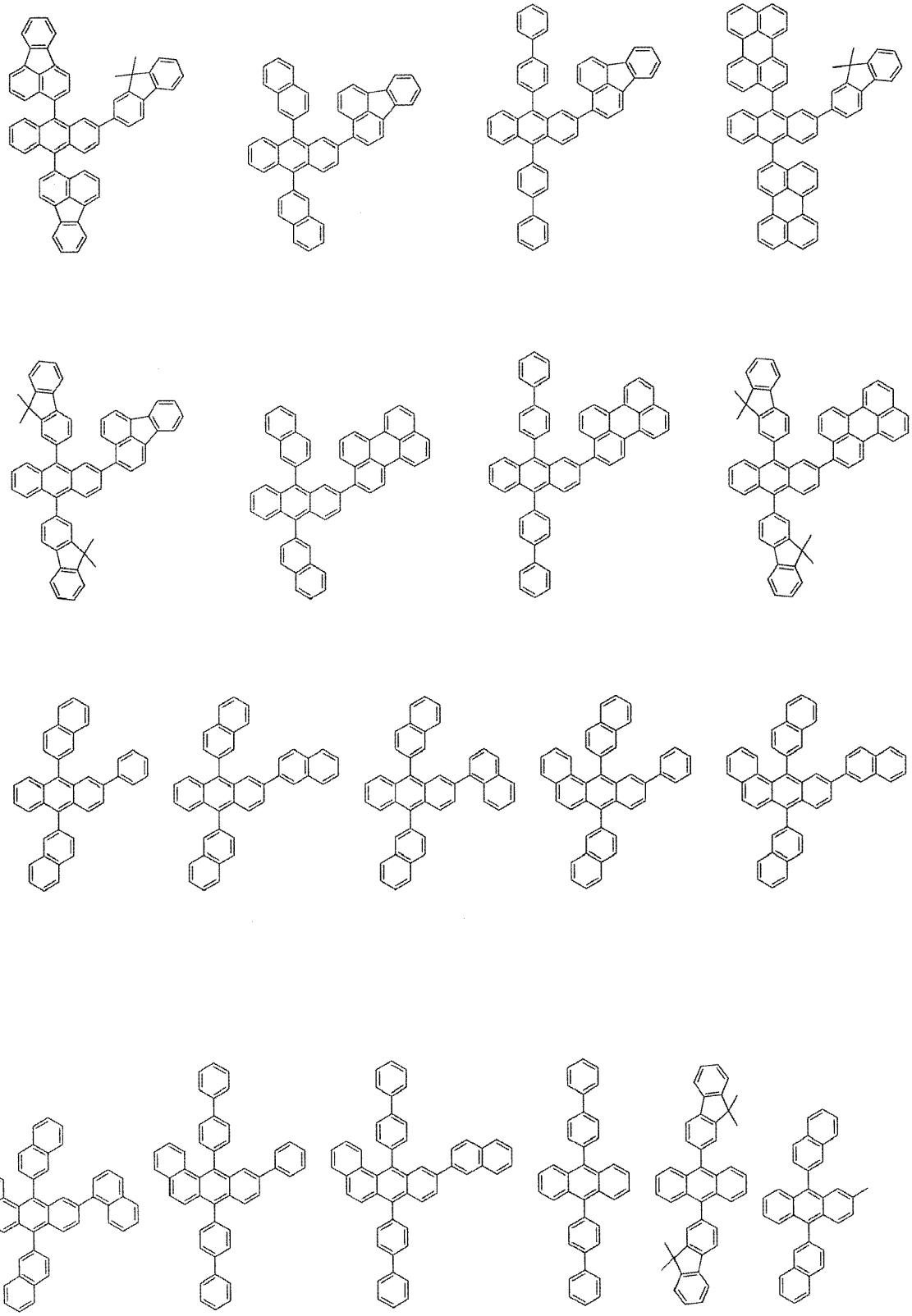















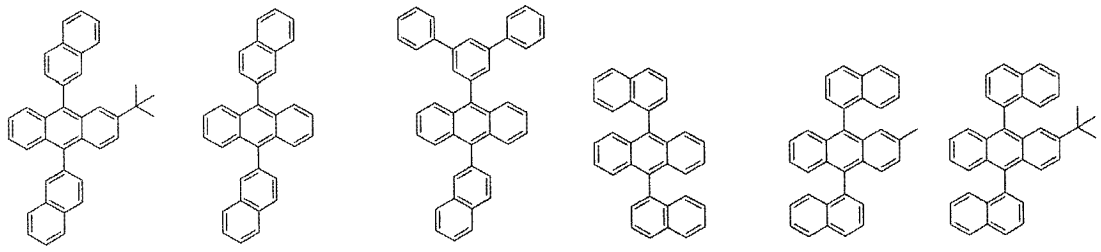


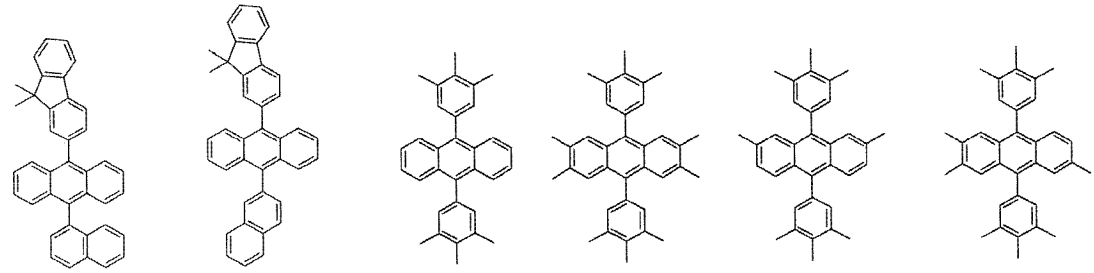


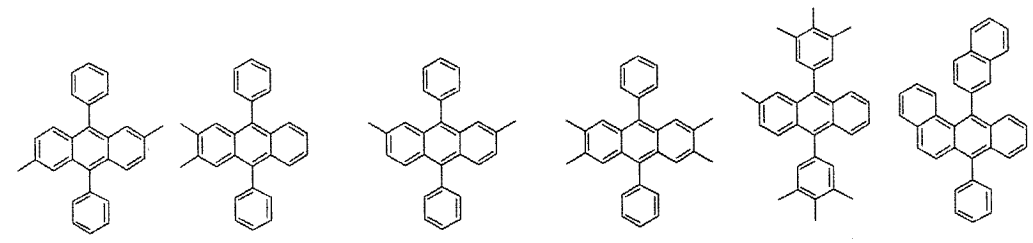


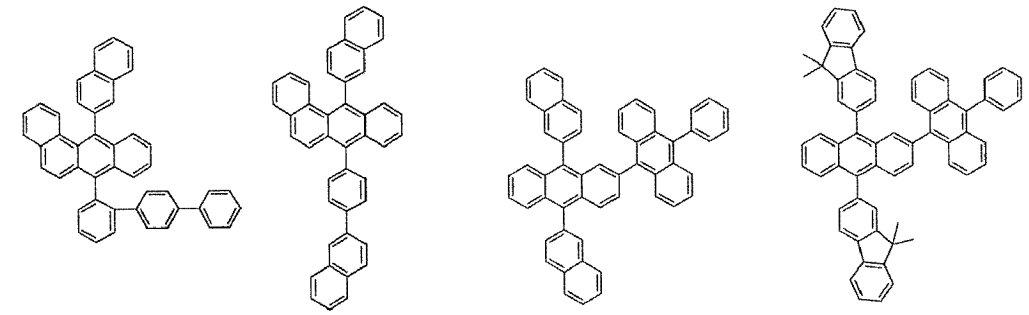



















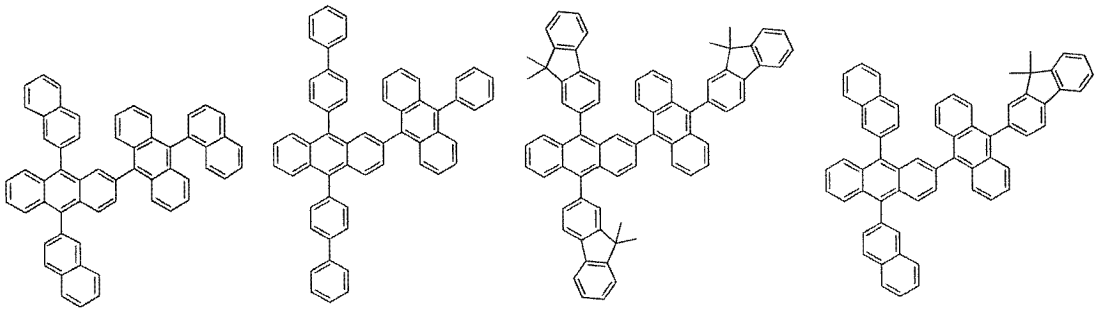


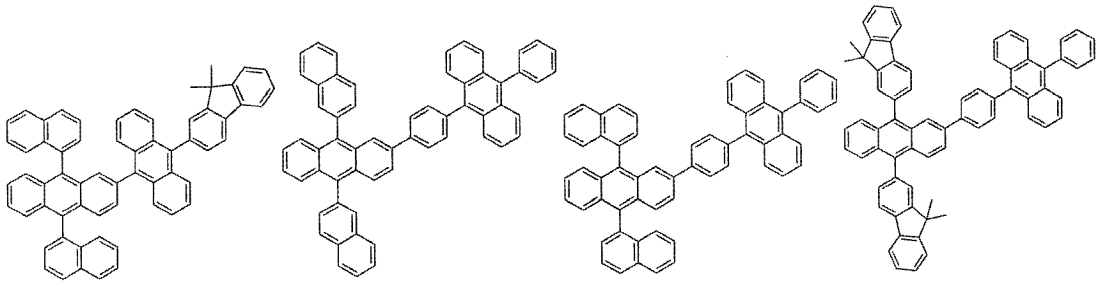


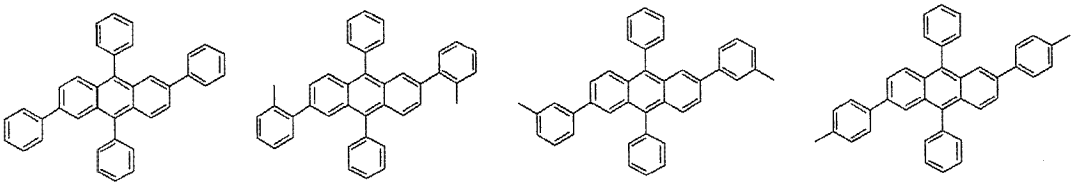


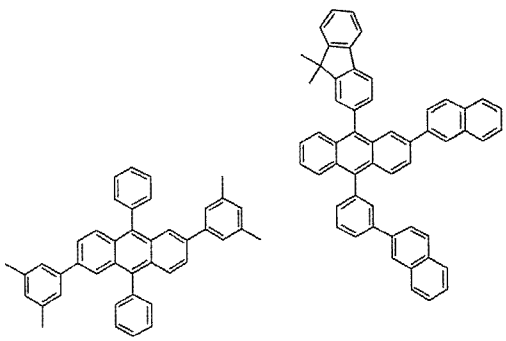


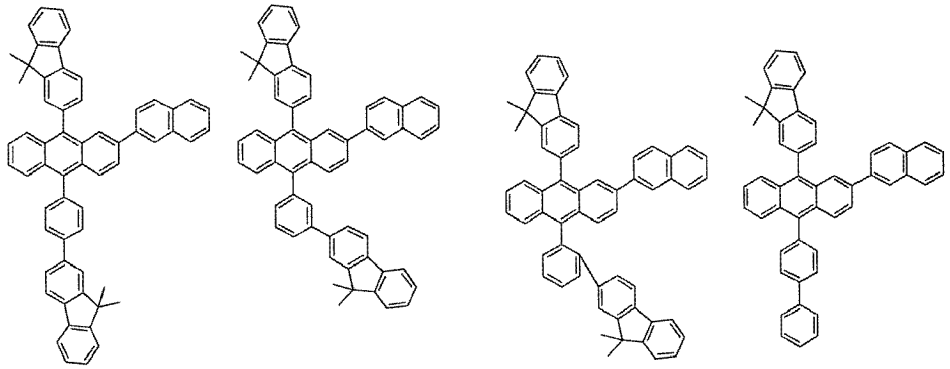


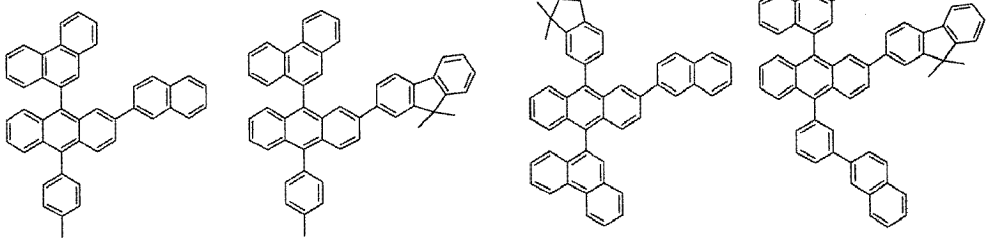


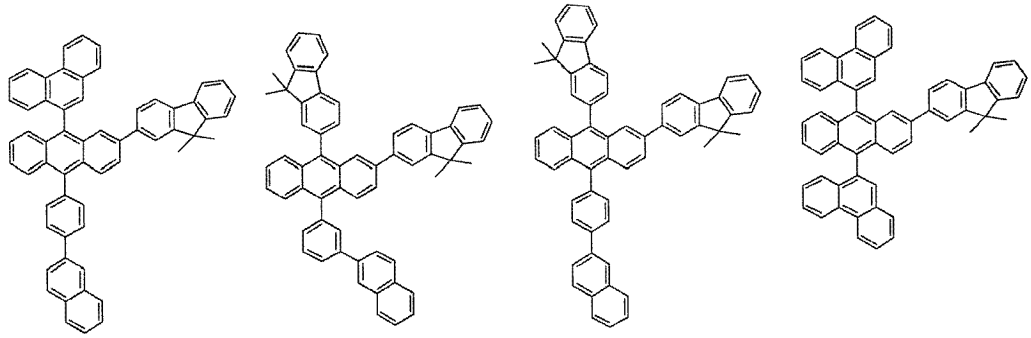


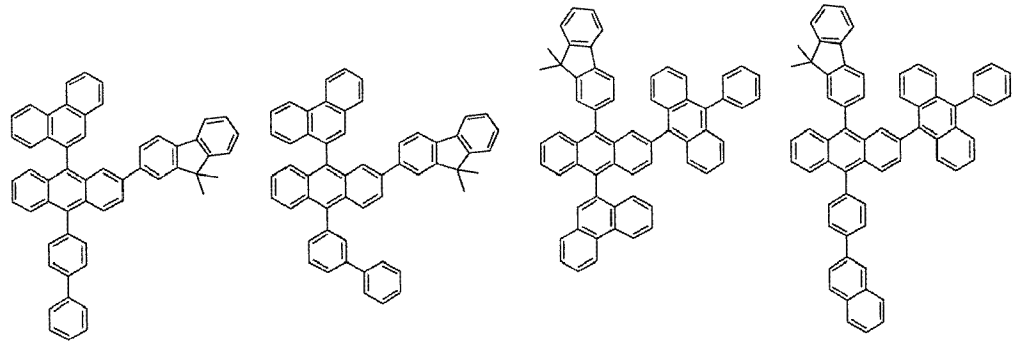


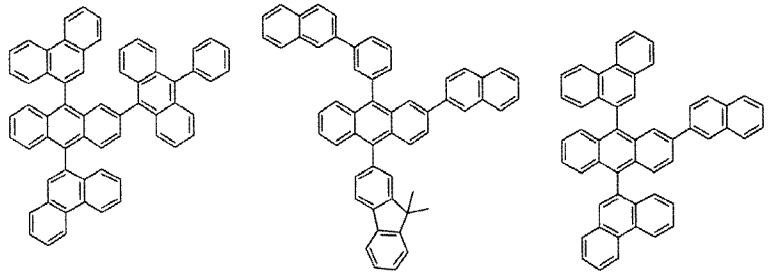


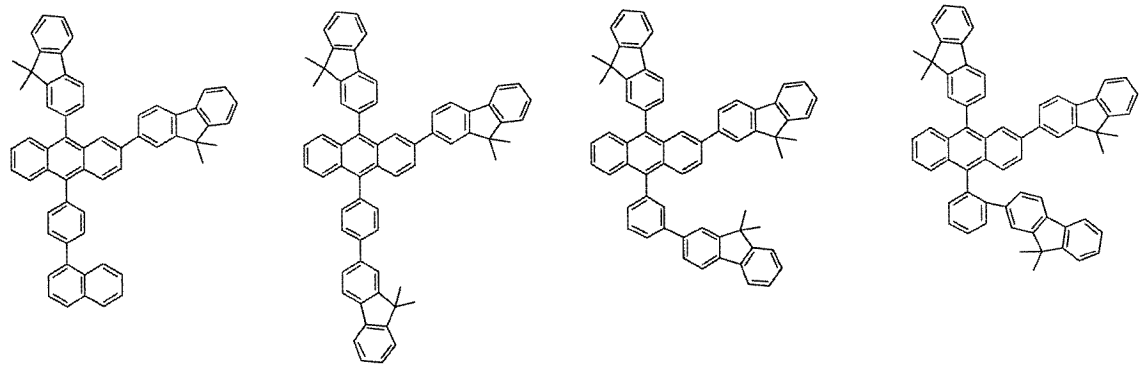


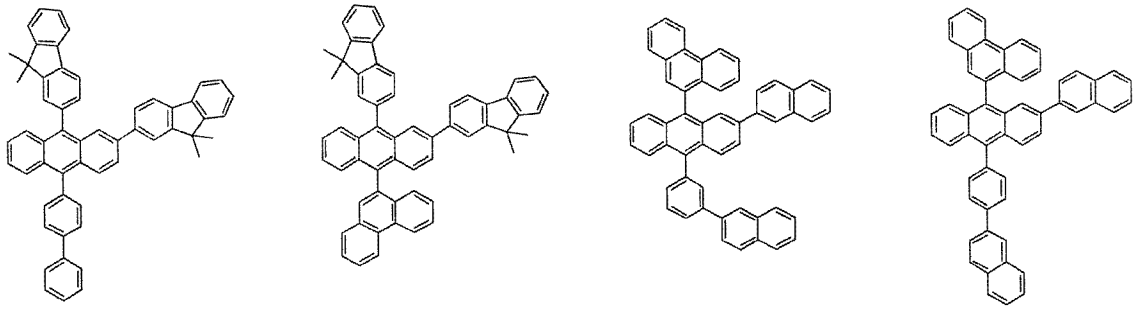


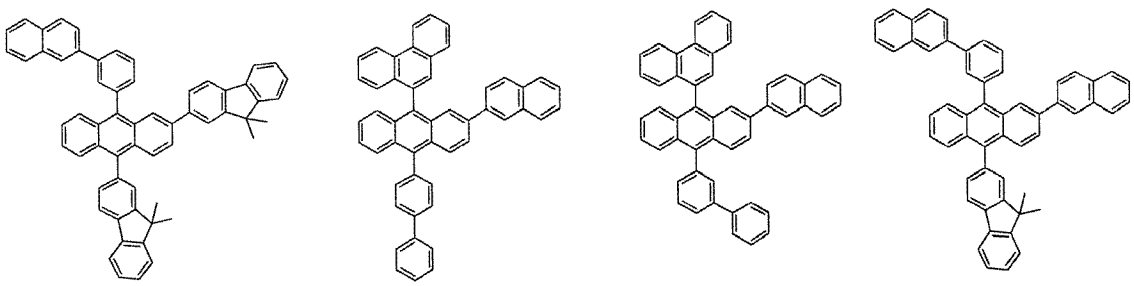


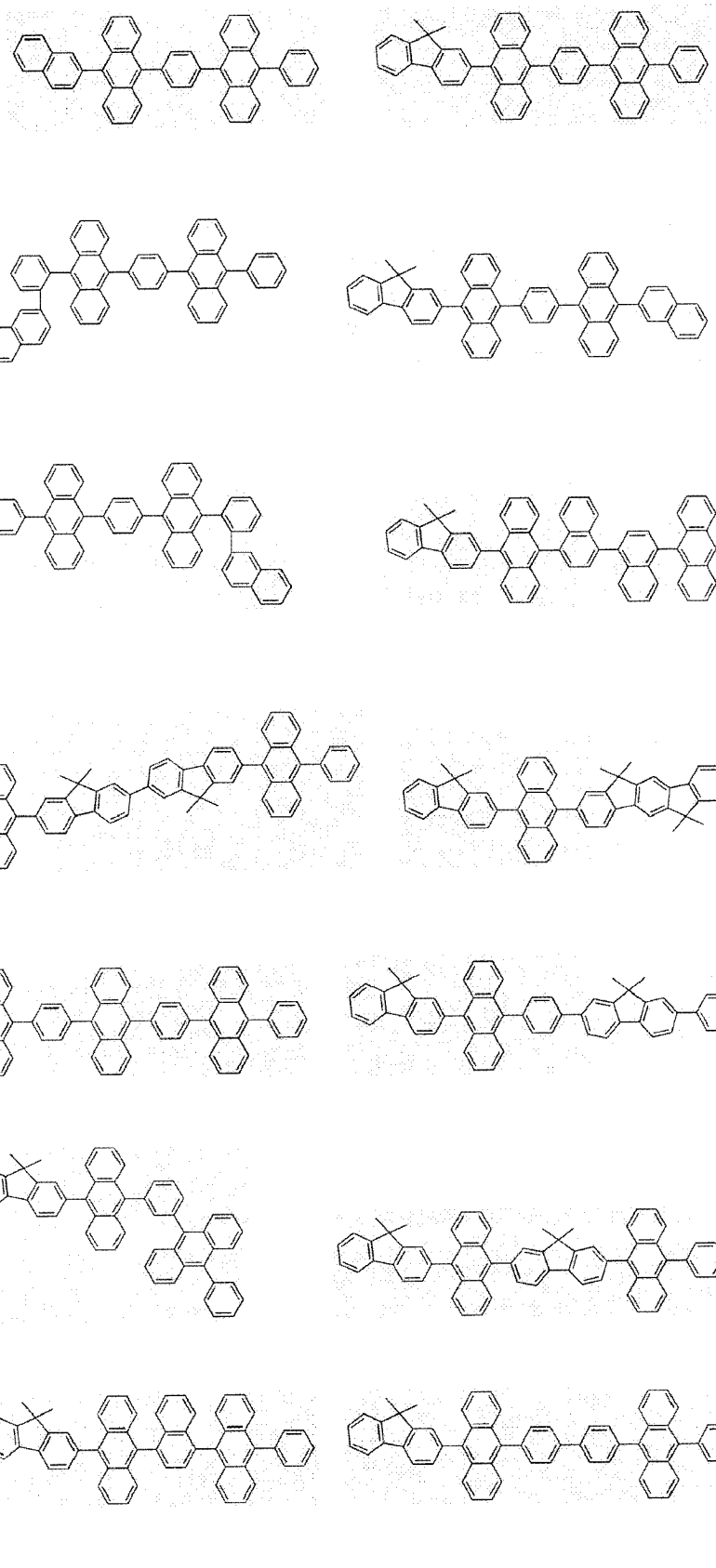


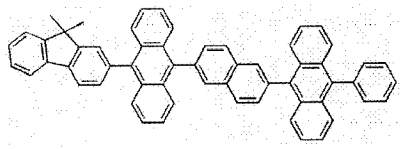
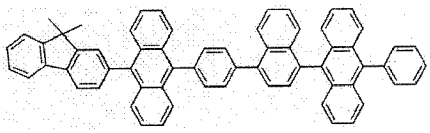
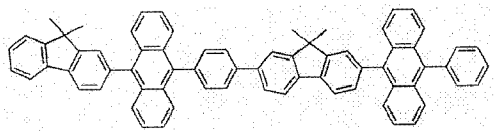
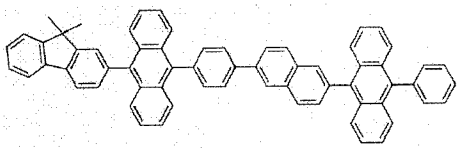
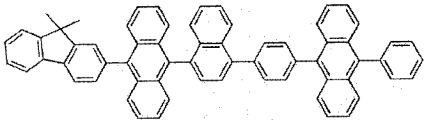
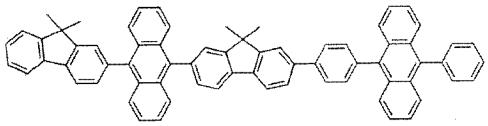
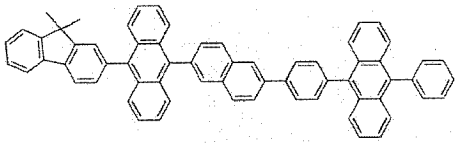
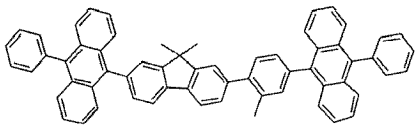
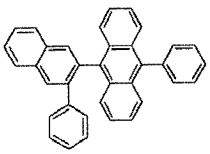
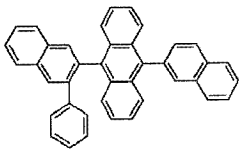
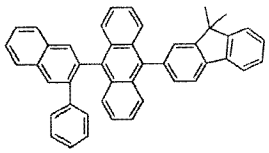
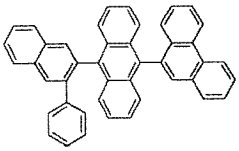
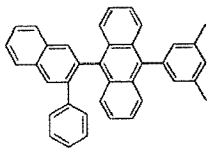
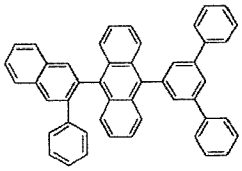
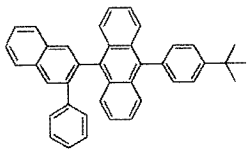
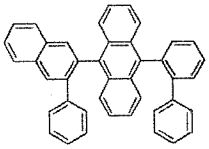
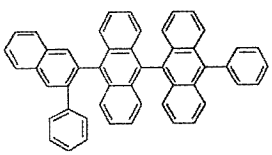
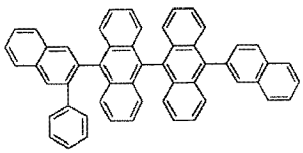
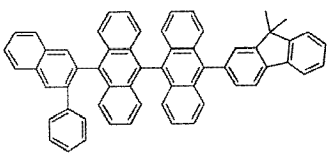


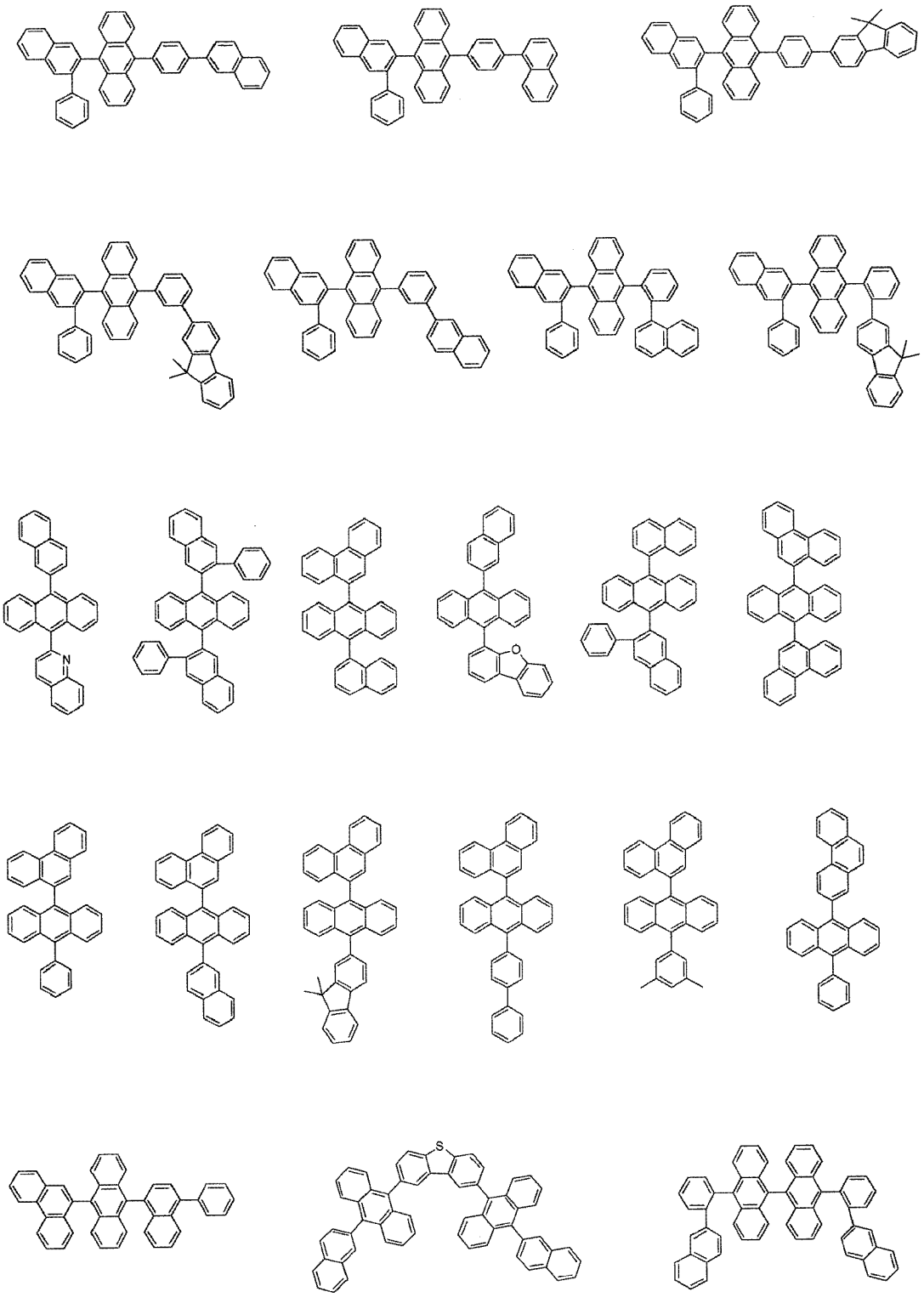






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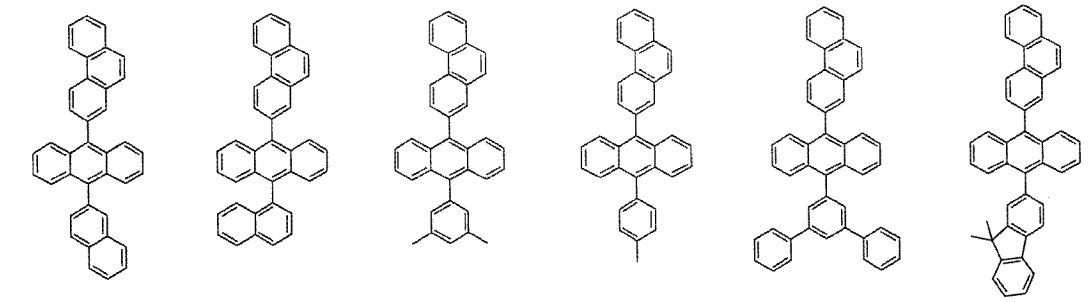
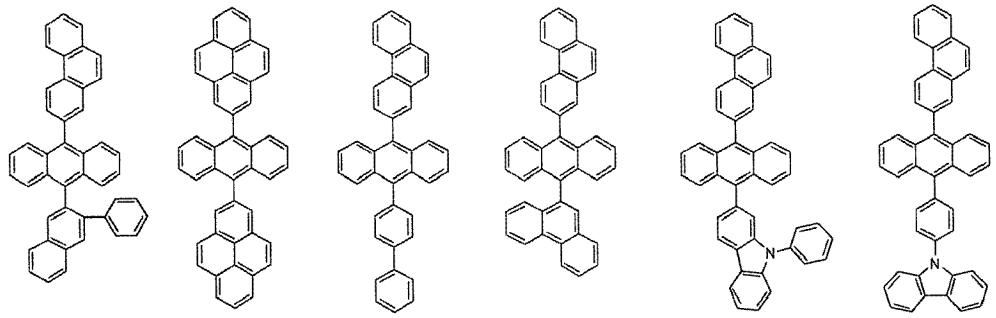




[0051] In an organic electroluminescent device according to the present invention, it is preferable to displace one or more layer(s) (here-in-below, referred to as the "surface layer") selected from chalcogenide layers, metal halide layers and metal oxide layers, on the inner surface of at least one side of the pair of electrodes. Specifically, it is preferable to arrange a chalcogenide layer of silicon and aluminum metal (including oxides) on the anode surface of the EL medium layer, and a metal halide layer or a metal oxide layer on the cathode surface of the EL medium layer. As the result, stability in operation can be obtained.

[0052] Examples of chalcogenides preferably include SiO_x ($1 \leq X \leq 2$), AlO_x ($1 \leq X \leq 1.5$), SiON, SiAlON, or the like. Examples of metal halides preferably include LiF, MgF_2, CaF_2, fluorides of rare-earth metals, or the like. Examples of metal oxides preferably include Cs_2O, Li_2O, MgO, SrO, BaO, CaO, or the like.

[0053] In an organic electroluminescent device according to the present invention, it is also preferable to arrange, on at least one surface of the pair of electrodes thus manufactured, a mixed region of electron transport compound and a reductive dopant, or a mixed region of a hole transport compound with an oxidative dopant. Accordingly, the electron transport compound is reduced to an anion, so that injection and transportation of electrons from the mixed region to an EL medium are facilitated. In addition, since the hole transport compound is oxidized to form a cation, injection and transportation of holes from the mixed region to an EL medium are facilitated. Preferable oxidative dopants include various Lewis acids and acceptor compounds. Preferable reductive dopants include alkali metals, alkali metal compounds, alkaline earth metals, rare-earth metals, and mixtures thereof.

[0054] The organic electroluminescent compounds according to the invention, having a backbone of more excellent EL properties and thermal stability than conventional phosphorescent materials, provide higher quantum efficiency and lower operation voltage as compared to conventional materials. Thus, if an organic electroluminescent compound according to the present invention is applied to an OLED panel, further enhanced results are anticipated in development of OLED's having medium to large size. If the compound is applied to an organic solar cell as a material of high efficiency, more excellent properties are anticipated as compared to conventional materials.

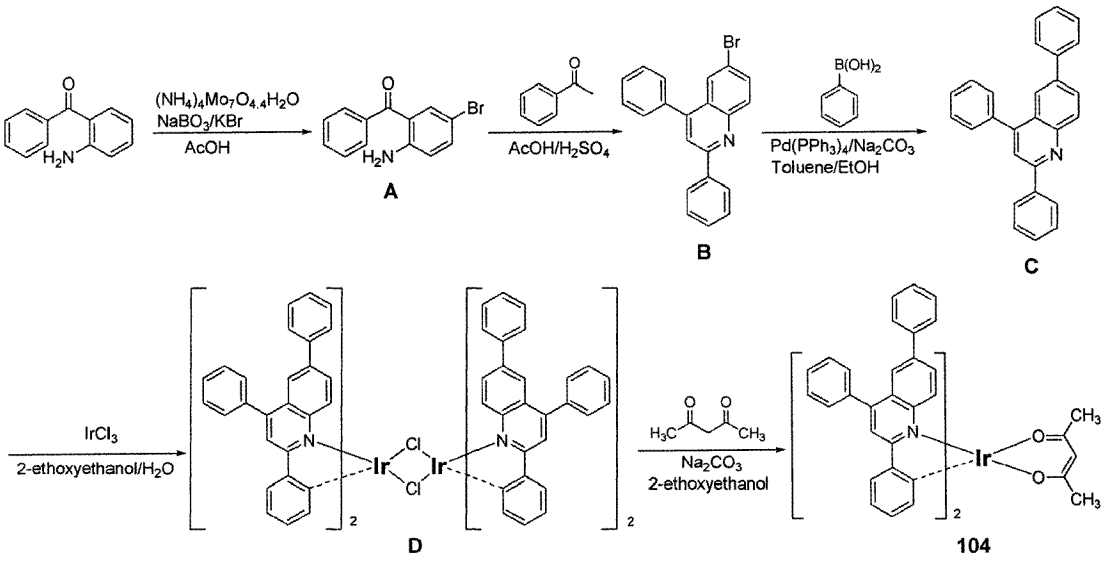
Best Mode

[0055] The present invention is further described with respect to the compounds according to the invention, the processes for preparing the same, and electroluminescent properties of devices manufactured therefrom by referring to the representative compounds of the invention, which are provided for illustration of the embodiments only but are not intended to limit the scope of the invention by any means.

Preparation Examples

[Preparation Example 1] Preparation of Compound (104)

[0056]



Preparation of Compound (A)

[0057] In glacial acetic acid (10 mL), dissolved was 2-aminobenzophenone (1.0 g, 5.1 mmol), and the solution was cooled to 0°C. Potassium bromide (0.7 g, 5.6 mmol), sodium borate hydrate (0.9 g, 6.1 mmol) and ammonium molibdate (0.06 g, 0.05 mmol) were added thereto, and the resultant mixture was stirred at 0°C for 1 hour, and then at room temperature for 2 hours. When the reaction was completed, ice water was added to generate solid, which was filtered and washed with water to obtain Compound (A) (1.4 g, 99%).

Preparation of Compound (B)

[0058] A reaction vessel was charged with Compound (A) (1.0 g, 3.6 mmol), acetophenone (0.4 mL, 3.3 mmol), glacial acetic acid (5 mL) and sulfuric acid (0.03 mL), and the mixture was stirred under reflux in the presence of argon gas atmosphere. When the reaction was completed, the reaction mixture was cooled to room temperature, and an excess amount of aqueous ammonium hydroxide solution was added. The solid produced was filtered and washed with distilled water. Purification via column chromatography gave Compound (B) (0.8 g, 65%).

Preparation of Compound (C)

[0059] In toluene (30 mL) and ethanol (15 mL), dissolved were Compound (B) (1.3 g, 3.6 mmol), phenylboronic acid (0.4 g, 3.6 mmol), and tetrakispalladium (0) triphenylphosphine ($Pd(PPh_3)_4$) (0.2 g, 0.14 mmol). After adding aqueous 2M sodium carbonate solution (18 mL) thereto, the resultant mixture was stirred at 120°C under reflux for 4 hours. Then, the mixture was cooled to 25°C, and distilled water (200 mL) was added to quench the reaction. The resultant mixture was extracted with ethyl acetate (300 mL), and the extract was dried under reduced pressure. Recrystallization from dichloromethane and methanol gave Compound (C) (0.8 g, 60%).

Preparation of Compound (D)

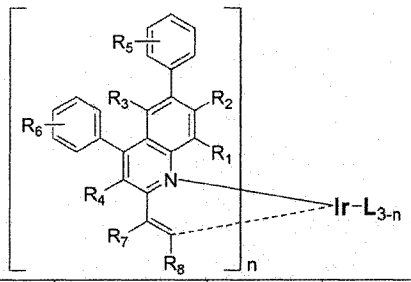
[0060] Compound (C) (0.8 g, 2.1 mmol) and iridium chloride ($IrCl_3$) (0.3 g, 1.0 mmol) were dissolved in 2-ethoxyethanol (12 mL) and distilled water (4 mL), and the mixture was heated under reflux for 24 hours. When the reaction was completed, the reaction mixture was cooled to room temperature, and the precipitate produced was filtered and dried to obtain Compound (D) (0.6 g, 61%).

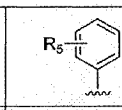
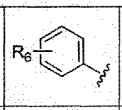
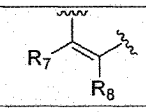
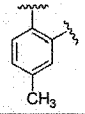
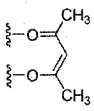
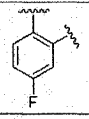
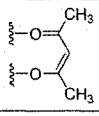
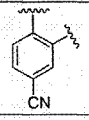
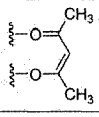
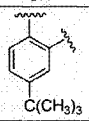
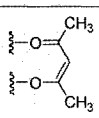
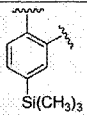
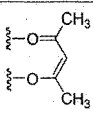
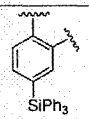
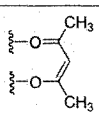
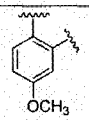
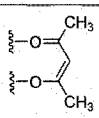
Preparation of Compound (104)

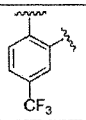
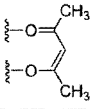
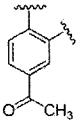
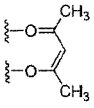
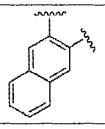
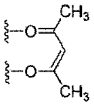
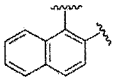
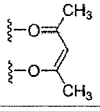
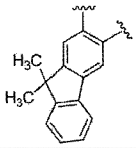
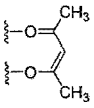
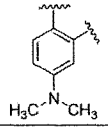
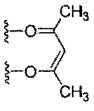
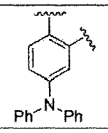
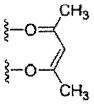
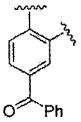
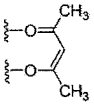
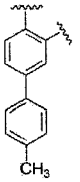
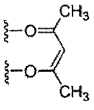
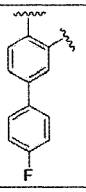
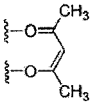
[0061] Compound (D) (0.6 g, 0.3 mmol), 2,4-pentanedione (0.1 mL, 0.9 mmol) and Na_2CO_3 (0.2 g, 1.8 mmol) were dissolved in 2-ethoxyethanol (10 mL), and the solution was heated for 4 hours. When the reaction was completed, the reaction mixture was cooled to room temperature, and the solid precipitate produced was filtered. Purification via silica gel column chromatography and recrystallization gave Compound (104) (0.4 g, 60%) as red crystal.

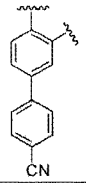
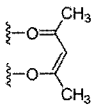
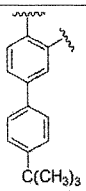
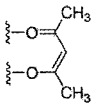
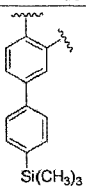
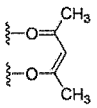
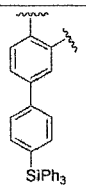
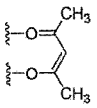
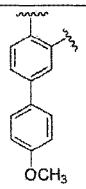
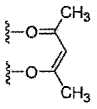
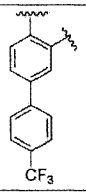
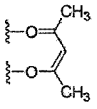
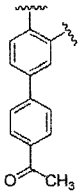
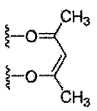
[0062] According to the same procedure as Preparation Example 1, organic electroluminescent compounds (Compound 1 through Compound 1017) in Table 1 were prepared, of which the ^1H NMR and MS/FAB data are listed in Table 2.

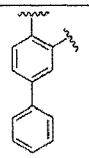
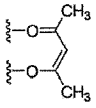
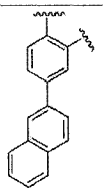
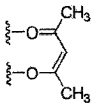
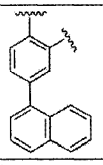
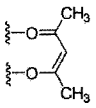
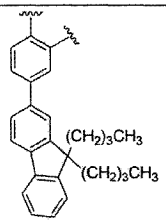
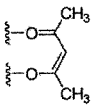
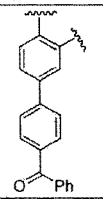
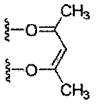
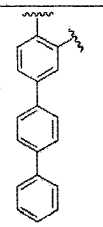
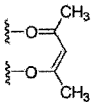
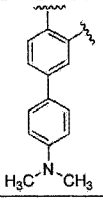
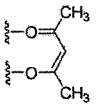
Table 1

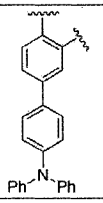
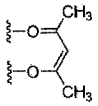
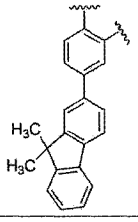
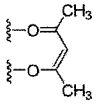
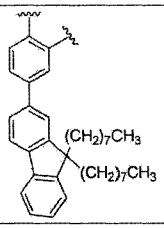
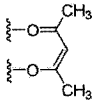
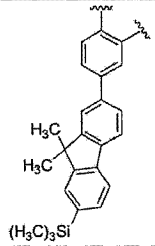
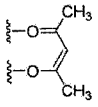
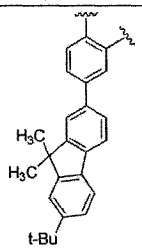
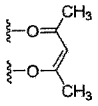
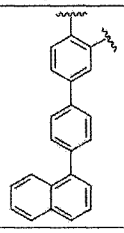
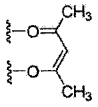


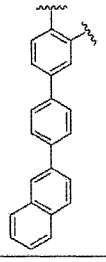
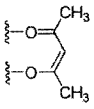
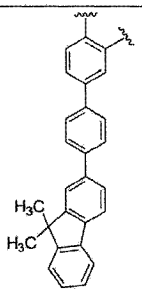
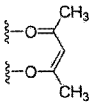
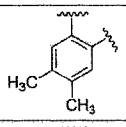
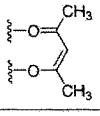
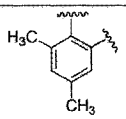
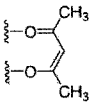
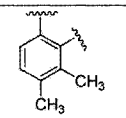
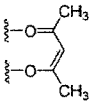
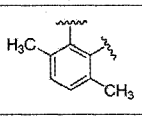
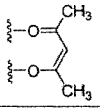
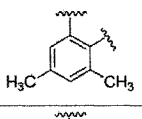
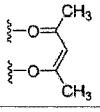
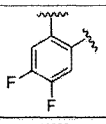
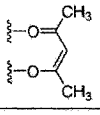
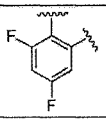
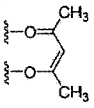
compound No.	R_1	R_2	R_3	R_4				L	n
1	H	H	H	H					2
2	H	H	H	H					2
3	H	H	H	H					2
4	H	H	H	H					2
5	H	H	H	H					2
6	H	H	H	H					2
7	H	H	H	H					2

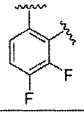
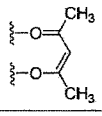
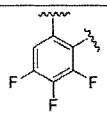
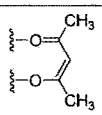
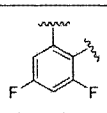
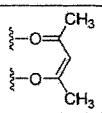
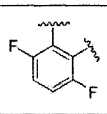
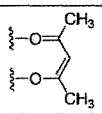
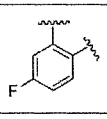
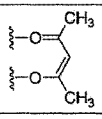
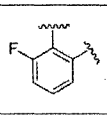
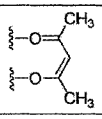
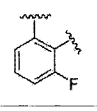
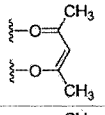
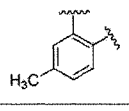
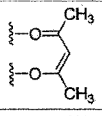
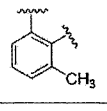
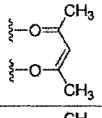
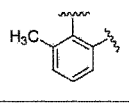
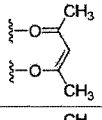
8	H	H	H	H					2
9	H	H	H	H					2
10	H	H	H	H					2
11	H	H	H	H					2
12	H	H	H	H					2
13	H	H	H	H					2
14	H	H	H	H					2
15	H	H	H	H					2
16	H	H	H	H					2
17	H	H	H	H					2

18	H	H	H	H					2
19	H	H	H	H					2
20	H	H	H	H					2
21	H	H	H	H					2
22	H	H	H	H					2
23	H	H	H	H					2
24	H	H	H	H					2

25	H	H	H	H					2
26	H	H	H	H					2
27	H	H	H	H					2
28	H	H	H	H					2
29	H	H	H	H					2
30	H	H	H	H					2
31	H	H	H	H					2

32	H	H	H	H					2
33	H	H	H	H					2
34	H	H	H	H					2
35	H	H	H	H					2
36	H	H	H	H					2
37	H	H	H	H					2

38	H	H	H	H					2
39	H	H	H	H					2
40	H	H	H	H					2
41	H	H	H	H					2
42	H	H	H	H					2
43	H	H	H	H					2
44	H	H	H	H					2
45	H	H	H	H					2
46	H	H	H	H					2

47	H	H	H	H					2
48	H	H	H	H					2
49	H	H	H	H					2
50	H	H	H	H					2
51	H	H	H	H					2
52	H	H	H	H					2
53	H	H	H	H					2
54	H	H	H	H					2
55	H	H	H	H					2
56	H	H	H	H					2
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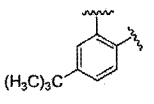
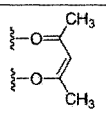
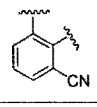
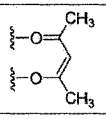
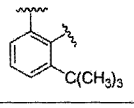
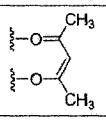
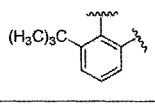
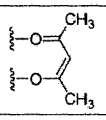
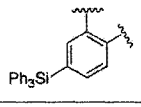
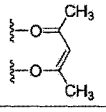
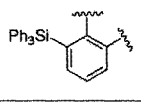
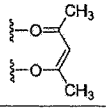
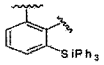
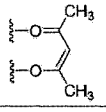
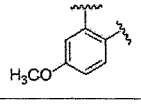
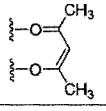
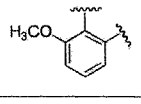
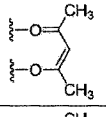
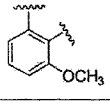
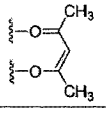
59	H	H	H	H					2
60	H	H	H	H					2
61	H	H	H	H					2
62	H	H	H	H					2
63	H	H	H	H					2
64	H	H	H	H					2
65	H	H	H	H					2
66	H	H	H	H					2
67	H	H	H	H					2
68	H	H	H	H					2
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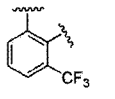
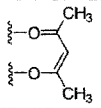
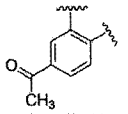
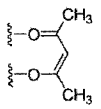
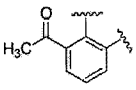
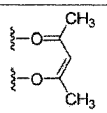
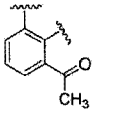
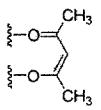
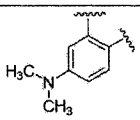
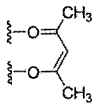
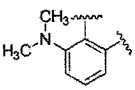
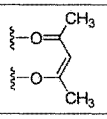
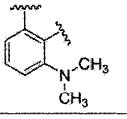
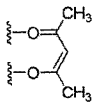
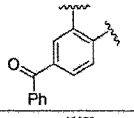
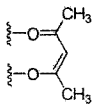
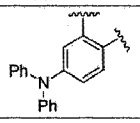
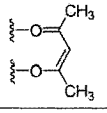
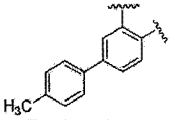
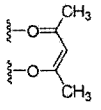
71	H	H	H	H					2
72	H	H	H	H					2
73	H	H	H	H					2
74	H	H	H	H					2
75	H	H	H	H					2
76	H	H	H	H					2
77	H	H	H	H					2
78	H	H	H	H					2
79	H	H	H	H					2
80	H	H	H	H					2
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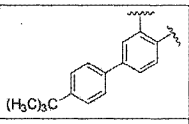
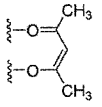
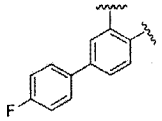
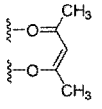
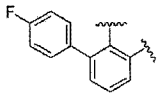
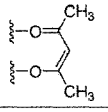
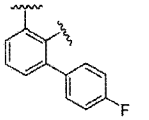
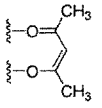
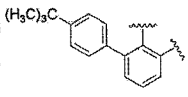
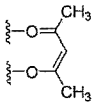
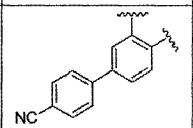
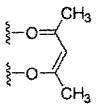
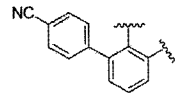
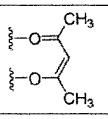
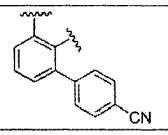
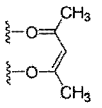
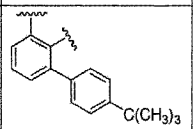
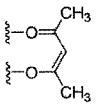
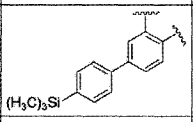
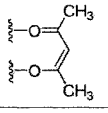
83	H	H	H	H					2
84	H	H	H	H					2
85	H	H	H	H					2
86	H	H	H	H					2
87	H	H	H	H					2
88	H	H	H	H					2
89	H	H	H	H					2
90	H	H	H	H					2
91	H	H	H	H					2
92	H	H	H	H					2
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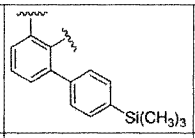
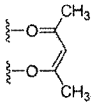
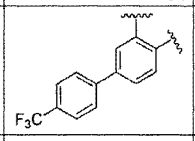
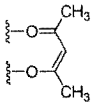
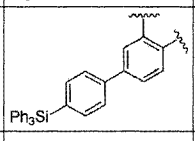
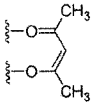
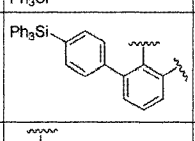
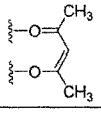
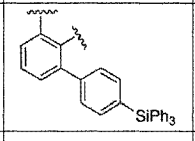
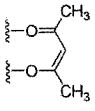
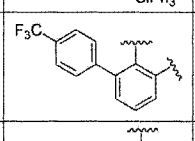
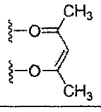
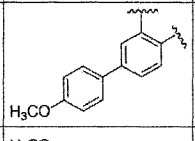
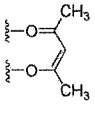
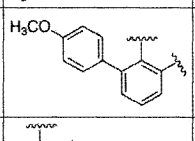
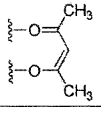
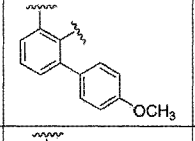
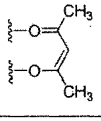
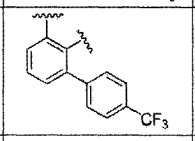
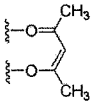
94	H	H	H	H					2
95	H	H	H	H					2
96	H	H	H	H					2
97	H	H	H	H					2
98	H	H	H	H					2
99	H	H	H	H					2
100	H	H	H	H					2
101	H	H	H	H					2
102	H	H	H	H					2
103	H	H	H	H					2
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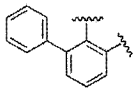
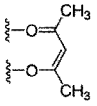
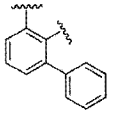
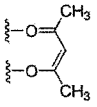
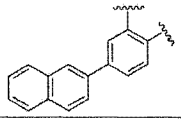
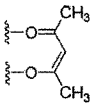
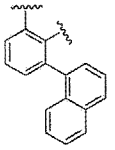
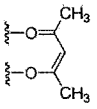
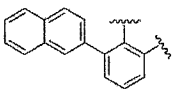
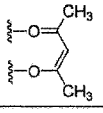
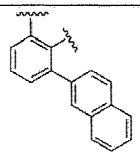
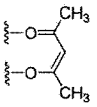
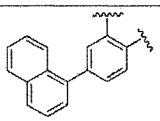
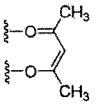
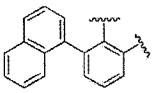
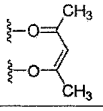
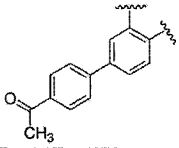
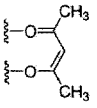
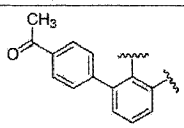
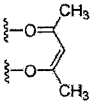
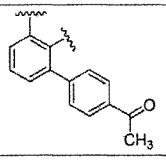
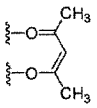
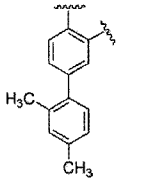
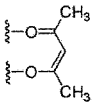
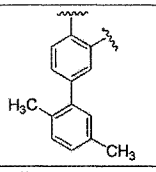
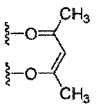
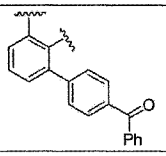
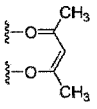
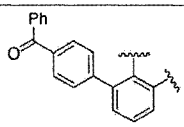
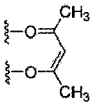
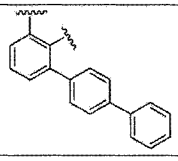
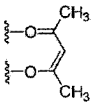
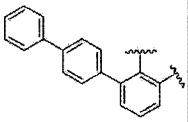
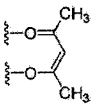
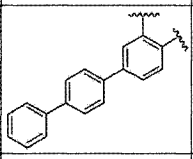
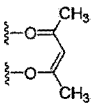
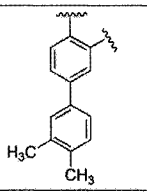
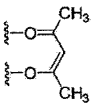
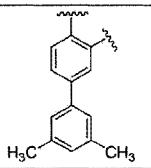
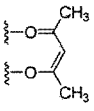
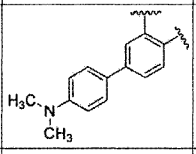
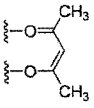
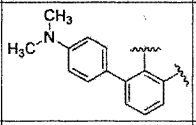
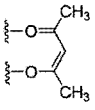
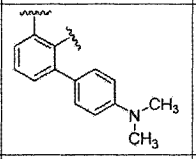
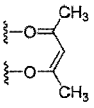
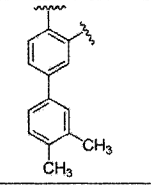
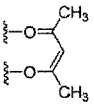
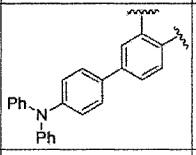
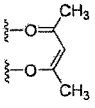
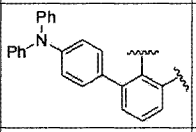
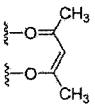
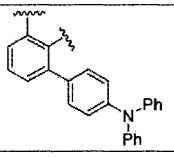
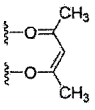
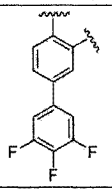
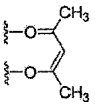
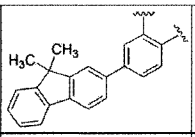
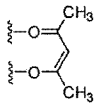
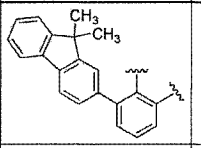
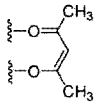
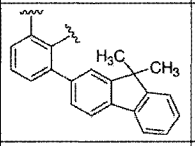
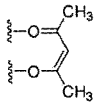
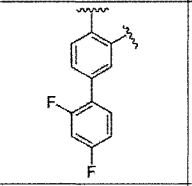
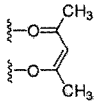
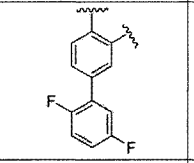
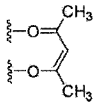
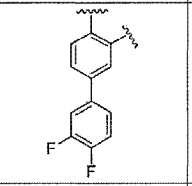
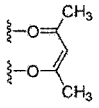
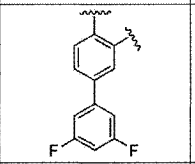
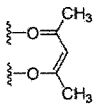
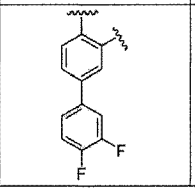
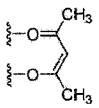
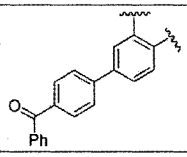
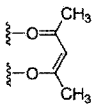
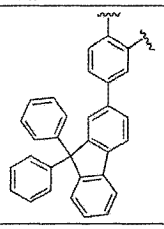
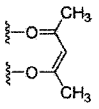
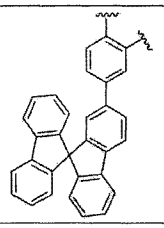
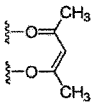
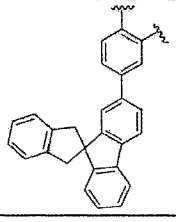
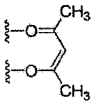
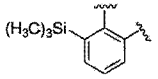
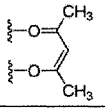
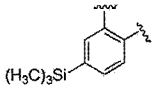
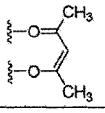
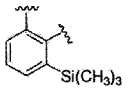
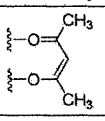
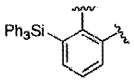
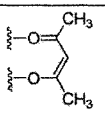
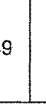
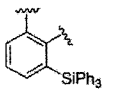
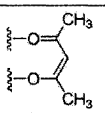
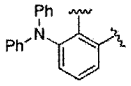
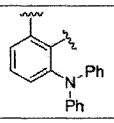
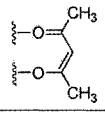
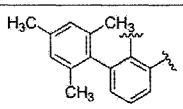
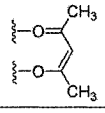
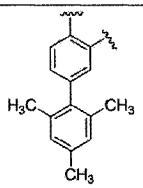
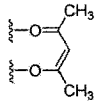
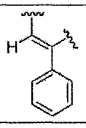
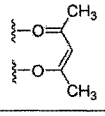
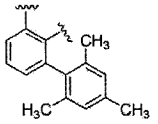
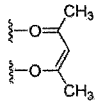
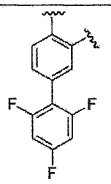
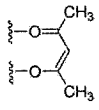
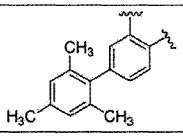
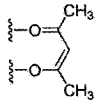
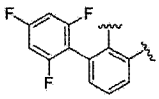
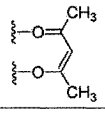
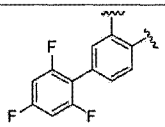
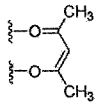
105	H	H	H	H					2
106	H	H	H	H					2
107	H	H	H	H					2
108	H	H	H	H					2
109	H	H	H	H					2
110	H	H	H	H					2
111	H	H	H	H					2
112	H	H	H	H					2
113	H	H	H	H					2
114	H	H	H	H					2

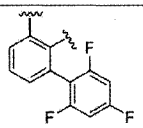
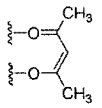
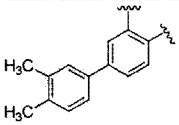
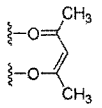
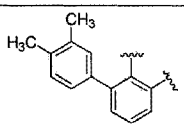
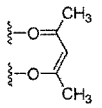
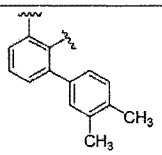
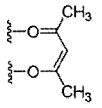
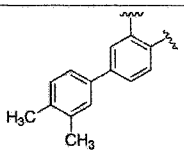
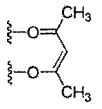
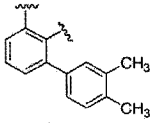
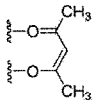
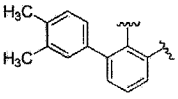
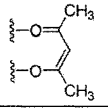
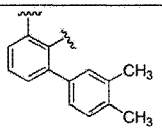
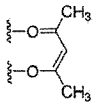
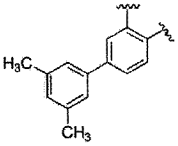
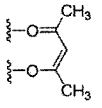
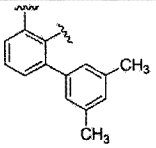
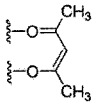
115	H	H	H	H					2
116	H	H	H	H					2
117	H	H	H	H					2
118	H	H	H	H					2
119	H	H	H	H					2
120	H	H	H	H					2
121	H	H	H	H					2
122	H	H	H	H					2
123	H	H	H	H					2

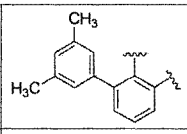
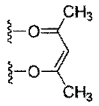
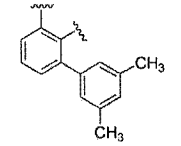
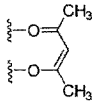
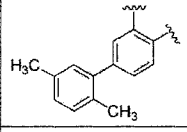
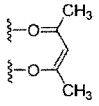
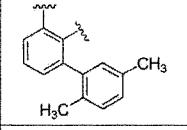
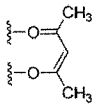
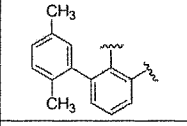
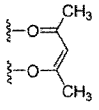
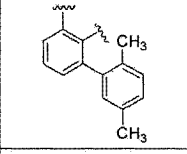
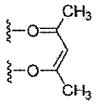
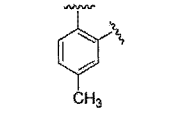
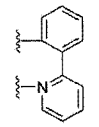
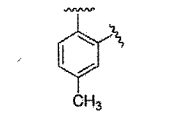
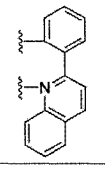
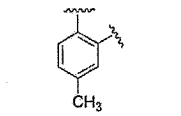
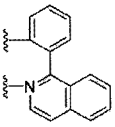
124	H	H	H	H					2
125	H	H	H	H					2
126	H	H	H	H					2
127	H	H	H	H					2
128	H	H	H	H					2
129	H	H	H	H					2
130	H	H	H	H					2
131	H	H	H	H					2
132	H	H	H	H					2

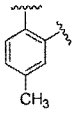
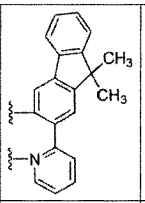
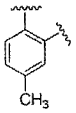
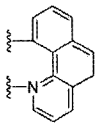
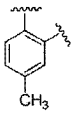
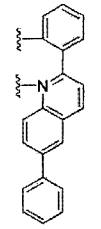
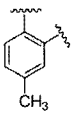
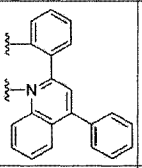
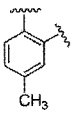
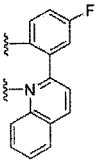
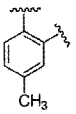
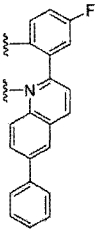
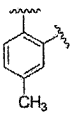
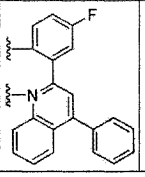
133	H	H	H	H					2
134	H	H	H	H					2
135	H	H	H	H					2
136	H	H	H	H					2
137	H	H	H	H					2
138	H	H	H	H					2
139	H	H	H	H					2
140	H	H	H	H					2

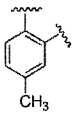
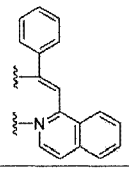
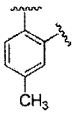
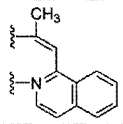
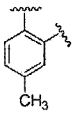
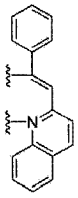
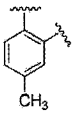
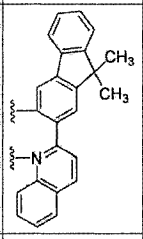
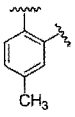
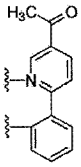
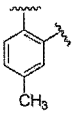
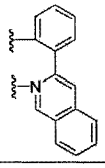
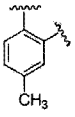
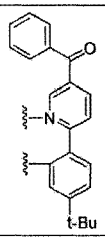
141	H	H	H	H					2
142	H	H	H	H					2
143	H	H	H	H					2
144	H	H	H	H					2
145	H	H	H	H					2
146	H	H	H	H					2
147	H	H	H	H					2
148	H	H	H	H					2
149	H	H	H	H					2

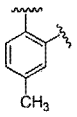
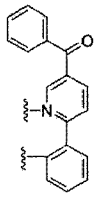
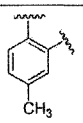
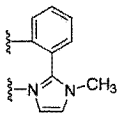
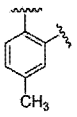
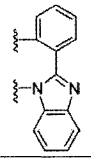
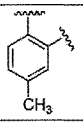
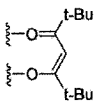
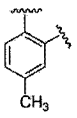
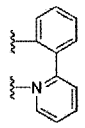
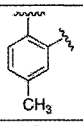
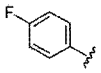
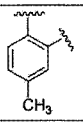
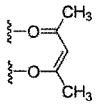
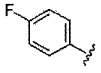
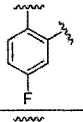
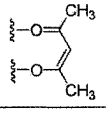
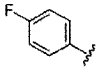
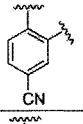
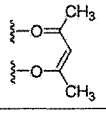
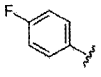
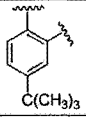
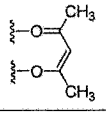
150	H	H	H	H					2
151	H	H	H	H					2
152	H	H	H	H					2
153	H	H	H	H					2
154	H	H	H	H					2
155	H	H	H	H					2
156	H	H	H	H					2
157	H	H	H	H					2
158	H	H	H	H					2
159	H	H	H	H					2

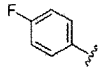
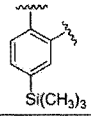
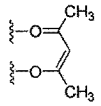
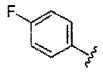
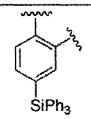
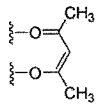
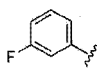
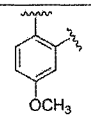
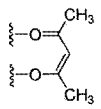
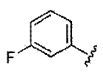
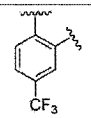
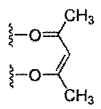
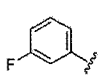
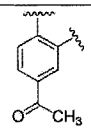
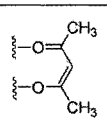
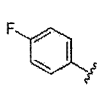
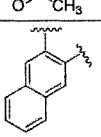
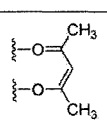
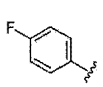
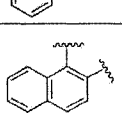
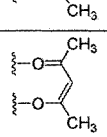
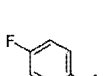
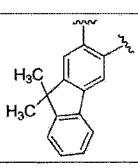
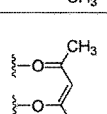
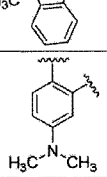
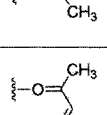
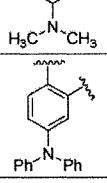
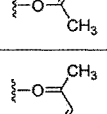
160	H	H	H	H					2
161	H	H	H	H					2
162	H	H	H	H					2
163	H	H	H	H					2
164	H	H	H	H					2
165	H	H	H	H					2
166	H	H	H	H					2
167	H	H	H	H					2
168	H	H	H	H					2
169	H	H	H	H					2

170	H	H	H	H					2
171	H	H	H	H					2
172	H	H	H	H					2
173	H	H	H	H					2
174	H	H	H	H					2
175	H	H	H	H					2
176	H	H	H	H					2
177	H	H	H	H					2
178	H	H	H	H					2

179	H	H	H	H					2
180	H	H	H	H					2
181	H	H	H	H					2
182	H	H	H	H					2
183	H	H	H	H					2
184	H	H	H	H					2
185	H	H	H	H					2

186	H	H	H	H					2
187	H	H	H	H					2
188	H	H	H	H					2
189	H	H	H	H					2
190	H	H	H	H					2
191	H	H	H	H					2
192	H	H	H	H					2

193	H	H	H	H					2
194	H	H	H	H					2
195	H	H	H	H					2
196	H	H	H	H					2
197	H	H	H	H					1
198	H	H	H	H				-	3
199	H	H	H	H					2
200	H	H	H	H					2
201	H	H	H	H					2
202	H	H	H	H					2

203	H	H	H	H					2
204	H	H	H	H					2
205	H	H	H	H					2
206	H	H	H	H					2
207	H	H	H	H					2
208	H	H	H	H					2
209	H	H	H	H					2
210	H	H	H	H					2
211	H	H	H	H					2
212	H	H	H	H					2
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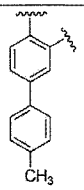
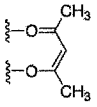
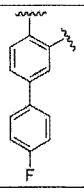
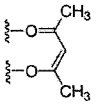
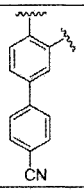
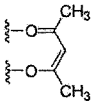
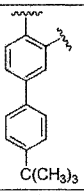
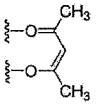
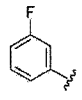
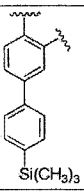
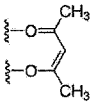
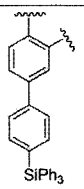
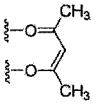
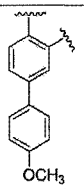
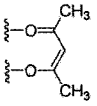
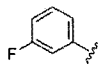
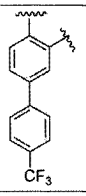
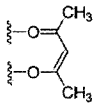
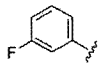
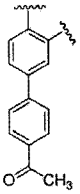
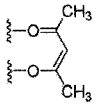
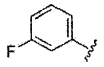
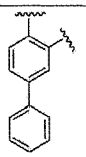
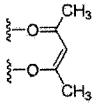
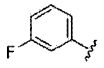
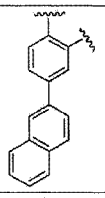
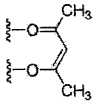
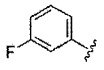
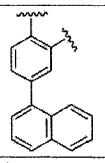
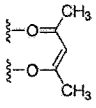
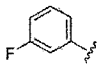
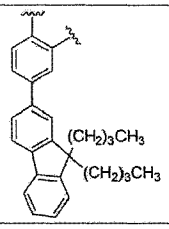
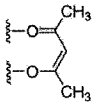
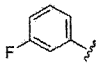
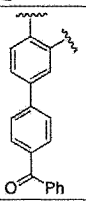
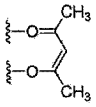
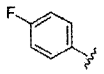
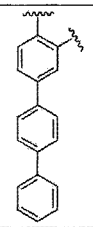
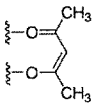
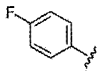
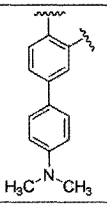
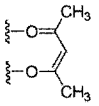
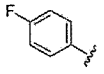
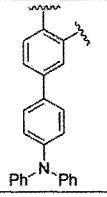
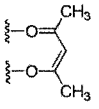
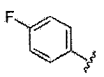
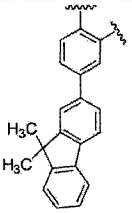
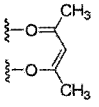
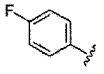
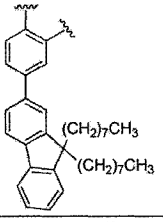
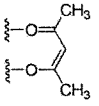
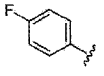
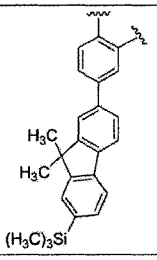
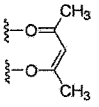
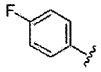
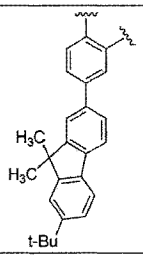
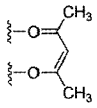
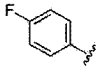
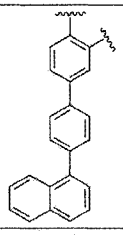
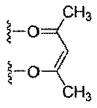
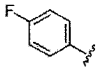
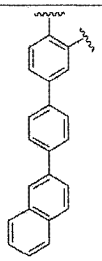
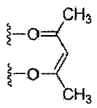
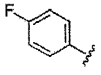
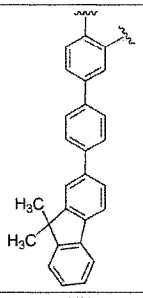
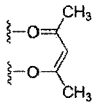
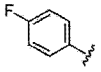
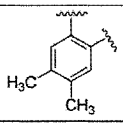
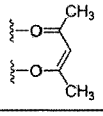
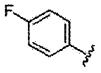
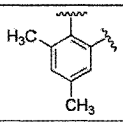
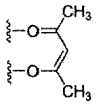
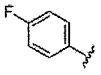
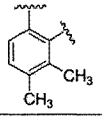
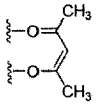
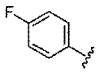
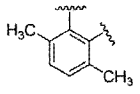
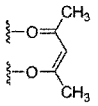
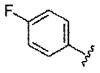
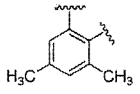
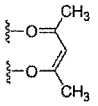
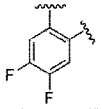
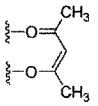
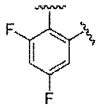
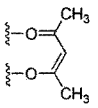
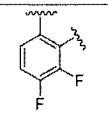
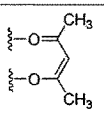
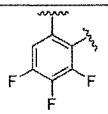
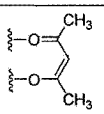
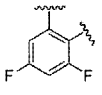
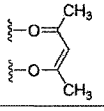
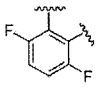
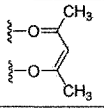
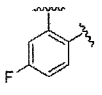
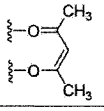
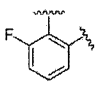
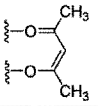
214	H	H	H	H					2
215	H	H	H	H					2
216	H	H	H	H					2
217	H	H	H	H					2
218	H	H	H	H					2
219	H	H	H	H					2
220	H	H	H	H					2

221	H	H	H	H					2
222	H	H	H	H					2
223	H	H	H	H					2
224	H	H	H	H					2
225	H	H	H	H					2
226	H	H	H	H					2
227	H	H	H	H					2

228	H	H	H	H					2
229	H	H	H	H					2
230	H	H	H	H					2
231	H	H	H	H					2
232	H	H	H	H					2
233	H	H	H	H					2

234	H	H	H	H					2
235	H	H	H	H					2
236	H	H	H	H					2
237	H	H	H	H					2
238	H	H	H	H					2
239	H	H	H	H					2
240	H	H	H	H					2

241	H	H	H	H					2
242	H	H	H	H					2
243	H	H	H	H					2
244	H	H	H	H					2
245	H	H	H	H					2
246	H	H	H	H					2
247	H	H	H	H					2
248	H	H	H	H					2
249	H	H	H	H					2
250	H	H	H	H					2
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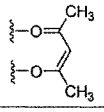
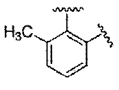
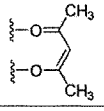
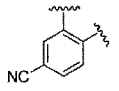
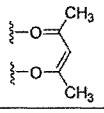
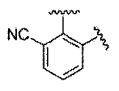
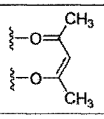
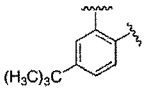
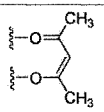
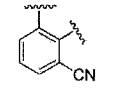
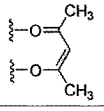
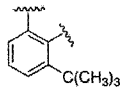
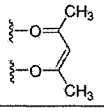
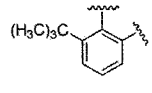
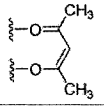
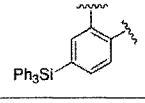
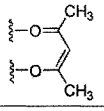
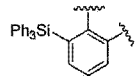
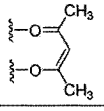
253	H	H	H	H					2
254	H	H	H	H					2
255	H	H	H	H					2
256	H	H	H	H					2
257	H	H	H	H					2
258	H	H	H	H					2
259	H	H	H	H					2
260	H	H	H	H					2
261	H	H	H	H					2
262	H	H	H	H					2
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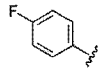
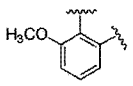
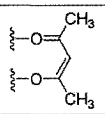
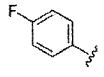
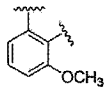
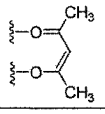
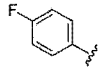
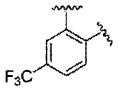
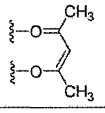
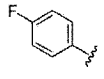
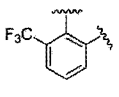
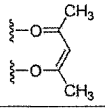
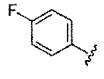
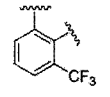
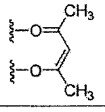
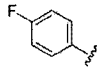
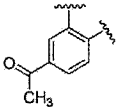
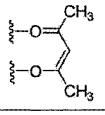
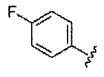
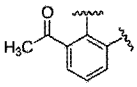
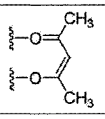
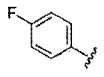
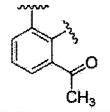
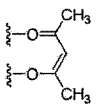
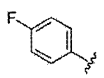
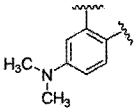
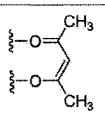
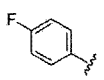
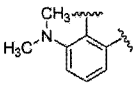
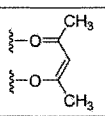
265	H	H	H	H					2
266	H	H	H	H					2
267	H	H	H	H					2
268	H	H	H	H					2
269	H	H	H	H					2
270	H	H	H	H					2
271	H	H	H	H					2
272	H	H	H	H					2
273	H	H	H	H					2
274	H	H	H	H					2
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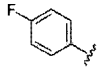
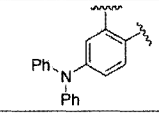
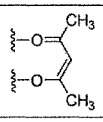
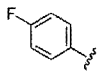
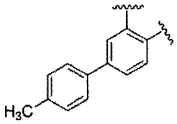
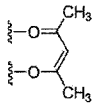
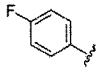
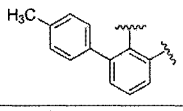
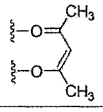
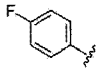
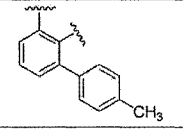
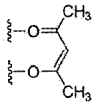
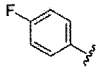
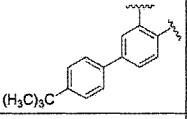
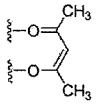
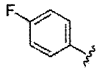
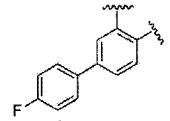
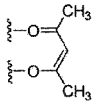
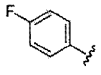
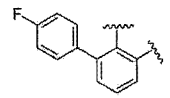
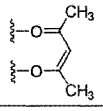
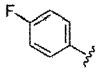
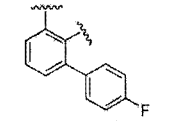
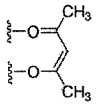
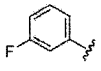
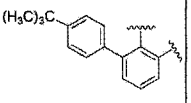
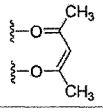
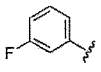
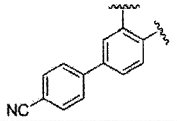
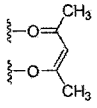
277	H	H	H	H					2
278	H	H	H	H					2
279	H	H	H	H					2
280	H	H	H	H					2
281	H	H	H	H					2
282	H	H	H	H					2
283	H	H	H	H					2
284	H	H	H	H					2
285	H	H	H	H					2
286	H	H	H	H					2
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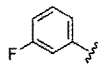
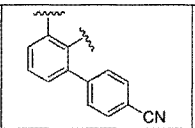
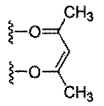
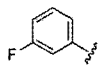
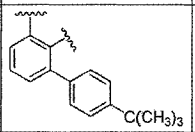
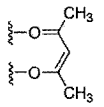
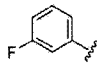
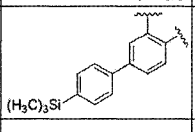
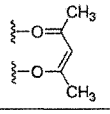
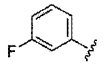
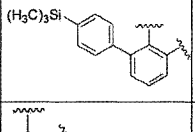
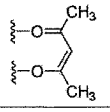
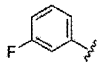
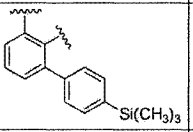
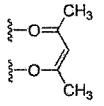
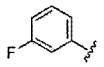
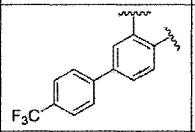
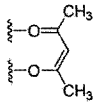
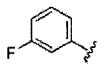
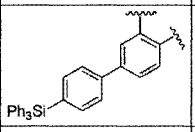
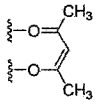
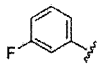
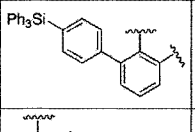
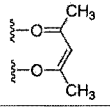
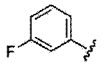
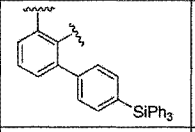
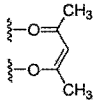
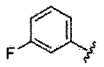
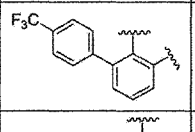
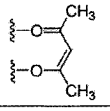
288	H	H	H	H					2
289	H	H	H	H					2
290	H	H	H	H					2
291	H	H	H	H					2
292	H	H	H	H					2
293	H	H	H	H					2
294	H	H	H	H					2
295	H	H	H	H					2
296	H	H	H	H					2
297	H	H	H	H					2
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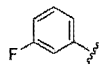
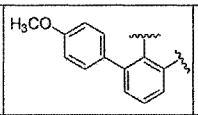
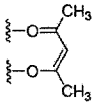
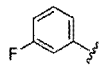
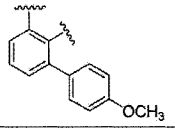
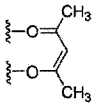
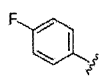
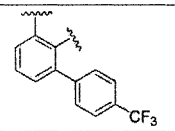
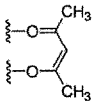
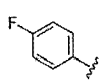
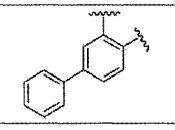
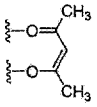
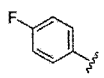
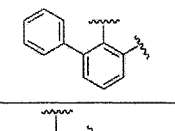
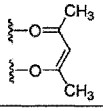
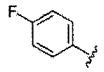
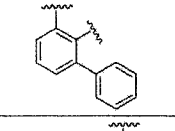
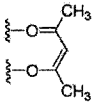
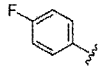
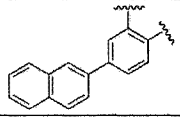
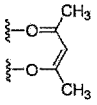
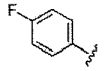
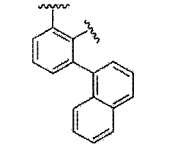
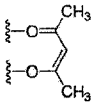
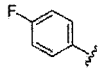
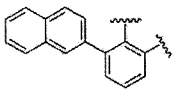
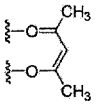
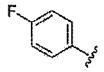
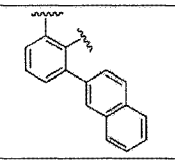
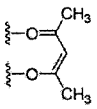
299	H	H	H	H					2
300	H	H	H	H					2
301	H	H	H	H					2
302	H	H	H	H					2
303	H	H	H	H					2
304	H	H	H	H					2
305	H	H	H	H					2
306	H	H	H	H					2
307	H	H	H	H					2
308	H	H	H	H					2
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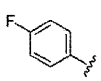
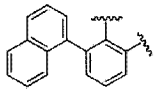
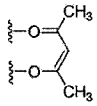
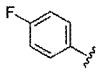
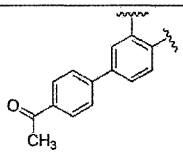
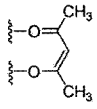
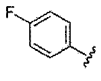
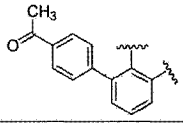
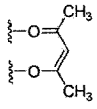
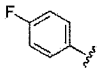
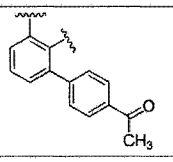
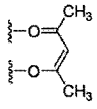
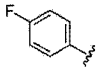
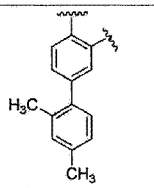
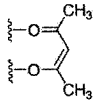
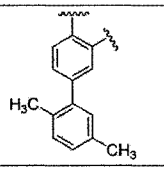
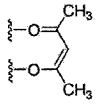
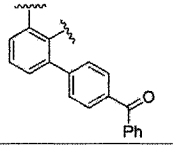
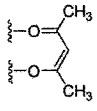
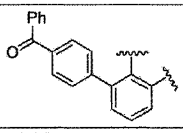
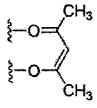
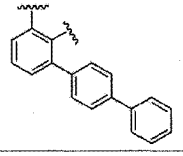
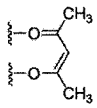
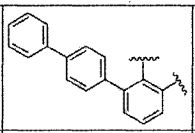
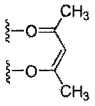
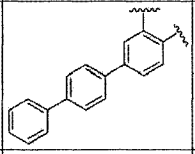
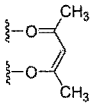
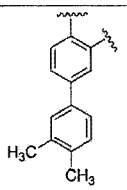
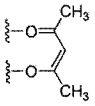
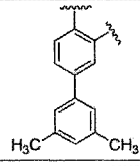
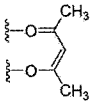
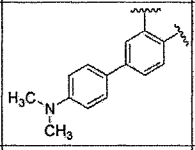
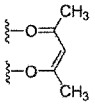
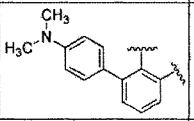
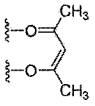
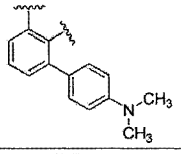
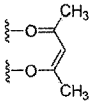
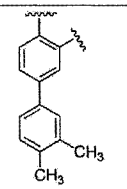
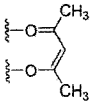
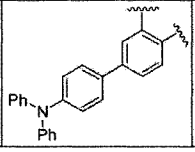
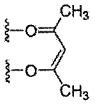
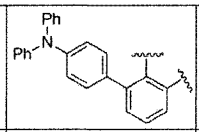
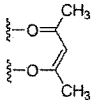
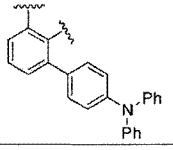
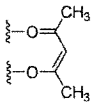
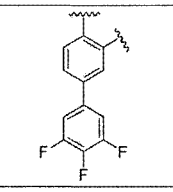
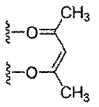
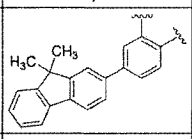
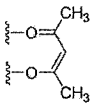
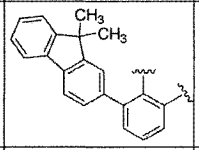
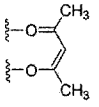
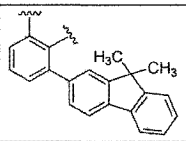
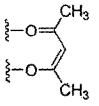
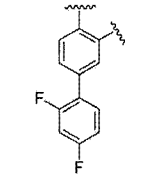
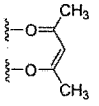
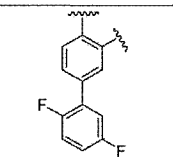
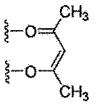
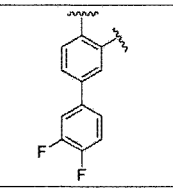
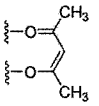
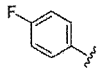
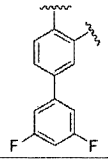
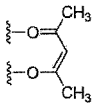
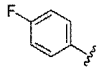
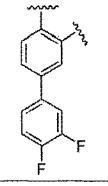
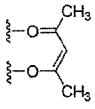
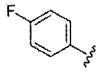
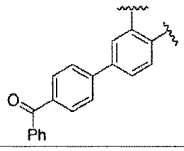
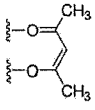
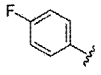
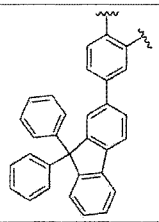
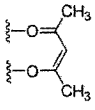
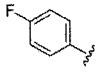
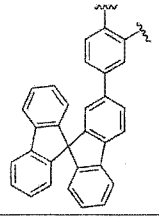
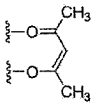
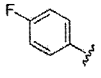
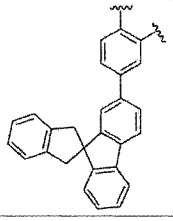
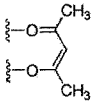
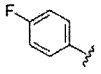
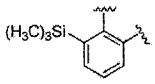
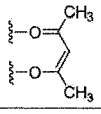
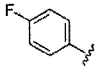
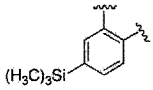
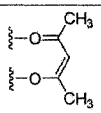
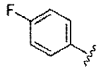
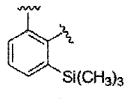
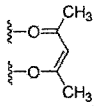
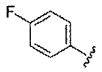
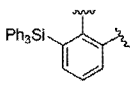
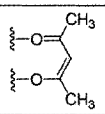
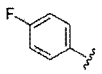
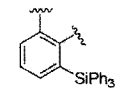
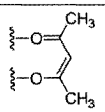
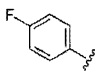
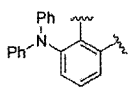
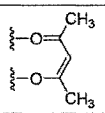
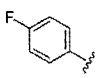
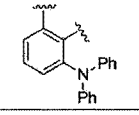
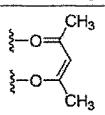
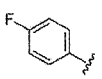
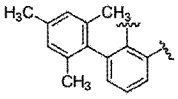
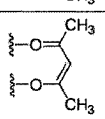
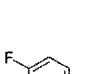
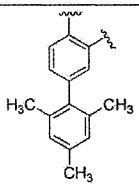
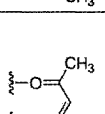
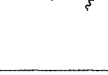
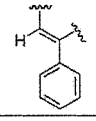
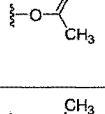
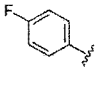
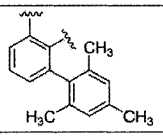
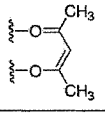
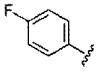
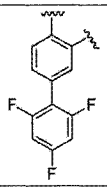
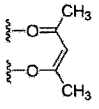
310	H	H	H	H					2
311	H	H	H	H					2
312	H	H	H	H					2
313	H	H	H	H					2
314	H	H	H	H					2
315	H	H	H	H					2
316	H	H	H	H					2
317	H	H	H	H					2
318	H	H	H	H					2

319	H	H	H	H					2
320	H	H	H	H					2
321	H	H	H	H					2
322	H	H	H	H					2
323	H	H	H	H					2
324	H	H	H	H					2
325	H	H	H	H					2
326	H	H	H	H					2
327	H	H	H	H					2

328	H	H	H	H					2
329	H	H	H	H					2
330	H	H	H	H					2
331	H	H	H	H					2
332	H	H	H	H					2
333	H	H	H	H					2
334	H	H	H	H					2
335	H	H	H	H					2
336	H	H	H	H					2

337	H	H	H	H					2
338	H	H	H	H					2
339	H	H	H	H					2
340	H	H	H	H					2
341	H	H	H	H					2
342	H	H	H	H					2
343	H	H	H	H					2
344	H	H	H	H					2

345	H	H	H	H					2
346	H	H	H	H					2
347	H	H	H	H					2
348	H	H	H	H					2
349	H	H	H	H					2
350	H	H	H	H					2
351	H	H	H	H					2
352	H	H	H	H					2
353	H	H	H	H					2
354	H	H	H	H					2
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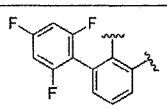
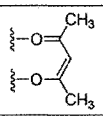
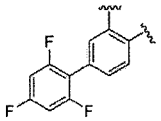
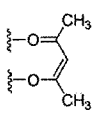
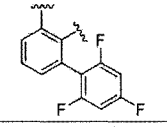
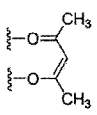
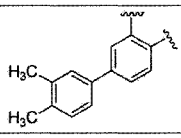
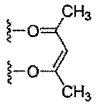
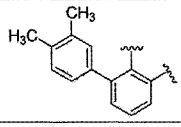
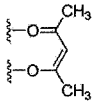
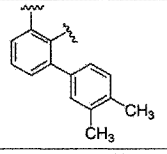
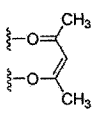
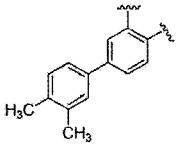
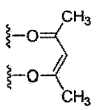
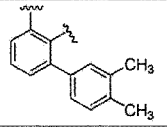
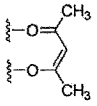
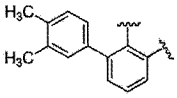
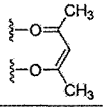
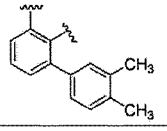
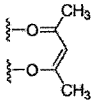
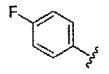
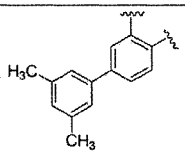
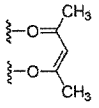
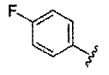
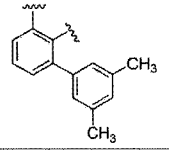
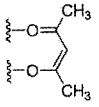
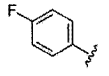
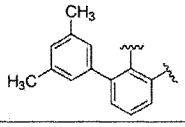
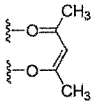
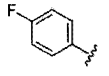
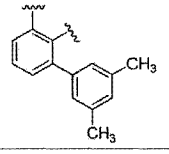
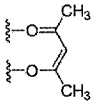
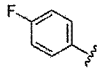
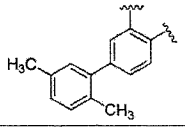
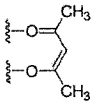
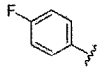
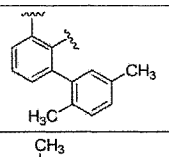
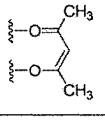
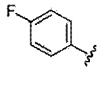
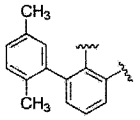
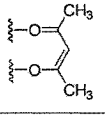
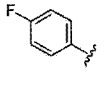
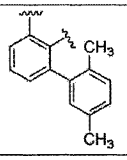
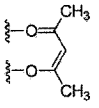
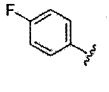
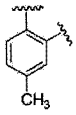
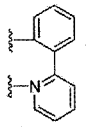
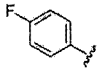
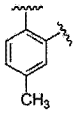
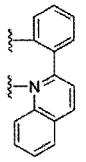
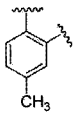
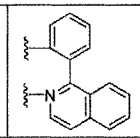
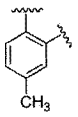
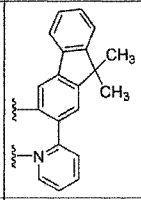
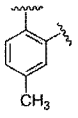
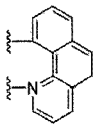
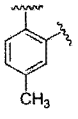
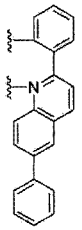
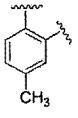
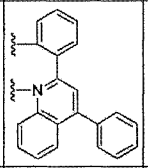
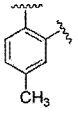
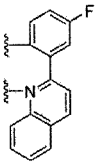
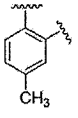
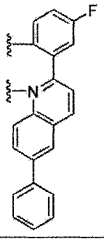
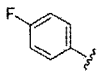
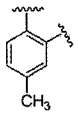
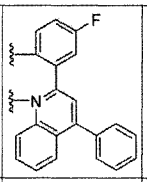
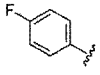
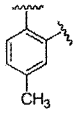
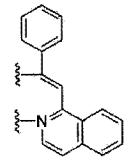
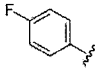
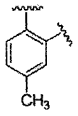
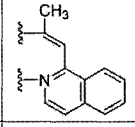
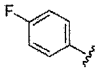
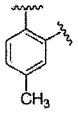
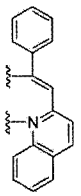
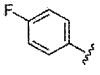
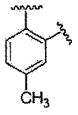
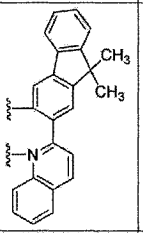
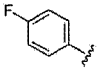
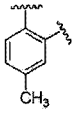
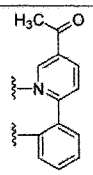
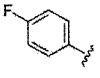
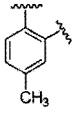
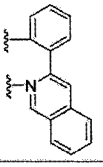
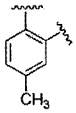
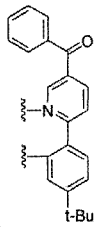
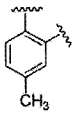
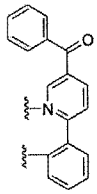
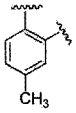
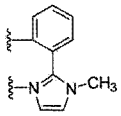
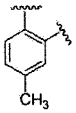
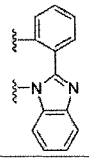
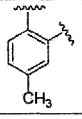
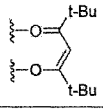
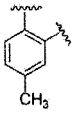
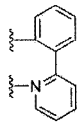
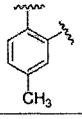
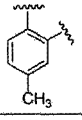
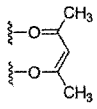
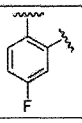
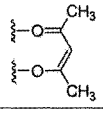
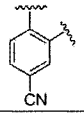
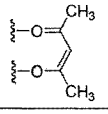
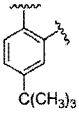
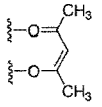
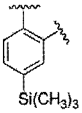
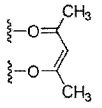
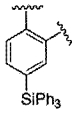
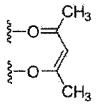
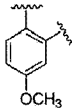
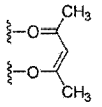
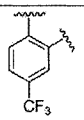
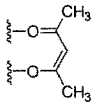
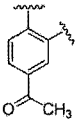
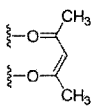
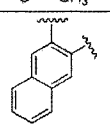
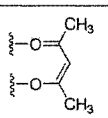
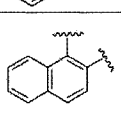
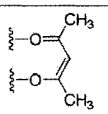
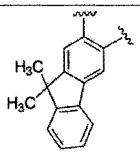
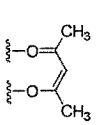
356	H	H	H	H					2
357	H	H	H	H					2
358	H	H	H	H					2
359	H	H	H	H					2
360	H	H	H	H					2
361	H	H	H	H					2
362	H	H	H	H					2
363	H	H	H	H					2
364	H	H	H	H					2
365	H	H	H	H					2

366	H	H	H	H					2
367	H	H	H	H					2
368	H	H	H	H					2
369	H	H	H	H					2
370	H	H	H	H					2
371	H	H	H	H					2
372	H	H	H	H					2
373	H	H	H	H					2
374	H	H	H	H					2
375	H	H	H	H					2

376	H	H	H	H					2
377	H	H	H	H					2
378	H	H	H	H					2
379	H	H	H	H					2
380	H	H	H	H					2
381	H	H	H	H					2
382	H	H	H	H					2

383	H	H	H	H					2
384	H	H	H	H					2
385	H	H	H	H					2
386	H	H	H	H					2
387	H	H	H	H					2
388	H	H	H	H					2
389	H	H	H	H					2

390	H	H	H	H					2
391	H	H	H	H					2
392	H	H	H	H					2
393	H	H	H	H					2
394	H	H	H	H					2
395	H	H	H	H					1
396	H	H	H	H				–	3
397	H	H	H	H					2
398	H	H	H	H					2

399	H	H	H	H					2
400	H	H	H	H					2
401	H	H	H	H					2
402	H	H	H	H					2
403	H	H	H	H					2
404	H	H	H	H					2
405	H	H	H	H					2
406	H	H	H	H					2
407	H	H	H	H					2
408	H	H	H	H					2
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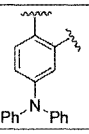
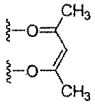
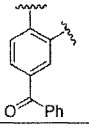
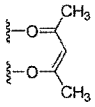
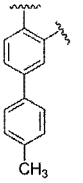
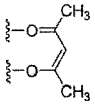
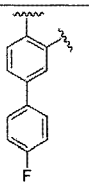
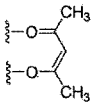
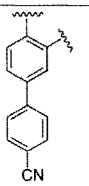
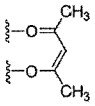
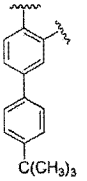
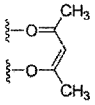
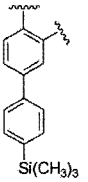
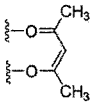
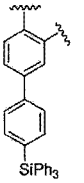
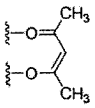
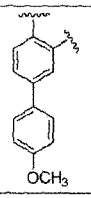
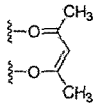
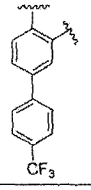
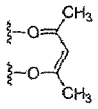
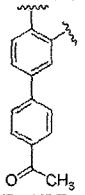
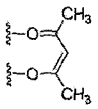
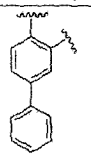
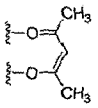
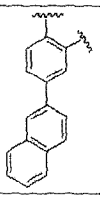
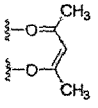
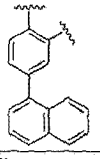
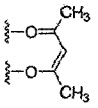
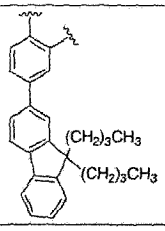
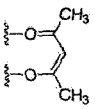
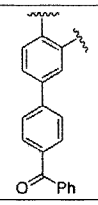
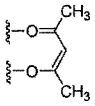
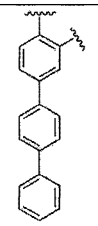
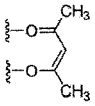
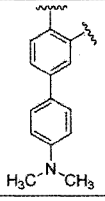
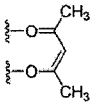
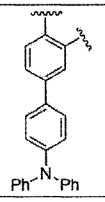
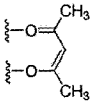
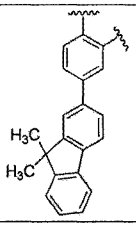
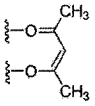
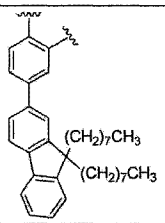
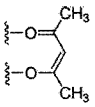
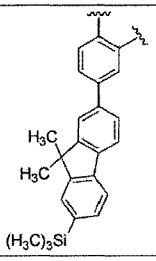
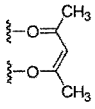
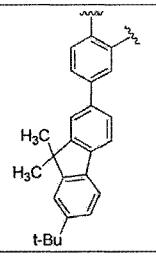
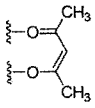
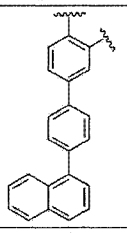
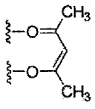
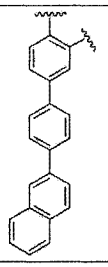
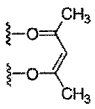
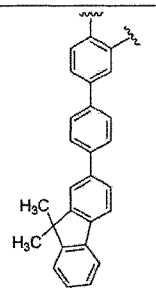
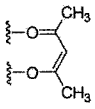
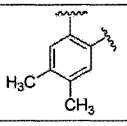
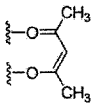
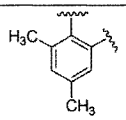
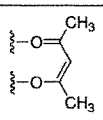
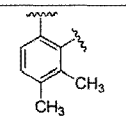
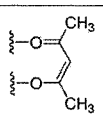
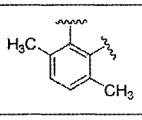
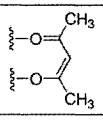
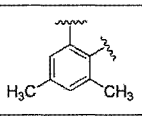
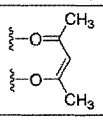
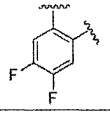
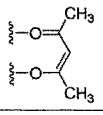
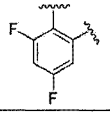
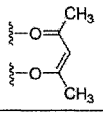
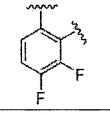
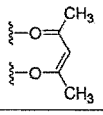
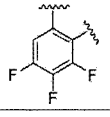
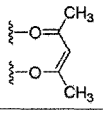
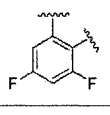
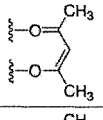
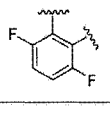
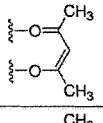
410	H	H	H	H					2
411	H	H	H	H					2
412	H	H	H	H					2
413	H	H	H	H					2
414	H	H	H	H					2
415	H	H	H	H					2
416	H	H	H	H					2
417	H	H	H	H					2

418	H	H	H	H					2
419	H	H	H	H					2
420	H	H	H	H					2
421	H	H	H	H					2
422	H	H	H	H					2
423	H	H	H	H					2
424	H	H	H	H					2

425	H	H	H	H					2
426	H	H	H	H					2
427	H	H	H	H					2
428	H	H	H	H					2
429	H	H	H	H					2
430	H	H	H	H					2

431	H	H	H	H					2
432	H	H	H	H					2
433	H	H	H	H					2
434	H	H	H	H					2
435	H	H	H	H					2
436	H	H	H	H					2

437	H	H	H	H					2
438	H	H	H	H					2
439	H	H	H	H					2
440	H	H	H	H					2
441	H	H	H	H					2
442	H	H	H	H					2
443	H	H	H	H					2
444	H	H	H	H					2
445	H	H	H	H					2
446	H	H	H	H					2
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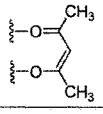
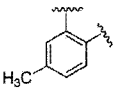
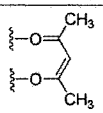
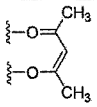
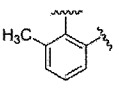
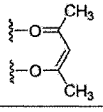
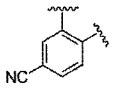
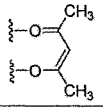
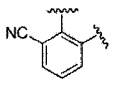
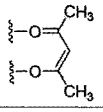
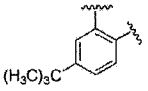
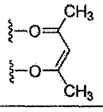
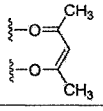
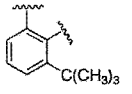
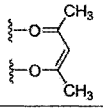
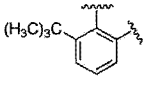
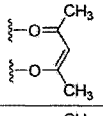
449	H	H	H	H					2
450	H	H	H	H					2
451	H	H	H	H					2
452	H	H	H	H					2
453	H	H	H	H					2
454	H	H	H	H					2
455	H	H	H	H					2
456	H	H	H	H					2
457	H	H	H	H					2
458	H	H	H	H					2
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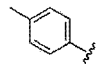
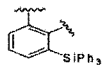
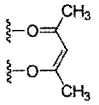
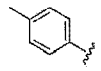
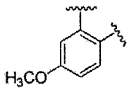
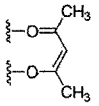
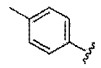
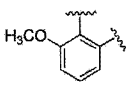
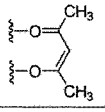
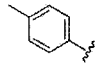
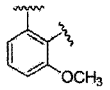
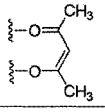
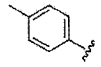
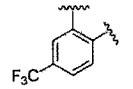
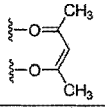
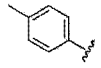
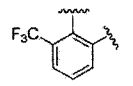
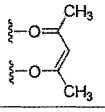
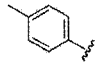
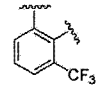
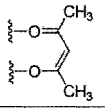
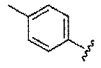
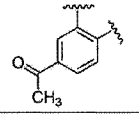
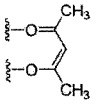
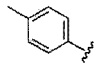
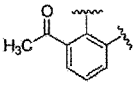
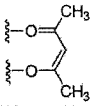
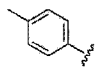
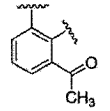
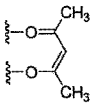
461	H	H	H	H					2
462	H	H	H	H					2
463	H	H	H	H					2
464	H	H	H	H					2
465	H	H	H	H					2
466	H	H	H	H					2
467	H	H	H	H					2
468	H	H	H	H					2
469	H	H	H	H					2
470	H	H	H	H					2
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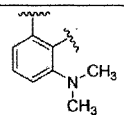
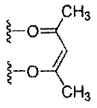
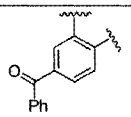
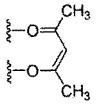
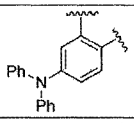
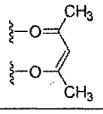
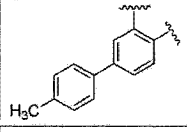
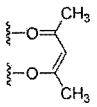
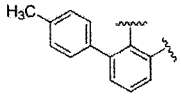
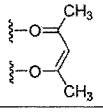
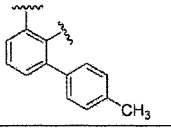
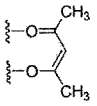
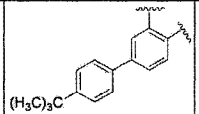
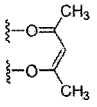
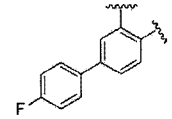
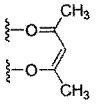
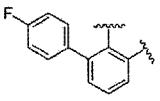
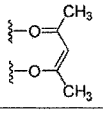
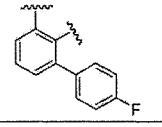
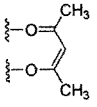
473	H	H	H	H					2
474	H	H	H	H					2
475	H	H	H	H					2
476	H	H	H	H					2
477	H	H	H	H					2
478	H	H	H	H					2
479	H	H	H	H					2
480	H	H	H	H					2
481	H	H	H	H					2
482	H	H	H	H					2
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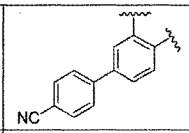
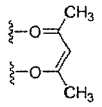
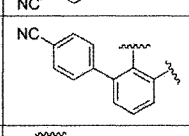
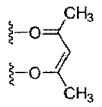
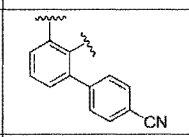
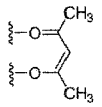
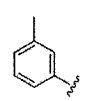
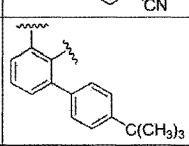
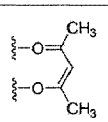
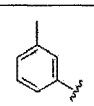
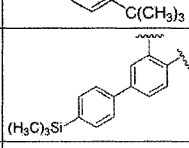
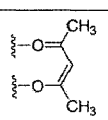
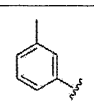
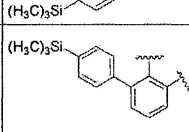
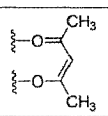
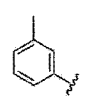
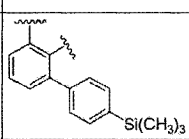
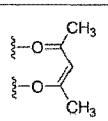
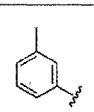
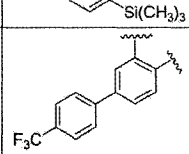
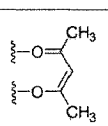
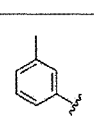
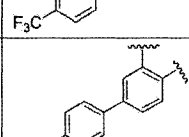
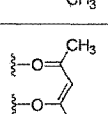
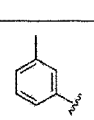
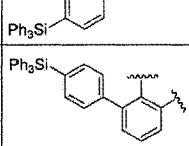
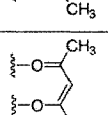
484	H	H	H	H					2
485	H	H	H	H					2
486	H	H	H	H					2
487	H	H	H	H					2
488	H	H	H	H					2
489	H	H	H	H					2
490	H	H	H	H					2
491	H	H	H	H					2
492	H	H	H	H					2
493	H	H	H	H					2
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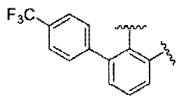
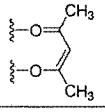
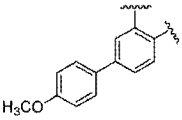
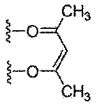
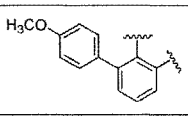
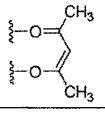
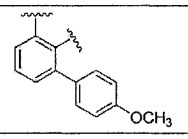
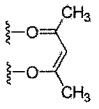
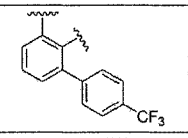
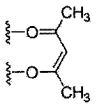
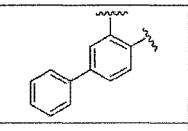
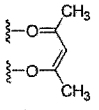
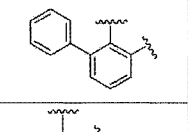
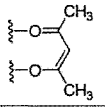
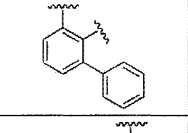
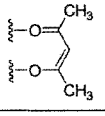
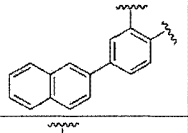
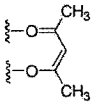
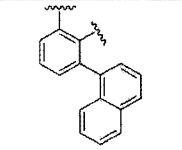
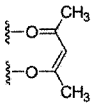
495	H	H	H	H					2
496	H	H	H	H					2
497	H	H	H	H					2
498	H	H	H	H					2
499	H	H	H	H					2
500	H	H	H	H					2
501	H	H	H	H					2
502	H	H	H	H					2
503	H	H	H	H					2
504	H	H	H	H					2
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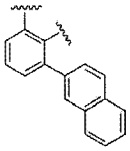
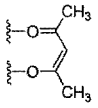
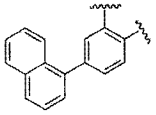
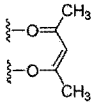
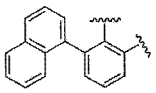
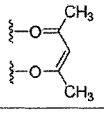
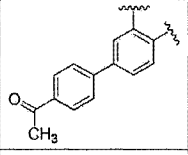
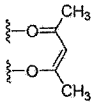
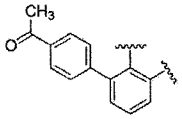
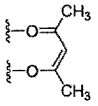
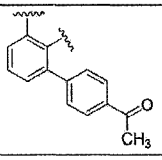
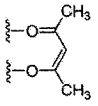
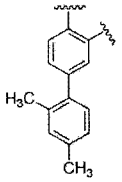
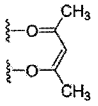
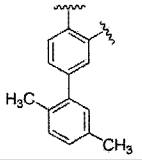
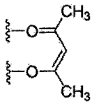
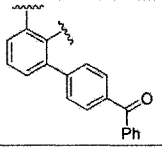
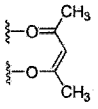
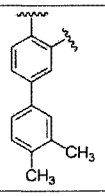
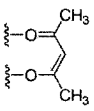
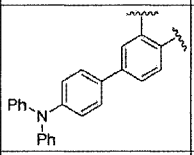
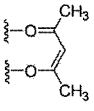
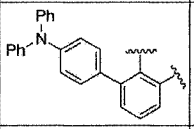
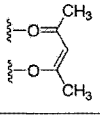
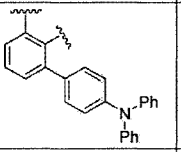
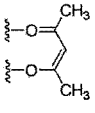
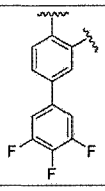
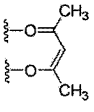
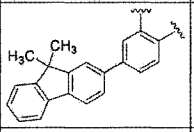
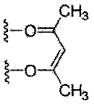
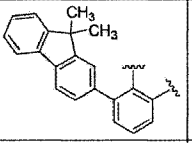
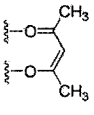
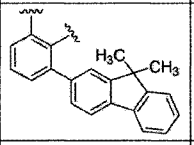
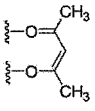
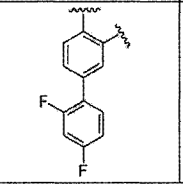
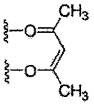
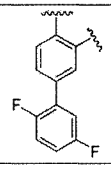
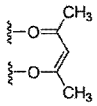
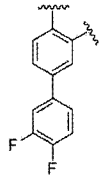
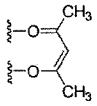
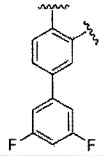
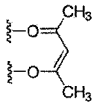
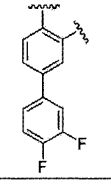
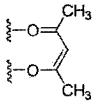
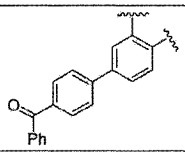
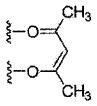
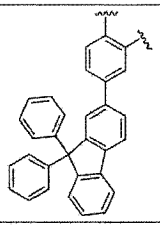
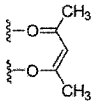
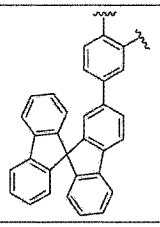
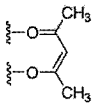
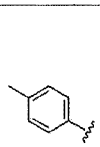
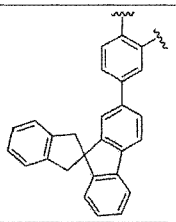
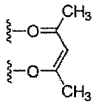
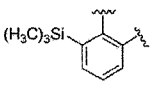
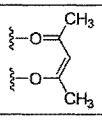
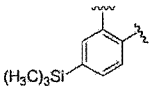
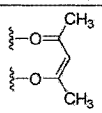
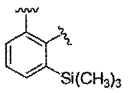
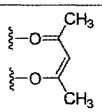
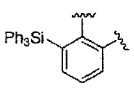
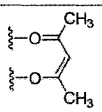
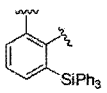
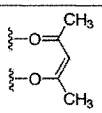
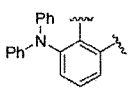
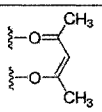
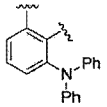
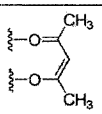
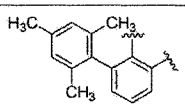
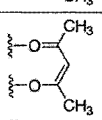
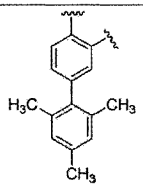
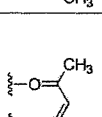
506	H	H	H	H					2
507	H	H	H	H					2
508	H	H	H	H					2
509	H	H	H	H					2
510	H	H	H	H					2
511	H	H	H	H					2
512	H	H	H	H					2
513	H	H	H	H					2
514	H	H	H	H					2

524	H	H	H	H					2
525	H	H	H	H					2
526	H	H	H	H					2
527	H	H	H	H					2
528	H	H	H	H					2
529	H	H	H	H					2
530	H	H	H	H					2
531	H	H	H	H					2
532	H	H	H	H					2

533	H	H	H	H					2
534	H	H	H	H					2
535	H	H	H	H					2
536	H	H	H	H					2
537	H	H	H	H					2
538	H	H	H	H					2
539	H	H	H	H					2

540	H	H	H	H					2
541	H	H	H	H					2
542	H	H	H	H					2
543	H	H	H	H					2
544	H	H	H	H					2
545	H	H	H	H					2
546	H	H	H	H					2
547	H	H	H	H					2
548	H	H	H	H					2
549	H	H	H	H					2
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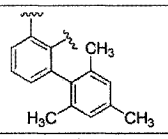
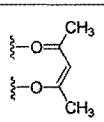
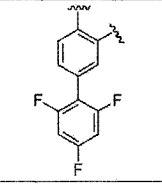
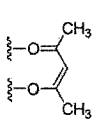
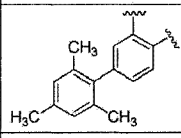
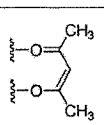
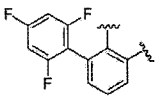
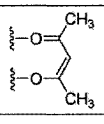
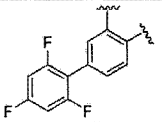
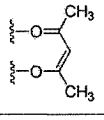
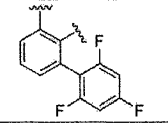
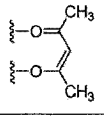
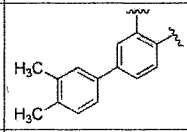
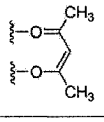
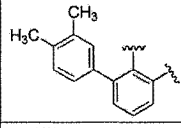
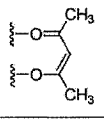
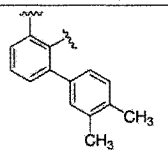
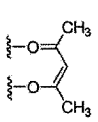
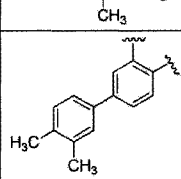
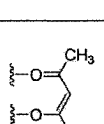
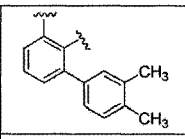
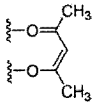
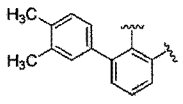
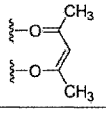
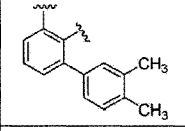
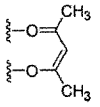
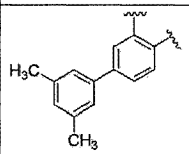
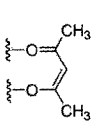
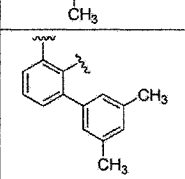
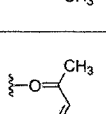
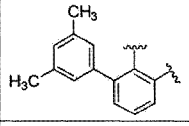
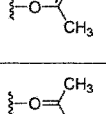
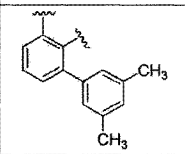
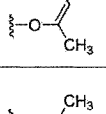
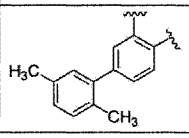
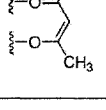
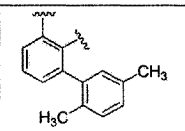
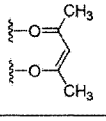
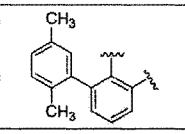
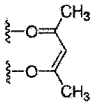
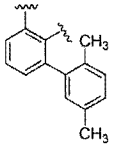
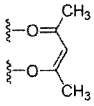
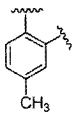
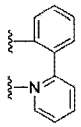
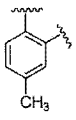
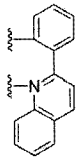
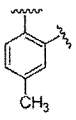
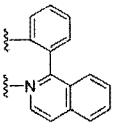
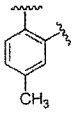
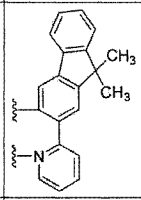
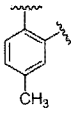
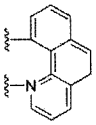
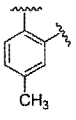
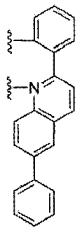
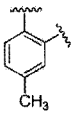
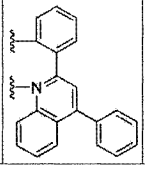
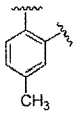
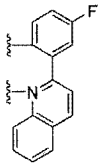
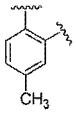
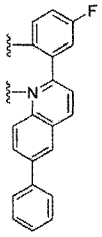
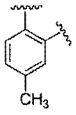
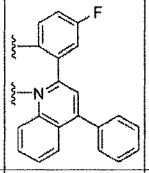
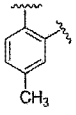
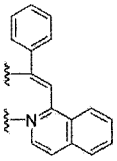
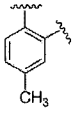
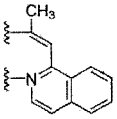
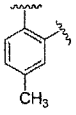
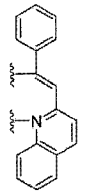
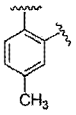
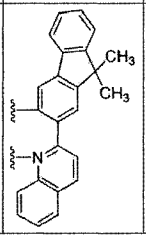
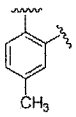
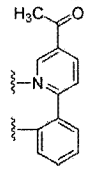
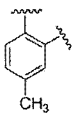
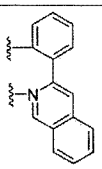
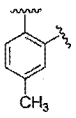
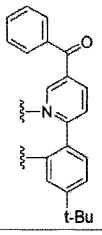
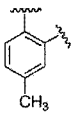
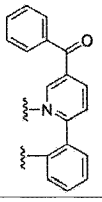
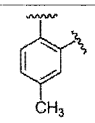
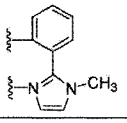
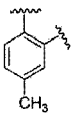
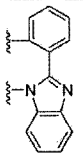
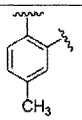
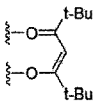
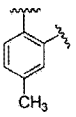
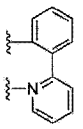
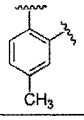
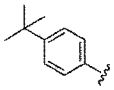
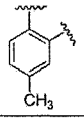
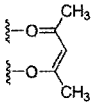
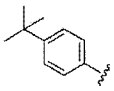
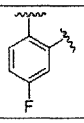
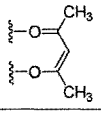
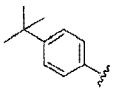
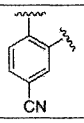
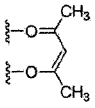
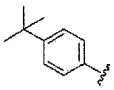
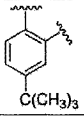
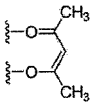
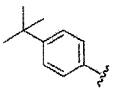
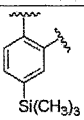
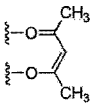
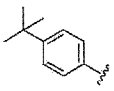
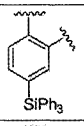
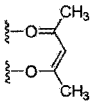
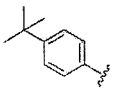
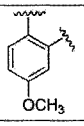
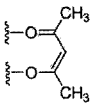
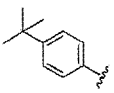
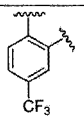
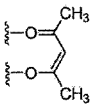
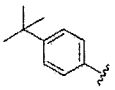
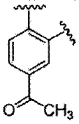
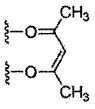
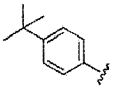
551	H	H	H	H					2
552	H	H	H	H					2
553	H	H	H	H					2
554	H	H	H	H					2
555	H	H	H	H					2
556	H	H	H	H					2
557	H	H	H	H					2
558	H	H	H	H					2
559	H	H	H	H					2
560	H	H	H	H					2

561	H	H	H	H					2
562	H	H	H	H					2
563	H	H	H	H					2
564	H	H	H	H					2
565	H	H	H	H					2
566	H	H	H	H					2
567	H	H	H	H					2
568	H	H	H	H					2
569	H	H	H	H					2
570	H	H	H	H					2

571	H	H	H	H					2
572	H	H	H	H					2
573	H	H	H	H					2
574	H	H	H	H					2
575	H	H	H	H					2
576	H	H	H	H					2
577	H	H	H	H					2
578	H	H	H	H					2

579	H	H	H	H					2
580	H	H	H	H					2
581	H	H	H	H					2
582	H	H	H	H					2
583	H	H	H	H					2
584	H	H	H	H					2
585	H	H	H	H					2

586	H	H	H	H					2
587	H	H	H	H					2
588	H	H	H	H					2
589	H	H	H	H					2
590	H	H	H	H					2
591	H	H	H	H					2
592	H	H	H	H					2
593	H	H	H	H					1

594	H	H	H	H				-	3
595	H	H	H	H					2
596	H	H	H	H					2
597	H	H	H	H					2
598	H	H	H	H					2
599	H	H	H	H					2
600	H	H	H	H					2
601	H	H	H	H					2
602	H	H	H	H					2
603	H	H	H	H					2
604	H	H	H	H					2
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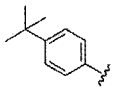
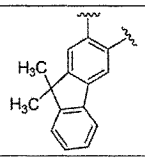
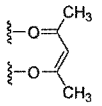
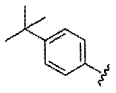
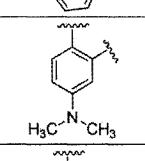
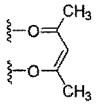
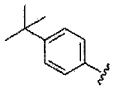
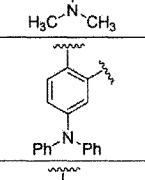
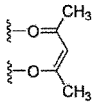
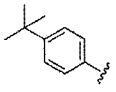
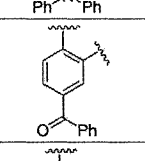
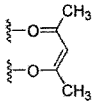
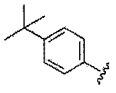
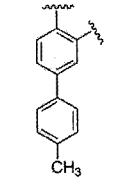
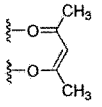
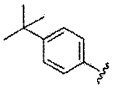
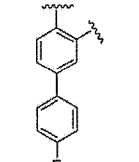
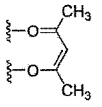
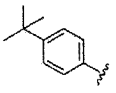
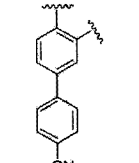
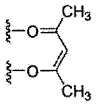
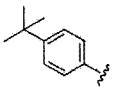
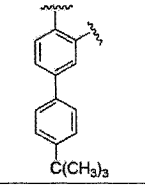
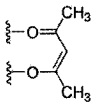
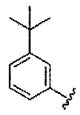
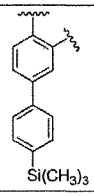
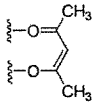
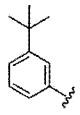
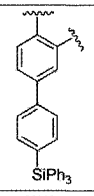
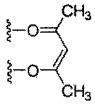
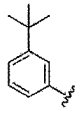
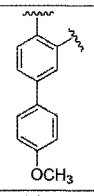
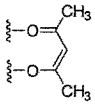
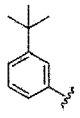
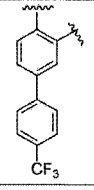
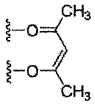
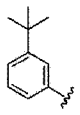
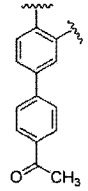
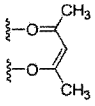
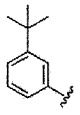
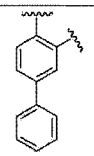
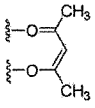
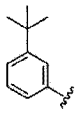
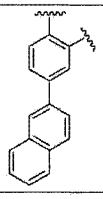
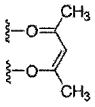
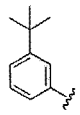
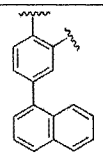
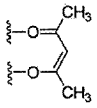
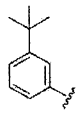
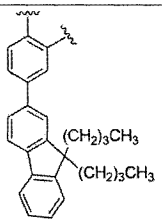
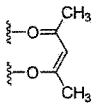
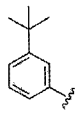
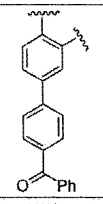
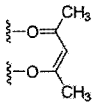
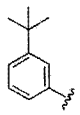
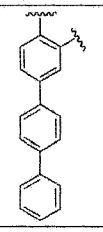
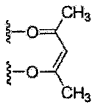
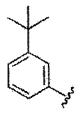
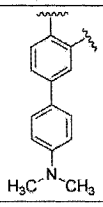
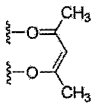
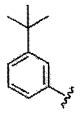
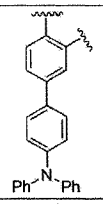
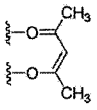
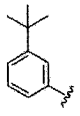
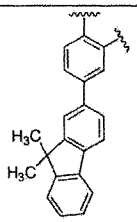
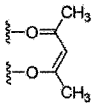
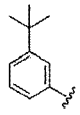
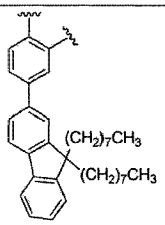
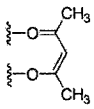
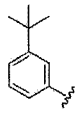
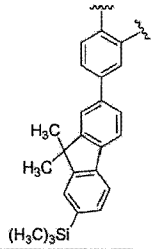
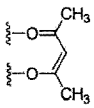
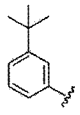
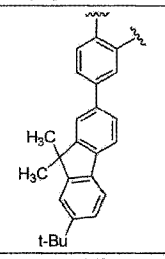
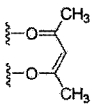
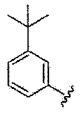
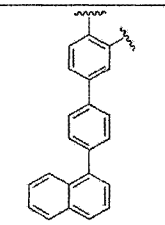
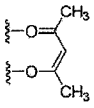
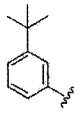
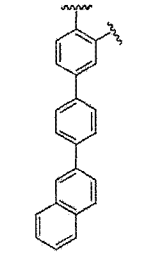
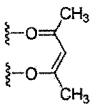
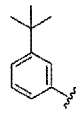
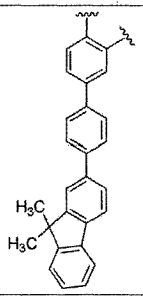
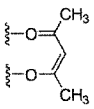
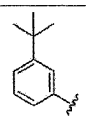
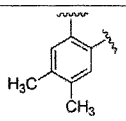
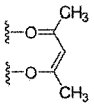
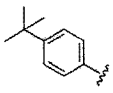
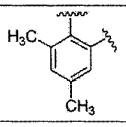
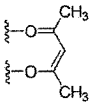
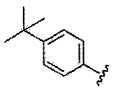
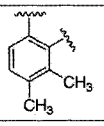
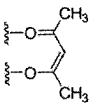
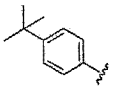
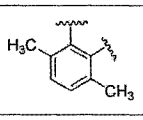
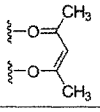
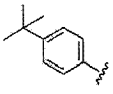
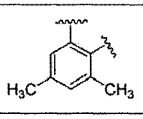
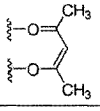
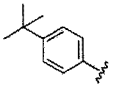
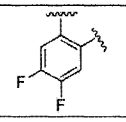
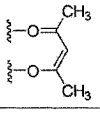
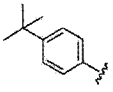
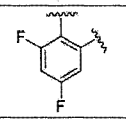
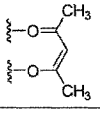
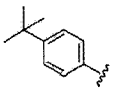
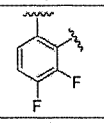
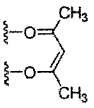
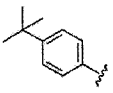
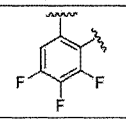
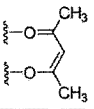
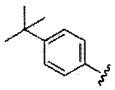
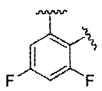
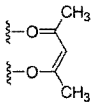
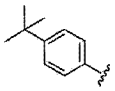
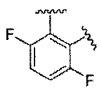
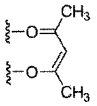
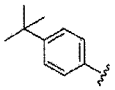
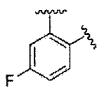
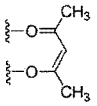
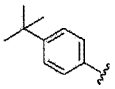
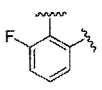
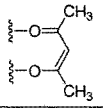
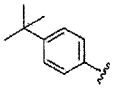
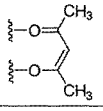
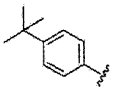
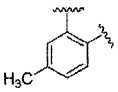
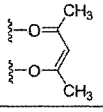
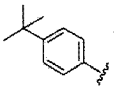
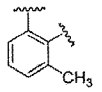
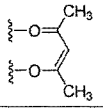
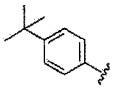
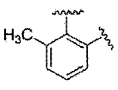
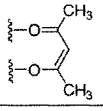
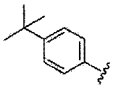
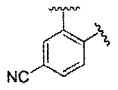
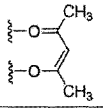
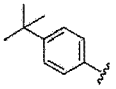
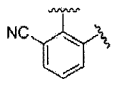
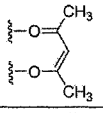
606	H	H	H	H					2
607	H	H	H	H					2
608	H	H	H	H					2
609	H	H	H	H					2
610	H	H	H	H					2
611	H	H	H	H					2
612	H	H	H	H					2
613	H	H	H	H					2

614	H	H	H	H					2
615	H	H	H	H					2
616	H	H	H	H					2
617	H	H	H	H					2
618	H	H	H	H					2
619	H	H	H	H					2
620	H	H	H	H					2

621	H	H	H	H					2
622	H	H	H	H					2
623	H	H	H	H					2
624	H	H	H	H					2
625	H	H	H	H					2
626	H	H	H	H					2
627	H	H	H	H					2

628	H	H	H	H					2
629	H	H	H	H					2
630	H	H	H	H					2
631	H	H	H	H					2
632	H	H	H	H					2

633	H	H	H	H					2
634	H	H	H	H					2
635	H	H	H	H					2
636	H	H	H	H					2
637	H	H	H	H					2
638	H	H	H	H					2
639	H	H	H	H					2
640	H	H	H	H					2
641	H	H	H	H					2
642	H	H	H	H					2

643	H	H	H	H					2
644	H	H	H	H					2
645	H	H	H	H					2
646	H	H	H	H					2
647	H	H	H	H					2
648	H	H	H	H					2
649	H	H	H	H					2
650	H	H	H	H					2
651	H	H	H	H					2
652	H	H	H	H					2
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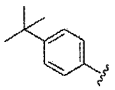
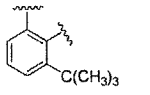
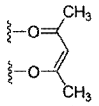
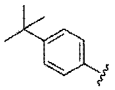
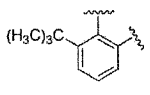
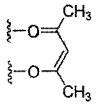
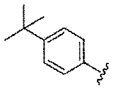
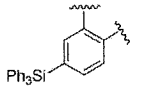
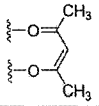
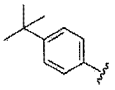
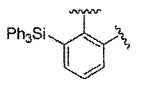
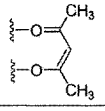
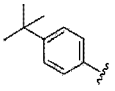
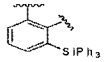
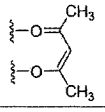
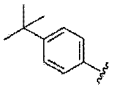
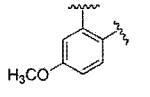
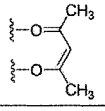
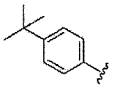
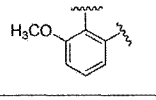
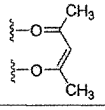
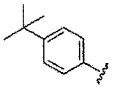
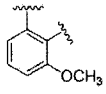
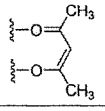
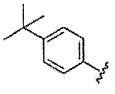
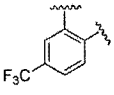
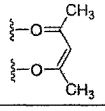
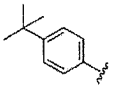
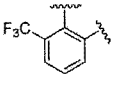
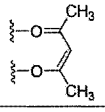
655	H	H	H	H					2
656	H	H	H	H					2
657	H	H	H	H					2
658	H	H	H	H					2
659	H	H	H	H					2
660	H	H	H	H					2
661	H	H	H	H					2
662	H	H	H	H					2
663	H	H	H	H					2
664	H	H	H	H					2
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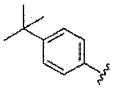
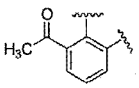
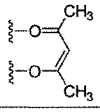
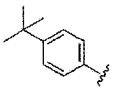
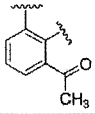
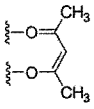
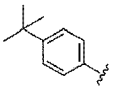
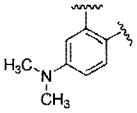
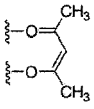
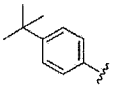
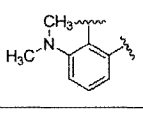
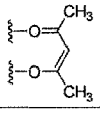
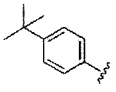
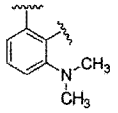
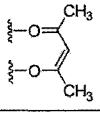
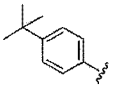
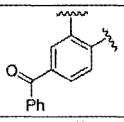
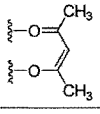
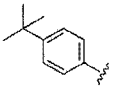
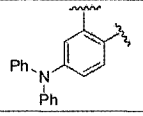
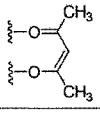
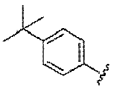
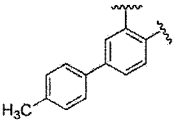
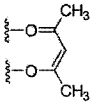
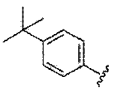
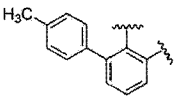
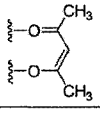
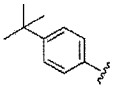
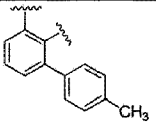
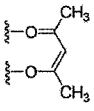
667	H	H	H	H					2
668	H	H	H	H					2
669	H	H	H	H					2
670	H	H	H	H					2
671	H	H	H	H					2
672	H	H	H	H					2
673	H	H	H	H					2
674	H	H	H	H					2
675	H	H	H	H					2
676	H	H	H	H					2
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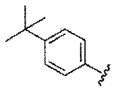
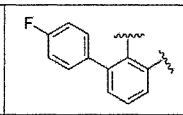
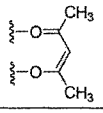
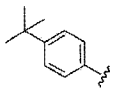
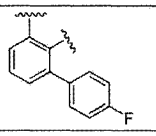
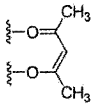
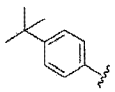
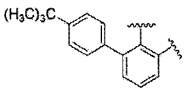
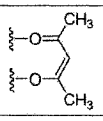
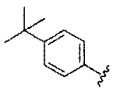
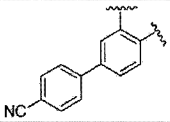
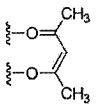
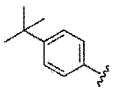
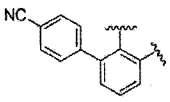
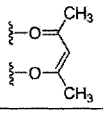
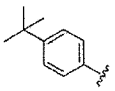
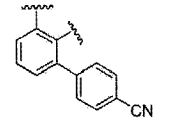
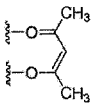
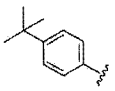
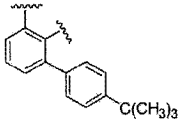
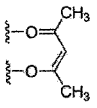
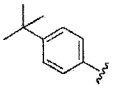
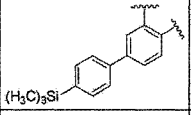
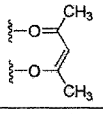
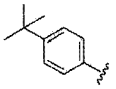
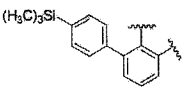
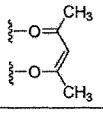
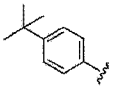
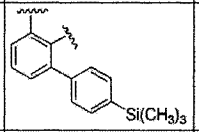
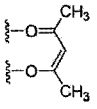
679	H	H	H	H					2
680	H	H	H	H					2
681	H	H	H	H					2
682	H	H	H	H					2
683	H	H	H	H					2
684	H	H	H	H					2
685	H	H	H	H					2
686	H	H	H	H					2
687	H	H	H	H					2
688	H	H	H	H					2
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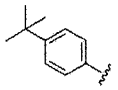
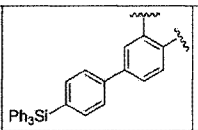
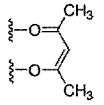
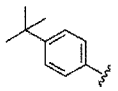
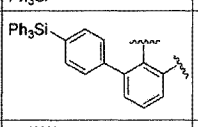
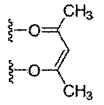
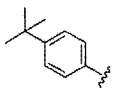
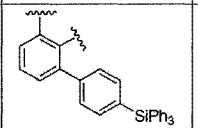
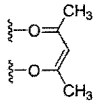
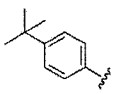
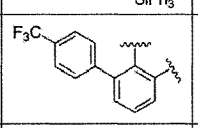
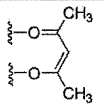
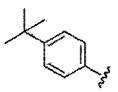
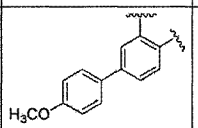
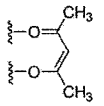
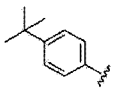
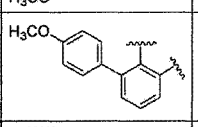
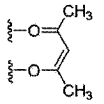
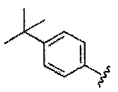
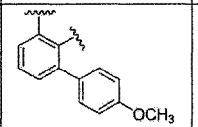
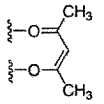
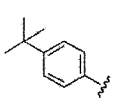
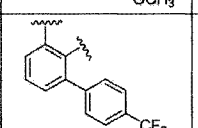
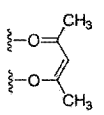
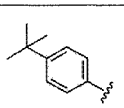
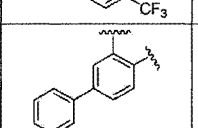
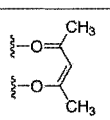
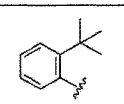
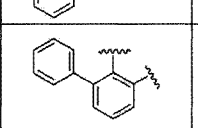
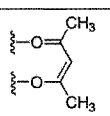
690	H	H	H	H					2
691	H	H	H	H					2
692	H	H	H	H					2
693	H	H	H	H					2
694	H	H	H	H					2
695	H	H	H	H					2
696	H	H	H	H					2
697	H	H	H	H					2
698	H	H	H	H					2
699	H	H	H	H					2
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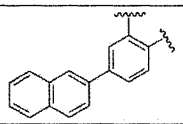
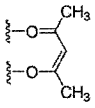
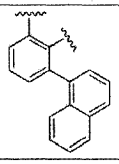
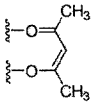
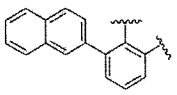
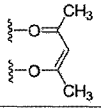
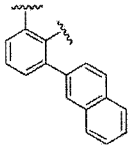
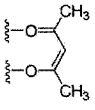
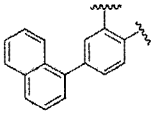
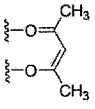
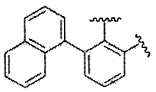
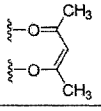
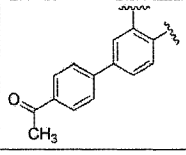
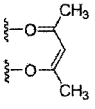
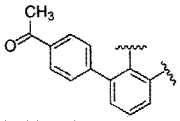
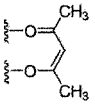
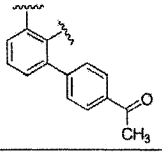
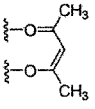
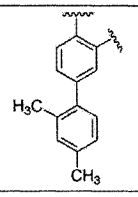
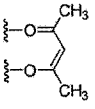
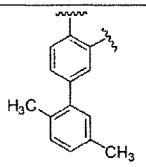
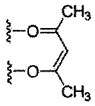
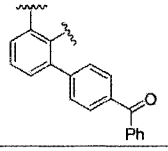
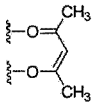
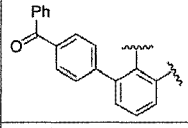
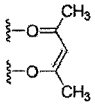
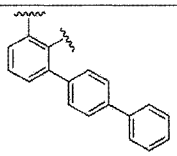
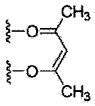
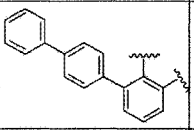
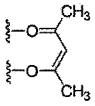
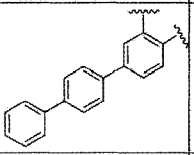
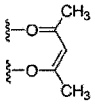
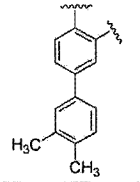
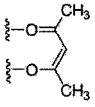
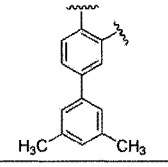
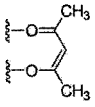
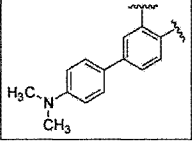
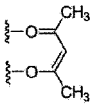
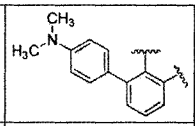
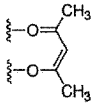
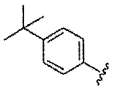
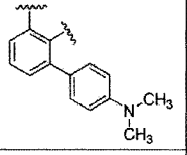
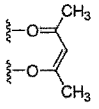
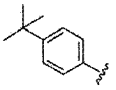
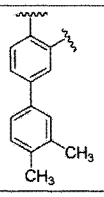
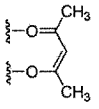
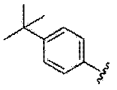
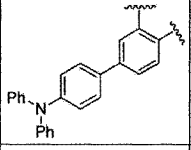
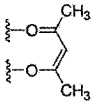
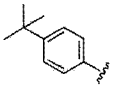
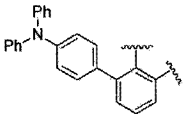
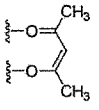
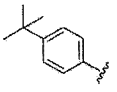
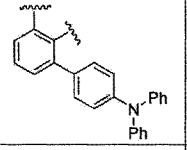
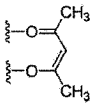
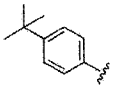
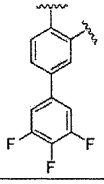
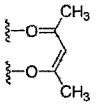
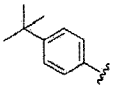
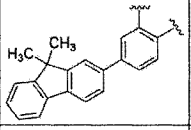
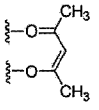
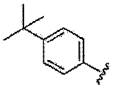
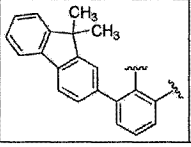
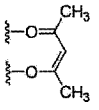
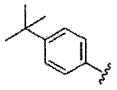
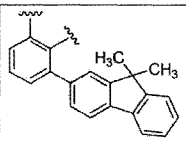
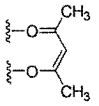
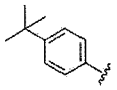
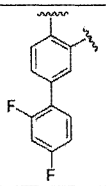
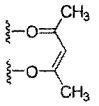
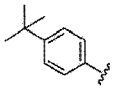
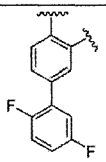
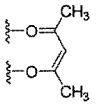
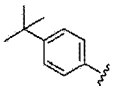
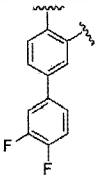
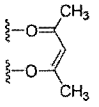
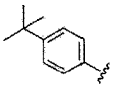
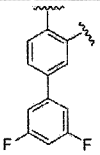
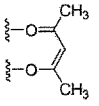
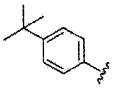
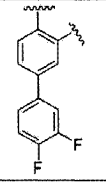
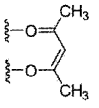
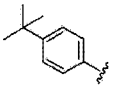
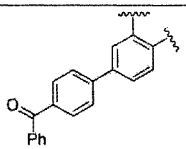
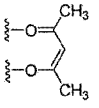
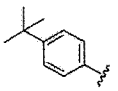
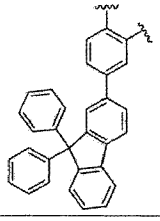
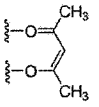
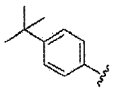
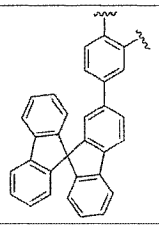
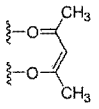
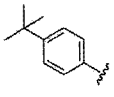
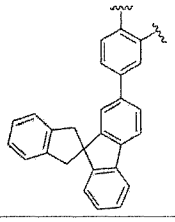
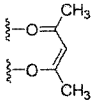
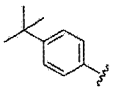
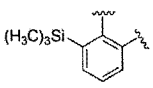
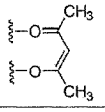
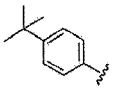
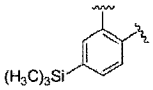
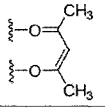
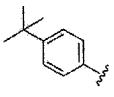
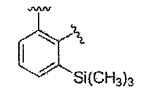
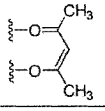
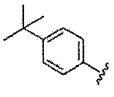
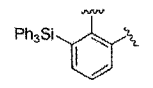
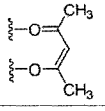
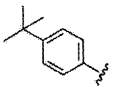
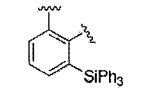
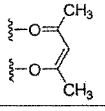
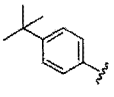
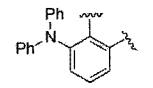
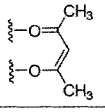
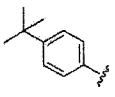
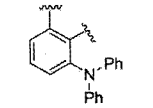
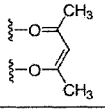
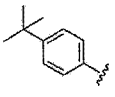
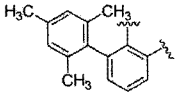
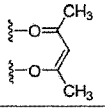
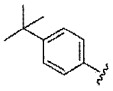
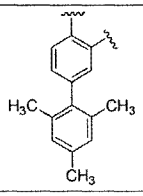
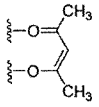
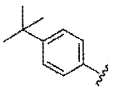
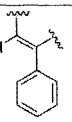
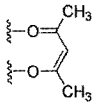
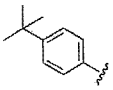
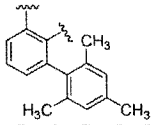
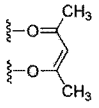
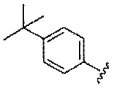
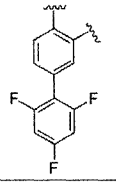
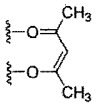
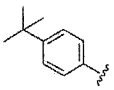
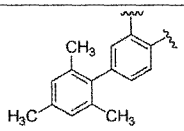
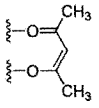
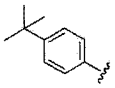
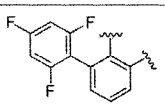
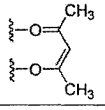
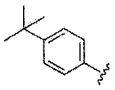
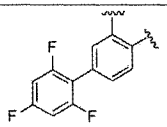
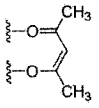
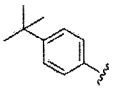
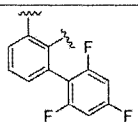
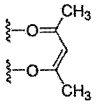
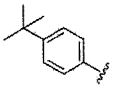
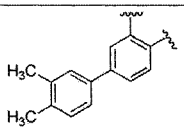
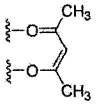
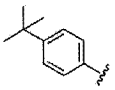
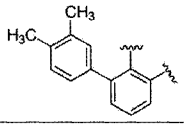
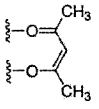
701	H	H	H	H					2
702	H	H	H	H					2
703	H	H	H	H					2
704	H	H	H	H					2
705	H	H	H	H					2
706	H	H	H	H					2
707	H	H	H	H					2
708	H	H	H	H					2
709	H	H	H	H					2
710	H	H	H	H					2

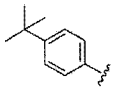
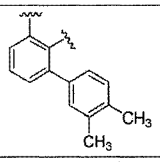
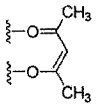
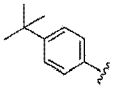
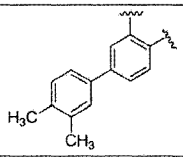
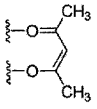
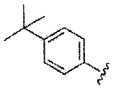
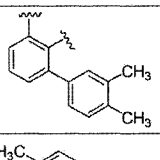
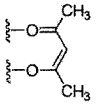
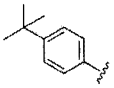
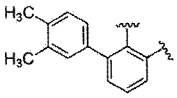
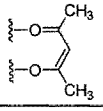
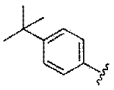
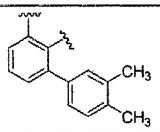
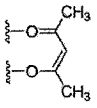
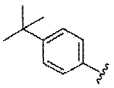
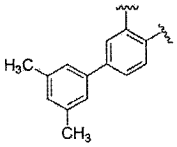
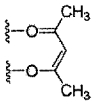
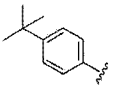
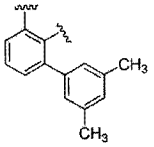
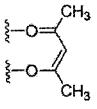
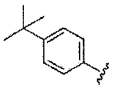
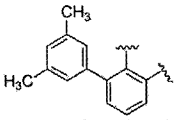
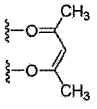
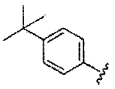
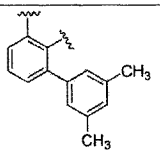
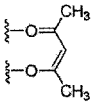
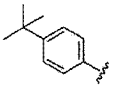
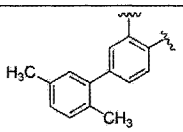
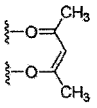
711	H	H	H	H					2
712	H	H	H	H					2
713	H	H	H	H					2
714	H	H	H	H					2
715	H	H	H	H					2
716	H	H	H	H					2
717	H	H	H	H					2
718	H	H	H	H					2
719	H	H	H	H					2

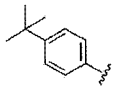
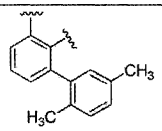
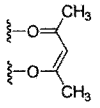
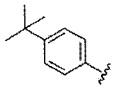
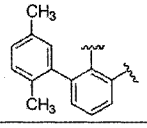
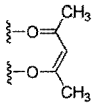
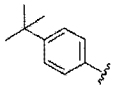
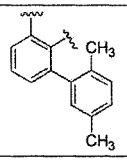
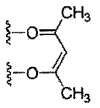
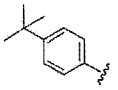
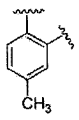
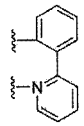
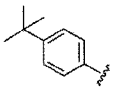
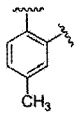
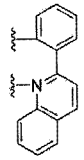
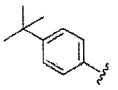
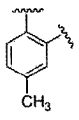
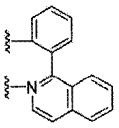
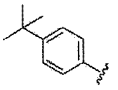
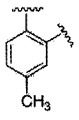
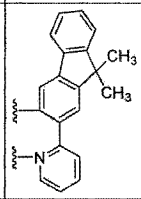
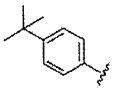
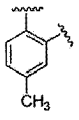
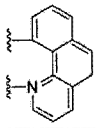
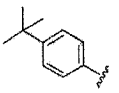
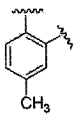
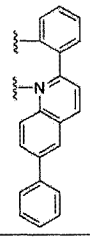
720	H	H	H	H					2
721	H	H	H	H					2
722	H	H	H	H					2
723	H	H	H	H					2
724	H	H	H	H					2
725	H	H	H	H					2
726	H	H	H	H					2
727	H	H	H	H					2
728	H	H	H	H					2

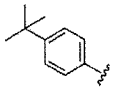
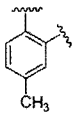
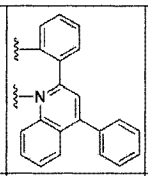
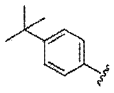
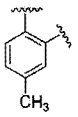
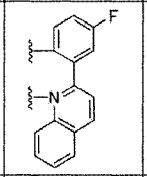
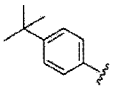
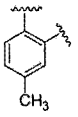
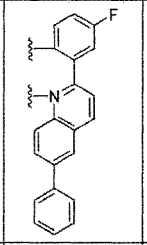
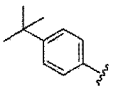
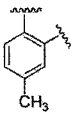
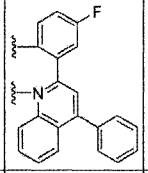
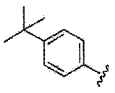
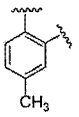
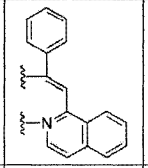
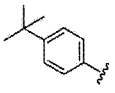
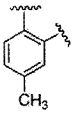
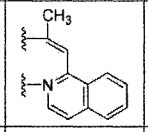
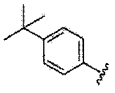
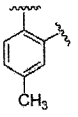
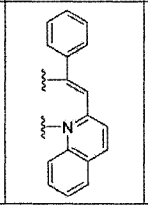
729	H	H	H	H					2
730	H	H	H	H					2
731	H	H	H	H					2
732	H	H	H	H					2
733	H	H	H	H					2
734	H	H	H	H					2
735	H	H	H	H					2
736	H	H	H	H					2

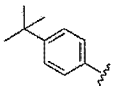
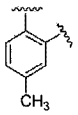
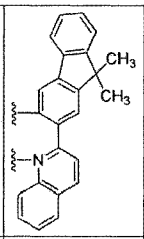
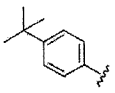
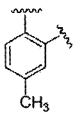
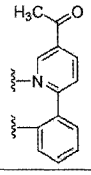
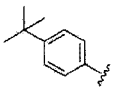
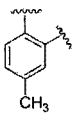
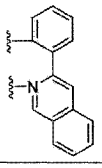
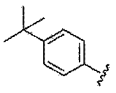
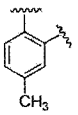
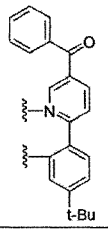
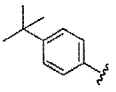
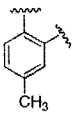
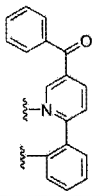
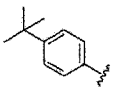
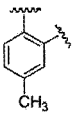
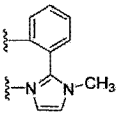
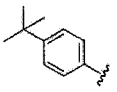
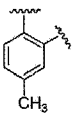
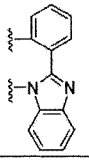
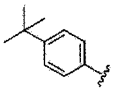
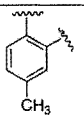
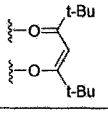
737	H	H	H	H					2
738	H	H	H	H					2
739	H	H	H	H					2
740	H	H	H	H					2
741	H	H	H	H					2
742	H	H	H	H					2
743	H	H	H	H					2
744	H	H	H	H					2
745	H	H	H	H					2
746	H	H	H	H					2

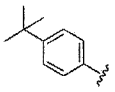
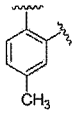
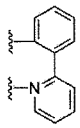
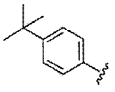
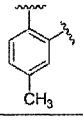
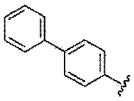
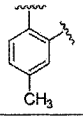
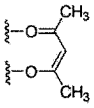
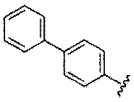
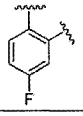
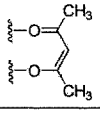
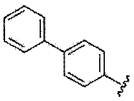
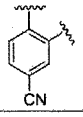
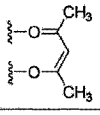
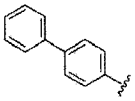
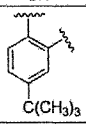
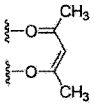
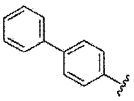
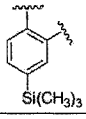
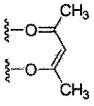
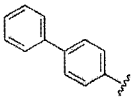
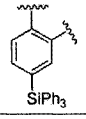
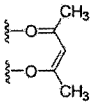
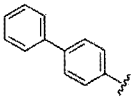
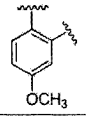
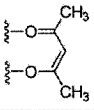
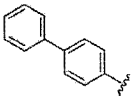
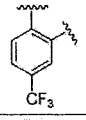
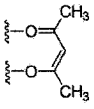
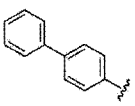
747	H	H	H	H					2
748	H	H	H	H					2
749	H	H	H	H					2
750	H	H	H	H					2
751	H	H	H	H					2
752	H	H	H	H					2
753	H	H	H	H					2
754	H	H	H	H					2
755	H	H	H	H					2
756	H	H	H	H					2

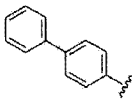
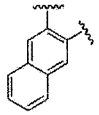
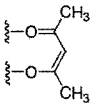
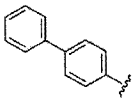
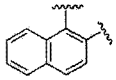
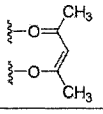
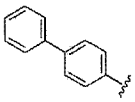
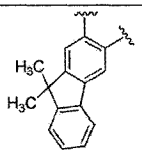
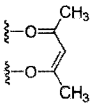
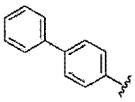
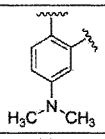
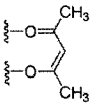
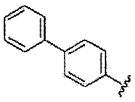
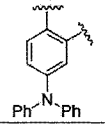
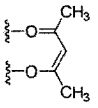
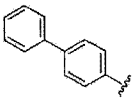
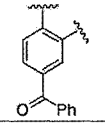
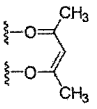
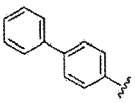
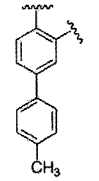
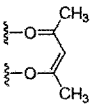
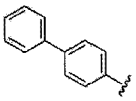
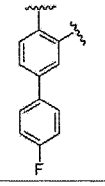
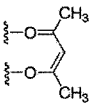
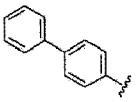
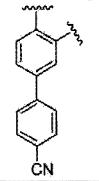
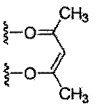
757	H	H	H	H					2
758	H	H	H	H					2
759	H	H	H	H					2
760	H	H	H	H					2
761	H	H	H	H					2
762	H	H	H	H					2
763	H	H	H	H					2
764	H	H	H	H					2
765	H	H	H	H					2
766	H	H	H	H					2

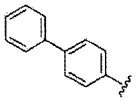
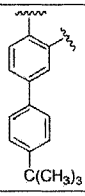
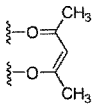
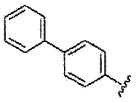
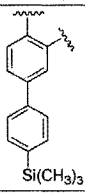
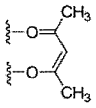
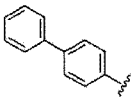
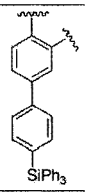
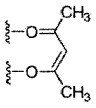
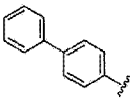
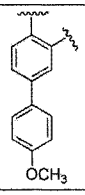
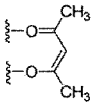
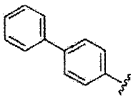
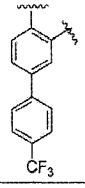
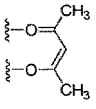
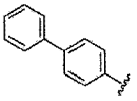
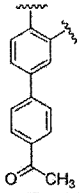
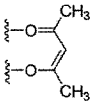
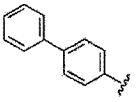
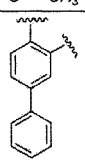
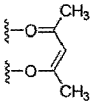
767	H	H	H	H					2
768	H	H	H	H					2
769	H	H	H	H					2
770	H	H	H	H					2
771	H	H	H	H					2
772	H	H	H	H					2
773	H	H	H	H					2
774	H	H	H	H					2
775	H	H	H	H					2

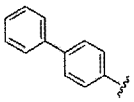
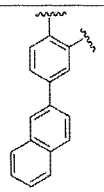
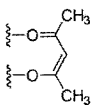
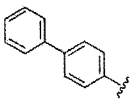
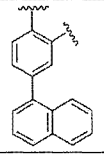
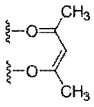
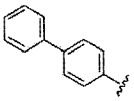
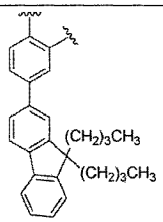
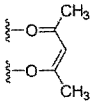
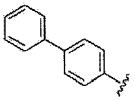
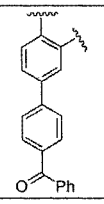
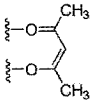
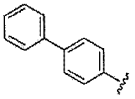
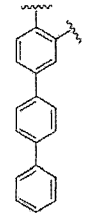
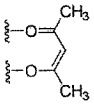
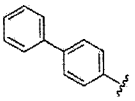
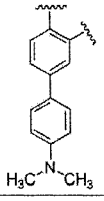
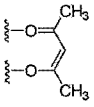
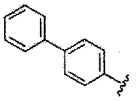
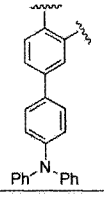
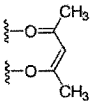
776	H	H	H	H					2
777	H	H	H	H					2
778	H	H	H	H					2
779	H	H	H	H					2
780	H	H	H	H					2
781	H	H	H	H					2
782	H	H	H	H					2

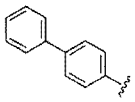
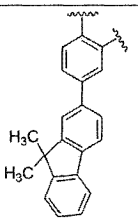
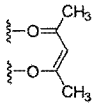
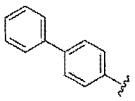
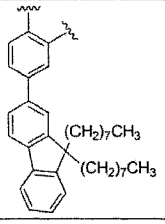
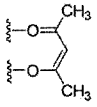
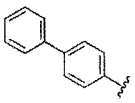
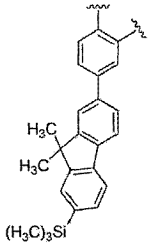
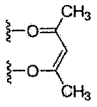
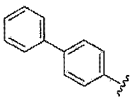
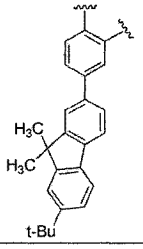
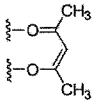
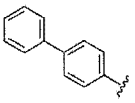
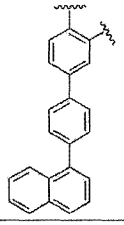
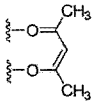
783	H	H	H	H					2
784	H	H	H	H					2
785	H	H	H	H					2
786	H	H	H	H					2
787	H	H	H	H					2
788	H	H	H	H					2
789	H	H	H	H					2
790	H	H	H	H					2

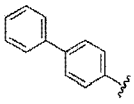
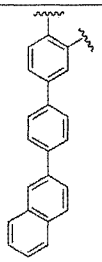
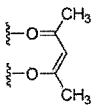
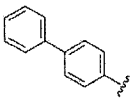
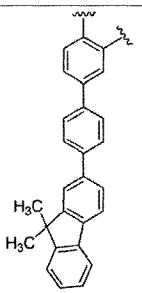
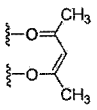
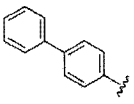
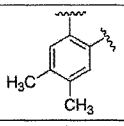
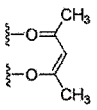
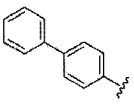
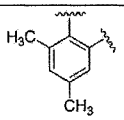
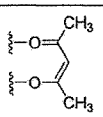
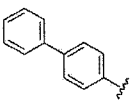
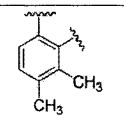
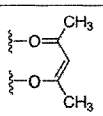
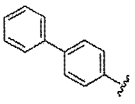
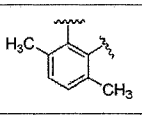
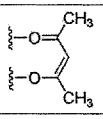
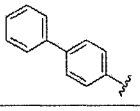
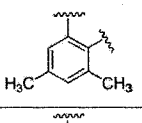
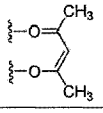
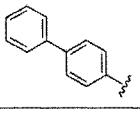
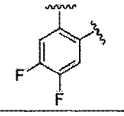
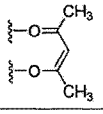
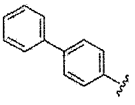
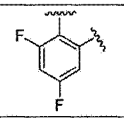
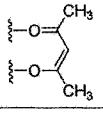
791	H	H	H	H					1
792	H	H	H	H				-	3
793	H	H	H	H					2
794	H	H	H	H					2
795	H	H	H	H					2
796	H	H	H	H					2
797	H	H	H	H					2
798	H	H	H	H					2
799	H	H	H	H					2
800	H	H	H	H					2
801	H	H	H	H					2

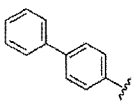
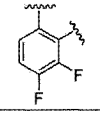
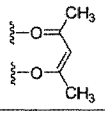
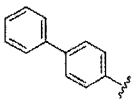
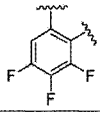
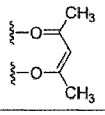
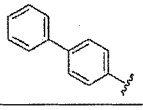
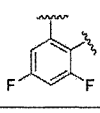
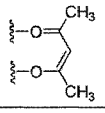
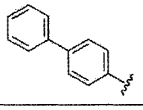
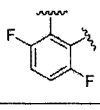
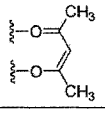
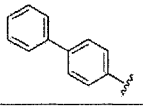
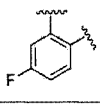
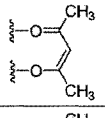
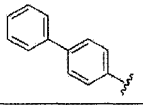
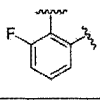
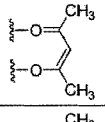
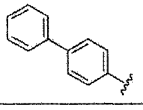
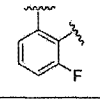
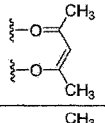
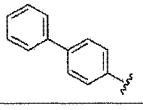
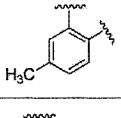
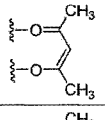
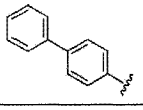
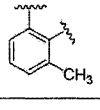
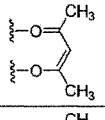
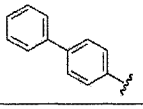
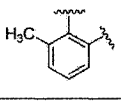
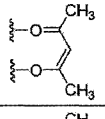
802	H	H	H	H					2
803	H	H	H	H					2
804	H	H	H	H					2
805	H	H	H	H					2
806	H	H	H	H					2
807	H	H	H	H					2
808	H	H	H	H					2
809	H	H	H	H					2
810	H	H	H	H					2

811	H	H	H	H					2
812	H	H	H	H					2
813	H	H	H	H					2
214	H	H	H	H					2
815	H	H	H	H					2
816	H	H	H	H					2
817	H	H	H	H					2

818	H	H	H	H					2
819	H	H	H	H					2
820	H	H	H	H					2
821	H	H	H	H					2
822	H	H	H	H					2
823	H	H	H	H					2
824	H	H	H	H					2

825	H	H	H	H					2
826	H	H	H	H					2
827	H	H	H	H					2
828	H	H	H	H					2
829	H	H	H	H					2

830	H	H	H	H					2
831	H	H	H	H					2
832	H	H	H	H					2
833	H	H	H	H					2
834	H	H	H	H					2
835	H	H	H	H					2
836	H	H	H	H					2
837	H	H	H	H					2
838	H	H	H	H					2

839	H	H	H	H					2
840	H	H	H	H					2
841	H	H	H	H					2
842	H	H	H	H					2
843	H	H	H	H					2
844	H	H	H	H					2
845	H	H	H	H					2
846	H	H	H	H					2
847	H	H	H	H					2
848	H	H	H	H					2
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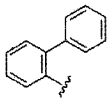
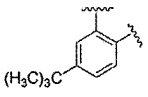
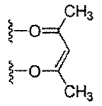
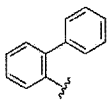
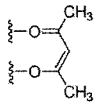
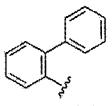
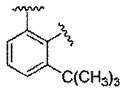
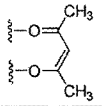
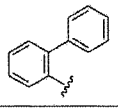
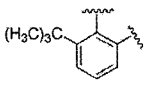
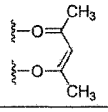
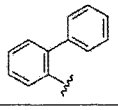
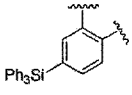
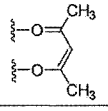
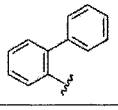
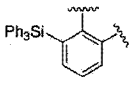
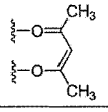
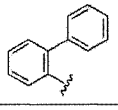
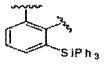
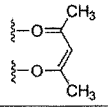
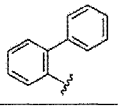
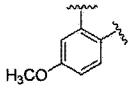
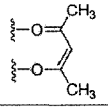
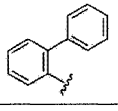
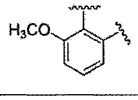
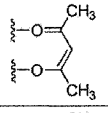
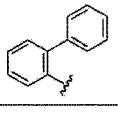
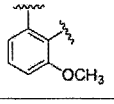
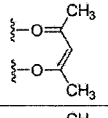
851	H	H	H	H					2
852	H	H	H	H					2
853	H	H	H	H					2
854	H	H	H	H					2
855	H	H	H	H					2
856	H	H	H	H					2
857	H	H	H	H					2
858	H	H	H	H					2
859	H	H	H	H					2
860	H	H	H	H					2
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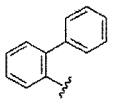
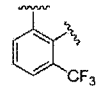
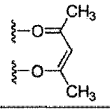
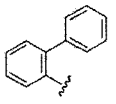
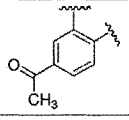
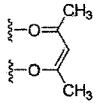
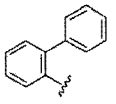
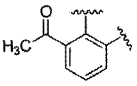
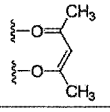
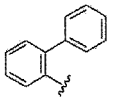
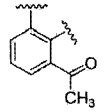
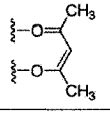
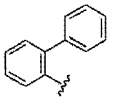
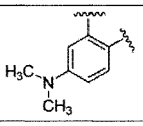
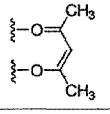
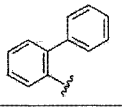
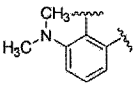
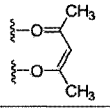
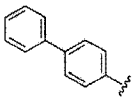
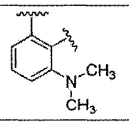
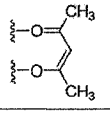
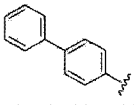
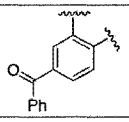
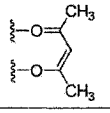
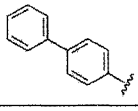
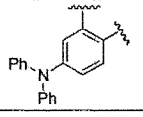
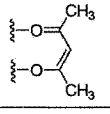
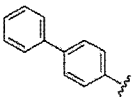
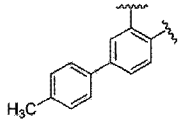
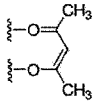
863	H	H	H	H					2
864	H	H	H	H					2
865	H	H	H	H					2
866	H	H	H	H					2
867	H	H	H	H					2
868	H	H	H	H					2
869	H	H	H	H					2
870	H	H	H	H					2
871	H	H	H	H					2
872	H	H	H	H					2
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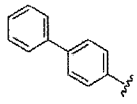
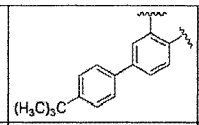
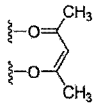
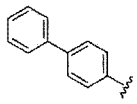
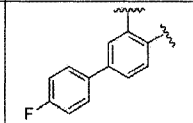
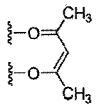
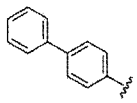
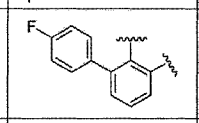
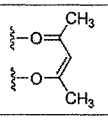
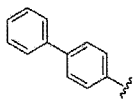
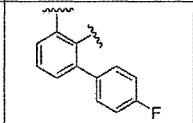
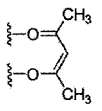
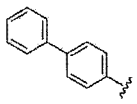
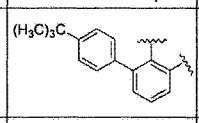
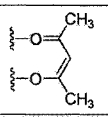
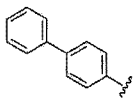
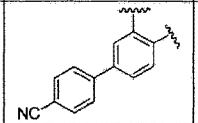
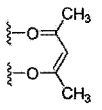
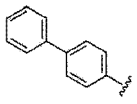
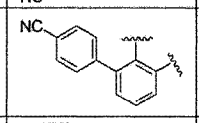
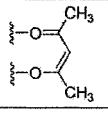
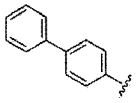
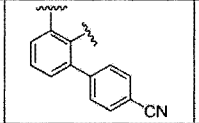
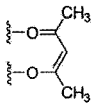
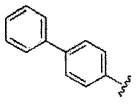
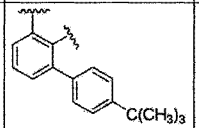
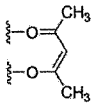
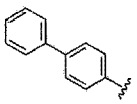
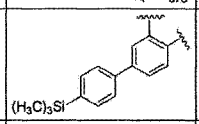
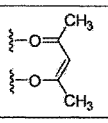
875	H	H	H	H					2
876	H	H	H	H					2
877	H	H	H	H					2
878	H	H	H	H					2
879	H	H	H	H					2
880	H	H	H	H					2
881	H	H	H	H					2
882	H	H	H	H					2
883	H	H	H	H					2
884	H	H	H	H					2
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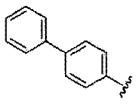
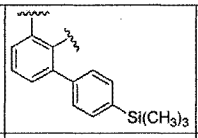
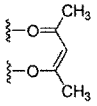
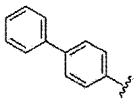
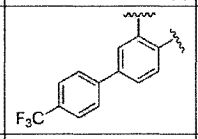
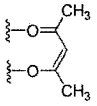
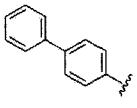
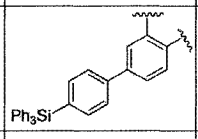
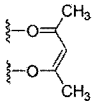
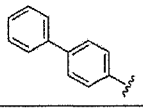
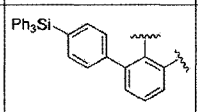
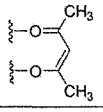
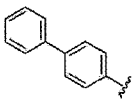
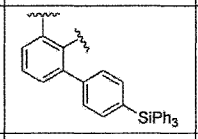
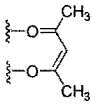
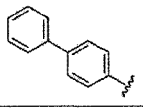
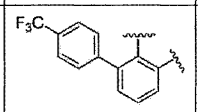
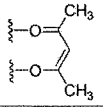
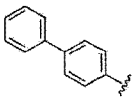
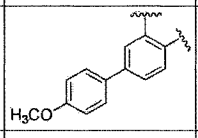
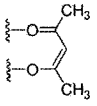
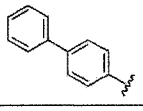
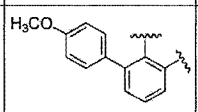
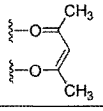
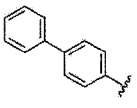
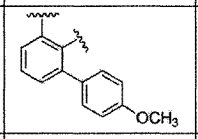
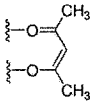
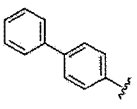
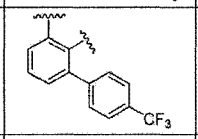
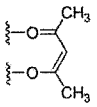
886	H	H	H	H					2
887	H	H	H	H					2
888	H	H	H	H					2
889	H	H	H	H					2
890	H	H	H	H					2
891	H	H	H	H					2
892	H	H	H	H					2
893	H	H	H	H					2
894	H	H	H	H					2
895	H	H	H	H					2
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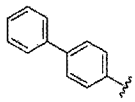
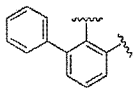
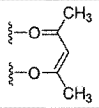
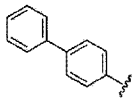
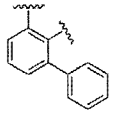
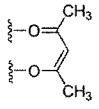
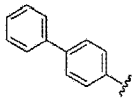
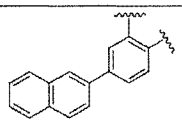
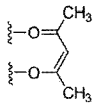
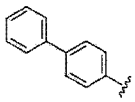
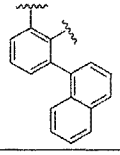
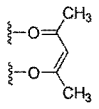
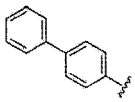
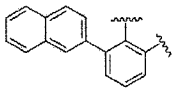
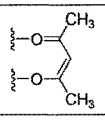
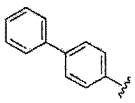
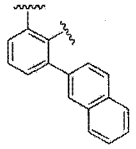
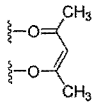
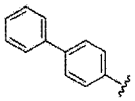
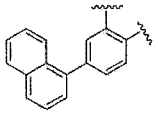
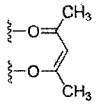
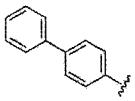
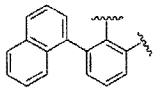
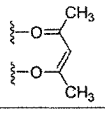
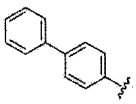
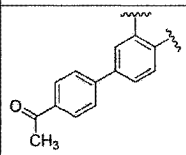
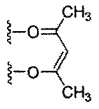
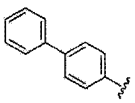
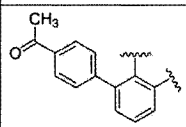
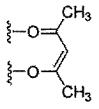
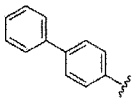
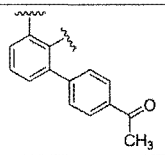
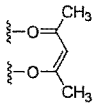
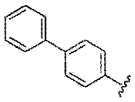
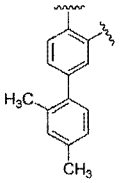
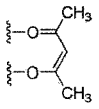
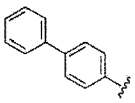
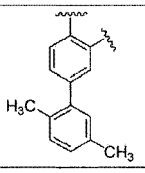
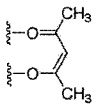
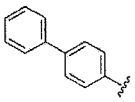
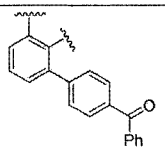
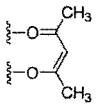
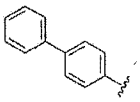
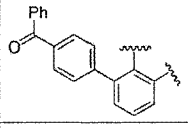
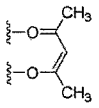
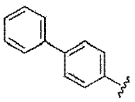
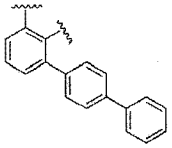
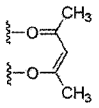
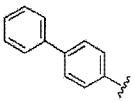
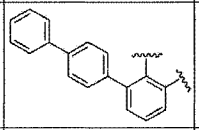
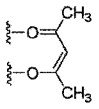
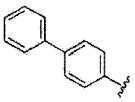
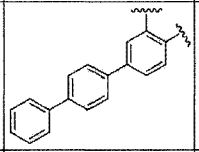
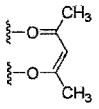
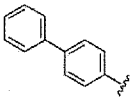
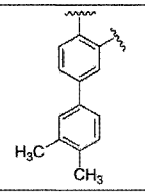
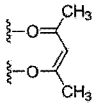
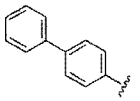
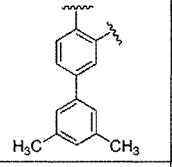
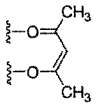
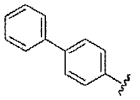
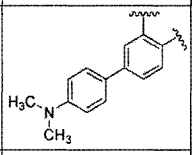
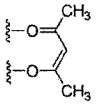
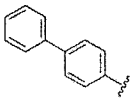
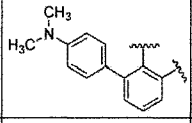
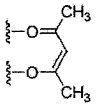
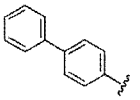
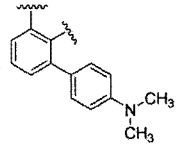
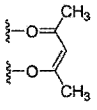
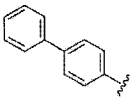
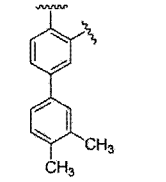
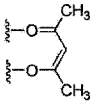
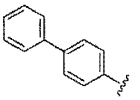
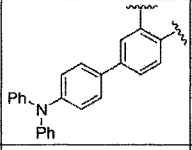
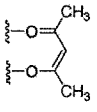
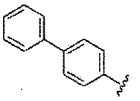
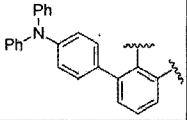
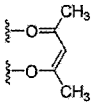
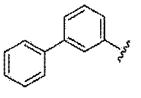
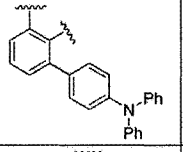
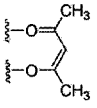
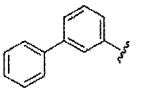
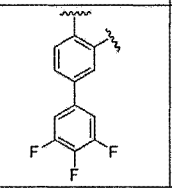
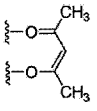
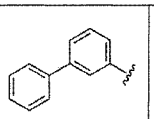
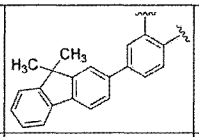
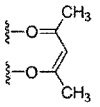
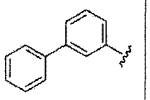
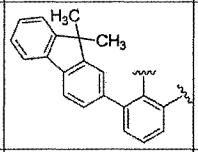
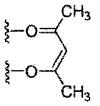
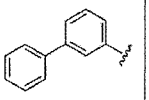
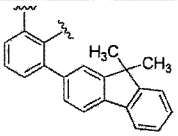
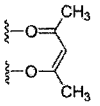
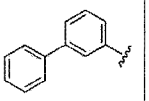
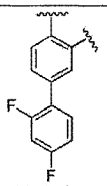
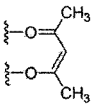
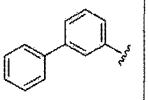
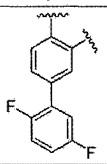
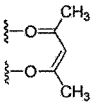
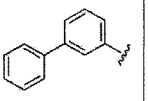
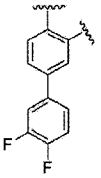
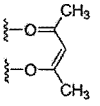
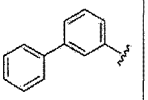
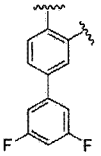
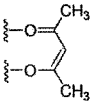
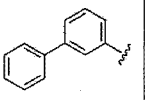
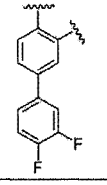
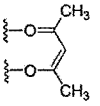
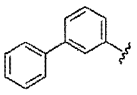
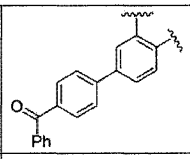
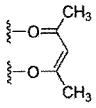
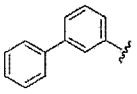
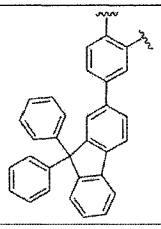
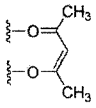
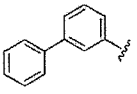
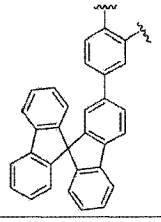
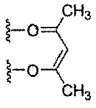
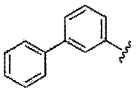
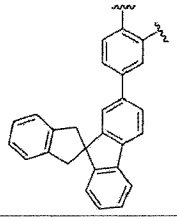
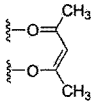
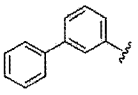
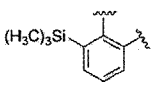
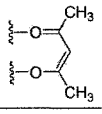
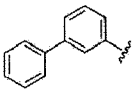
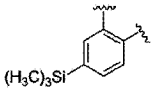
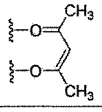
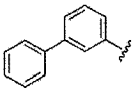
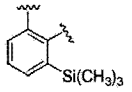
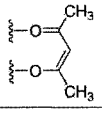
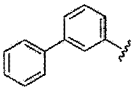
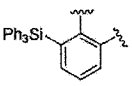
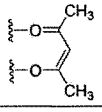
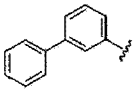
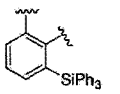
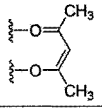
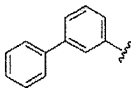
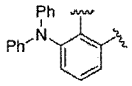
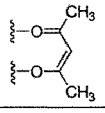
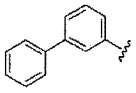
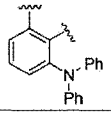
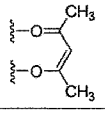
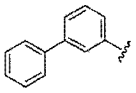
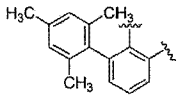
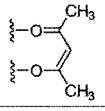
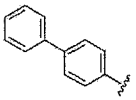
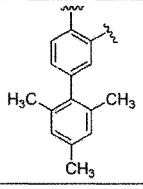
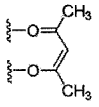
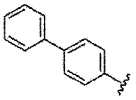
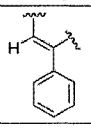
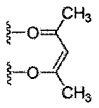
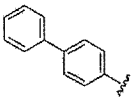
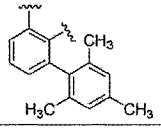
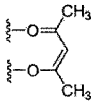
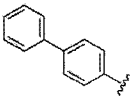
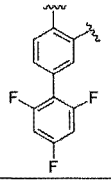
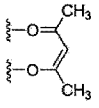
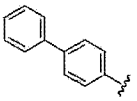
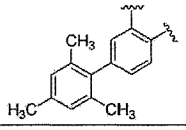
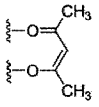
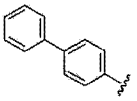
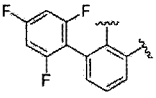
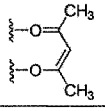
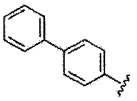
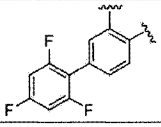
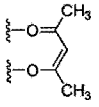
897	H	H	H	H					2
898	H	H	H	H					2
899	H	H	H	H					2
900	H	H	H	H					2
901	H	H	H	H					2
902	H	H	H	H					2
903	H	H	H	H					2
904	H	H	H	H					2
905	H	H	H	H					2
906	H	H	H	H					2

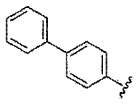
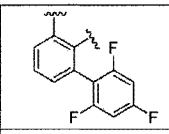
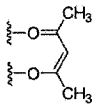
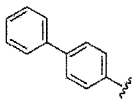
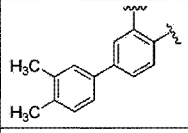
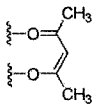
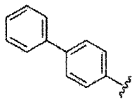
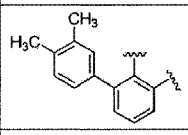
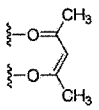
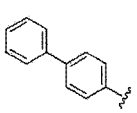
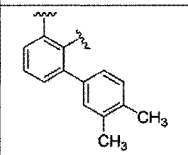
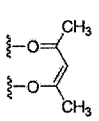
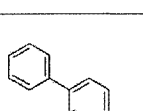
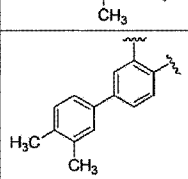
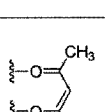
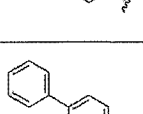
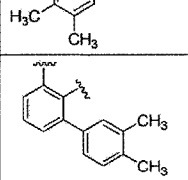
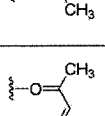
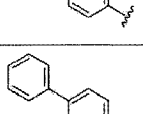
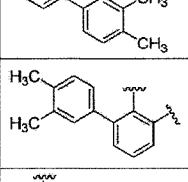
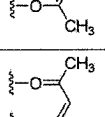
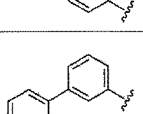
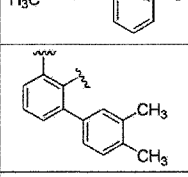
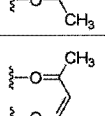
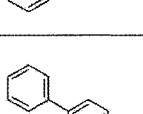
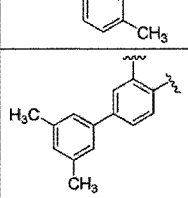
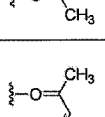
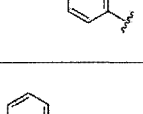
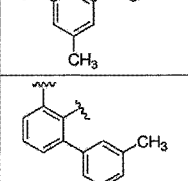
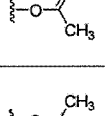
907	H	H	H	H					2
908	H	H	H	H					2
909	H	H	H	H					2
910	H	H	H	H					2
911	H	H	H	H					2
912	H	H	H	H					2
913	H	H	H	H					2
914	H	H	H	H					2
915	H	H	H	H					2

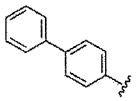
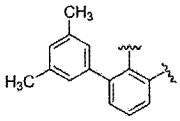
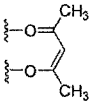
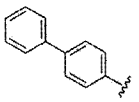
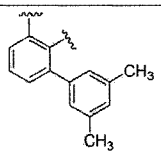
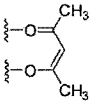
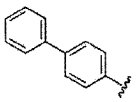
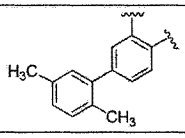
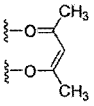
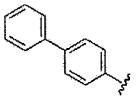
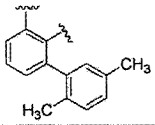
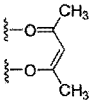
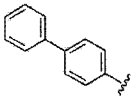
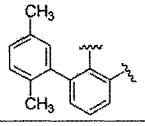
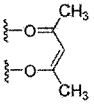
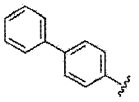
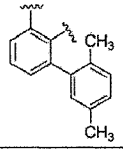
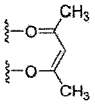
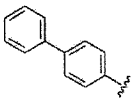
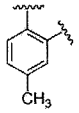
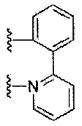
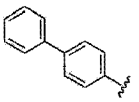
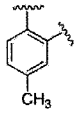
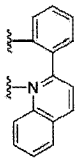
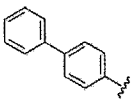
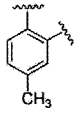
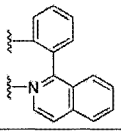
916	H	H	H	H					2
917	H	H	H	H					2
918	H	H	H	H					2
919	H	H	H	H					2
920	H	H	H	H					2
921	H	H	H	H					2
922	H	H	H	H					2
923	H	H	H	H					2
924	H	H	H	H					2

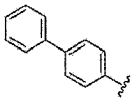
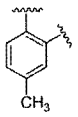
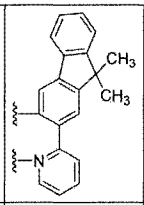
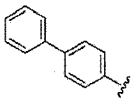
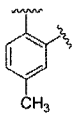
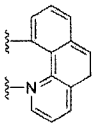
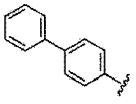
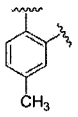
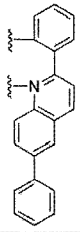
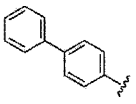
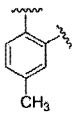
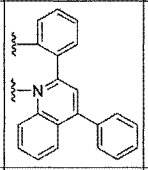
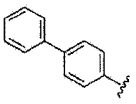
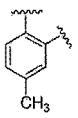
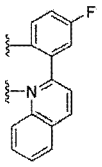
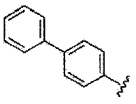
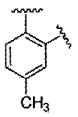
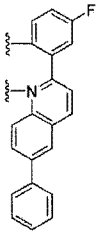
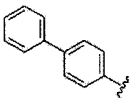
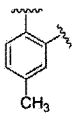
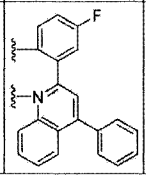
925	H	H	H	H					2
926	H	H	H	H					2
927	H	H	H	H					2
928	H	H	H	H					2
929	H	H	H	H					2
930	H	H	H	H					2
931	H	H	H	H					2
932	H	H	H	H					2

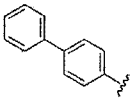
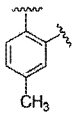
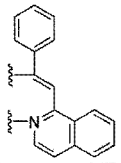
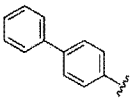
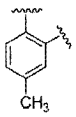
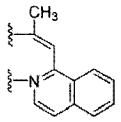
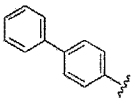
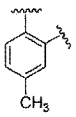
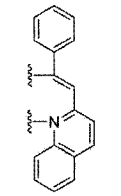
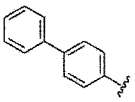
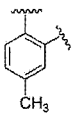
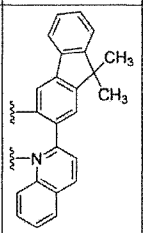
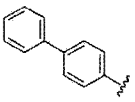
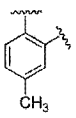
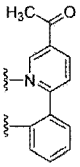
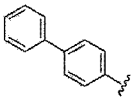
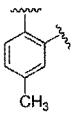
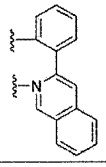
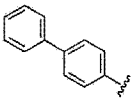
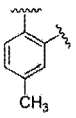
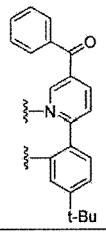
933	H	H	H	H					2
934	H	H	H	H					2
935	H	H	H	H					2
936	H	H	H	H					2
937	H	H	H	H					2
938	H	H	H	H					2
939	H	H	H	H					2
940	H	H	H	H					2
941	H	H	H	H					2

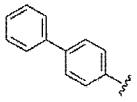
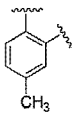
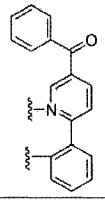
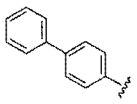
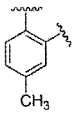
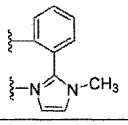
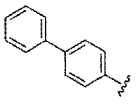
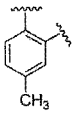
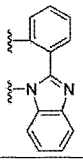
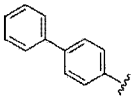
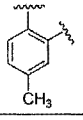
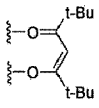
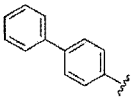
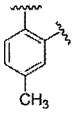
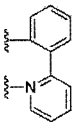
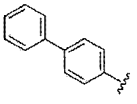
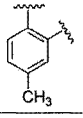
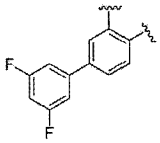
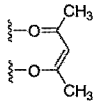
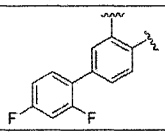
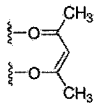
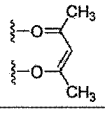
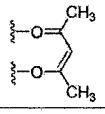
942	H	H	H	H					2
943	H	H	H	H					2
944	H	H	H	H					2
945	H	H	H	H					2
946	H	H	H	H					2
947	H	H	H	H					2
948	H	H	H	H					2
949	H	H	H	H					2
950	H	H	H	H					2
951	H	H	H	H					2

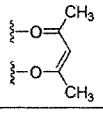
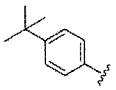
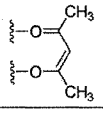
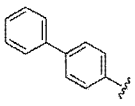
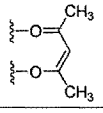
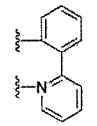
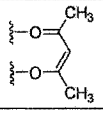
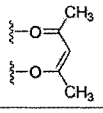
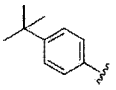
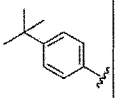
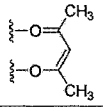
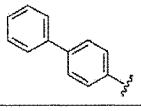
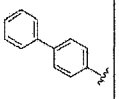
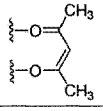
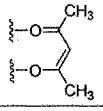
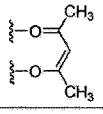
952	H	H	H	H					2
953	H	H	H	H					2
954	H	H	H	H					2
955	H	H	H	H					2
956	H	H	H	H					2
957	H	H	H	H					2
958	H	H	H	H					2
959	H	H	H	H					2
960	H	H	H	H					2
961	H	H	H	H					2

962	H	H	H	H					2
963	H	H	H	H					2
964	H	H	H	H					2
965	H	H	H	H					2
966	H	H	H	H					2
967	H	H	H	H					2
968	H	H	H	H					2
969	H	H	H	H					2
970	H	H	H	H					2

971	H	H	H	H					2
972	H	H	H	H					2
973	H	H	H	H					2
974	H	H	H	H					2
975	H	H	H	H					2
976	H	H	H	H					2
977	H	H	H	H					2

978	H	H	H	H					2
979	H	H	H	H					2
980	H	H	H	H					2
981	H	H	H	H					2
982	H	H	H	H					2
983	H	H	H	H					2
984	H	H	H	H					2

985	H	H	H	H					2
986	H	H	H	H					2
987	H	H	H	H					2
988	H	H	H	H					2
989	H	H	H	H					1
990	H	H	H	H				–	3
991	H	H	H	H					2
992	H	H	H	H					2
993	H	H	H	H					2
994	H	H	H	H					2

995	H	H	H	H					2
996	H	H	H	H					2
997	H	H	H	H					2
998	H	H	H	H					2
999	H	H	H	H					2
1000	H	H	H	H					2
1001	H	H	H	H					2
1002	H	H	H	H					2
1003	H	H	H	H					2
1004	H	H	H	H					2
1005	H	H	H	H					2
1006	H	H	H	H					2

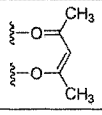
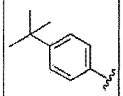
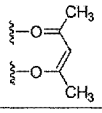
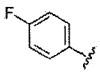
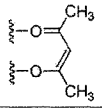
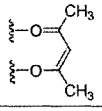
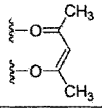
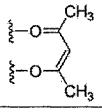
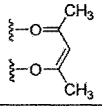
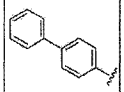
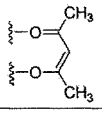
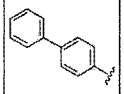
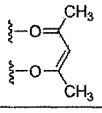
1007	H	H	H	H				–	3
1008	$-CH_3$	H	H	H					2
1009	H	$-CH_3$	H	H					2
1010	H	H	$-CH_3$	H					2
1011	H	H	H	$-CH_3$					2
1012	F	H	H	H					2
1013	H	F	H	H					2
1014		H	H	H					2
1015	H	H	H	H					2
1016	H	H	H	H					2
1017	$-CH_3$	H	H	H					2

Table 2

compound No.	^{1}H NMR($CDCl_3$, 200 MHz)	MS/FAB	
		found	calculated
1	δ = 8.11(m, 2H), 7.90-7.83(m, 6H), 7.64(s, 2H), 7.48(m, 8H), 7.32(m, 8H), 7.22-7.15(m, 8H), 4.58(s, 1H), 2.36(s, 6H), 2.08(s, 6H)	1032	1032.26
2	δ = 8.11(m, 2H), 7.97(m, 2H), 7.90(m, 2H), 7.83(m, 2H), 7.64(s, 2H), 7.48 (m, 8H), 7.32(m, 8H), 7.22(m, 4H), 7.06(m, 4H), 4.60(s, 1H), 2.05(s, 6H)	1040	1040.18
4	δ = 8.11(m, 2H), 7.91-7.90(m, 4H), 7.83(m, 2H), 7.64(s, 2H), 7.48(m, 8H), 7.38-7.32(m, 12H), 7.22(m, 4H), 4.59(s, 1H). 2.08(s, 6H), 1.34(s, 18H)	1116	1116.41
10	δ = 8.40(m, 2H), 8.11(m, 2H), 7.90(m, 2H), 7.83-7.76(m, 4H), 7.67-7.64(m, 6H), 7.48(m, 8H), 7.32-7.22(m, 16H), 4.59(s, 1H), 2.09(s, 6H)	1104	1104.32

(continued)

compound No.	^{1}H NMR($CDCl_3$, 200 MHz)	MS/FAB	
		found	calculated
12	δ = 8.28(s, 2H), 8.11(m, 2H), 7.93-7.83(m, 8H), 7.64(m, 2H), 7.55-7.48(m, 10H), 7.38-7.22(m, 16H), 4.58(s, 1H), 2.08(s, 6H), 1.67(s, 12H)	1236	1236.52
25	δ = 8.11-8.05(m,4H), 7.90(m, 2H), 7.83(m, 2H), 7.64(s, 2H), 7.57(m, 4H), 7.48(m, 12H), 7.32-7.22(m, 18H), 4.58(s, 1H), 2.05(s, 6H)	1156	1156.39
44	δ = 8.11(m, 2H), 7.90(m, 2H), 7.83(m, 2H), 7.64-7.60(m, 4H), 7.48(m, 8H), 7.32(m, 8H), 7.22(m, 4H), 6.88(s, 2H), 4.62(s, 1H), 2.35(s, 12H), 2.09(s, 6H)	1060	1060.31
51	δ = 8.11 (m, 2H), 7.90(m, 2H), 7.83-7.70(m, 4H), 7.64(s, 2H), 7.48(m, 8H), 7,33-7.32(m, 10H), 7.22(m, 4H), 6.99(m, 2H), 4.59(s, 1H), 2.08(s, 6H)	1040	1040.18
104	δ = 8.21(m, 4H), 8.04(m, 2H); 7.90(m. 4H), 7.79(m, 2H), 7.64-7.60(m, 4H). 7.54-7.41(m, 28H), 4.60(s, 1H), 2.01(s, 6H)	1156	1156.39
133	δ = 8.21(d, 2H), 8.11(m, 2H), 7.90-7.77(m, 10H), 7.64-7.50(m, 8H), 7.48-7.28 (m, 26H), 4.59(s, 1H), 2.05(s, 6H), 1.67(s, 12H)	1388	1388.71
176	δ = 8.56(m, 1H), 8.11(d, 2H), 7.99(m, 1H), 7.90-7.83(m, 6H), 7.64(m, 2H), 7.54-7.47(m, 10H), 7.35-7.15(m, 19H), 6.98(m, 1H), 2.35(s, 6H)	1087	1087.34
182	δ = 8.11-7.99(m, 4H), 7.90-7.83(m, 6H), 7.68-7.61(m, 5H), 7.48-7.32(m, 23H), 7.28-7.22(m, 6H), 7.15(m, 4H), 2.35(s, 6H)	1213	1213.49
198	δ = 8.11(d, 3H), 7.90-7.83(m, 9H), 7.64(s, 3H), 7.48(m, 12H), 7.32-7.22(m, 18H), 7.15(m, 6H), 2.35(s, 9H)	1303	1303.61
242	δ = 8.11(d, 2H), 7.90-7.83(m, 4H), 7.64-7.60(m, 4H), 7.48(m, 8H), 7.32(m, 4H), 7.22(m, 2H), 7.03(m, 4H), 6.88(d, 2H), 4.59(s, 1H), 2.35(s, 12H), 2.09 (s, 6H)	1096	1096.29
302	δ = 8.21(s, 2H), 8.11(m, 2H), 7.90(m, 2H), 7.83(m, 2H), 7.64(d, 2H), 7.50-7.32(m, 24H), 7.22(m, 4H), 7.03(m, 4H), 4.58(s, 1H), 2.10(s, 6H)	1192	1192.37
432	δ = 8.11-8.05(m, 4H), 7.90-7.77(m, 10H), 7.64-7.48(m, 14H), 7.38-7.22(m, 14H), 7.12(m, 4H), 4.60(s, 1H), 2.36(s, 6H), 2.09(s, 6H), 1.67(s, 12H)	1416	1416.77
440	δ = 8.11(m, 2H), 7.90(m, 2H), 7.83(m, 2H), 7.64-7.60(m, 4H), 7.48(m, 4H), 7.36-7.32(m, 8H), 7.22(m, 2H), 7.12(m, 4H), 6.88(m, 2H), 4.58(s, 1H), 2.35 (s, 18H), 2.09(s, 6H)	1088	1088.36
604	δ = 8.40(d, 2H), 8.11(m, 2H), 7.90-7.83(m, 4H), 7.76(m, 2H), 7.67-7.64(m, 6H), 7.48(m, 4H), 7.40-7.32(m, 16H)7.22(m, 2H), 4.59(s, 1H), 2.09(s, 6H), 1.34(s, 18H)	1216	1216.53
645	δ = 8.11(m,2H), 7.90(m, 2H), 7.83(m, 2H), 7.70(m, 2H), 7.64(m, 2H), 7.48 (m, 4H), 7.40-7.32(m, 14H), 7.22(m, 2H), 6.99(m, 2H), 4.60(s, 1H), 2.14(s, 6H), 1.35(s, 18H)	1152	1152.4
793	δ = 8.11(m, 2H), 7.90-7.83(m, 6H), 7.64(s, 2H), 7.54-7.48(m, 16H), 7.32(m, 8H), 7.22-7.15(m, 8H), 4.60(s, 1H), 2.36(s, 6H), 2.11(s, 6H)	1184	1184.45
998	δ = 8.56(m, 1H), 8.11(m, 2H), 7.99(m, 3H), 7.90(m, 2H), 7.83(m, 2H), 7.64 (s, 2H), 7.54-7.48(m, 10H), 7.35-7.22(m, 21H), 6.90(m, 1H)	1059	1059.28
1000	δ = 8.11(m, 2H), 7.99(m, 2H), 7.90(m, 2H), 7.83(m, 2H), 7.64(s, 2H), 7.36-7.28(m, 14H), 7.12(m, 8H), 4.58(s, 1H), 2.37(s, 12H). 2.09(s, 6H)	1060	1060.31
1007	δ = 8.11(m, 3H), 7.99-7.90(m, 6H), 7.83(m, 3H), 7.64(m, 3H), 7.48(m, 12H), 7.35-7.22(m, 27H)	1261	1261.53
1012	δ = 8.0-7.7(m, 4H), 7.6-7.48(m, 12H), 7.32-7.30(m, 14H), 7.23-7.21(m, 4H), 6.10(s, 1H), 2.30(s, 3H), 1.71(s, 3H)	1040	1040.18

(continued)

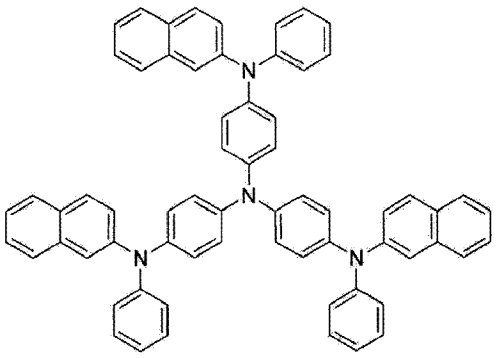
compound No.	^{1}H NMR($CDCl_3$, 200 MHz)	MS/FAB	
		found	calculated
1014	6 = 8.0-7.6(m, 8H), 7.48-7.30(m, 18H), 7.22-7.12(m, 6H), 6.10(s, 1H), 2.72 (m, 2H), 2.35(s, 6H), 2.30(s, 3H), 1.86-1.43(m, 23H)	1196	1196.54
1017	δ = 8.0-7.6(m, 8H), 7.54-7.48(m, 16H), 7.32-7.22(m, 18H), 6.10(s, 1H), 2.35 (s, 6H), 2.30(s, 3H), 1.71(s, 3H)	1184	1184.45

[Example 1] Manufacture of an OLED (1)

[0063] An OLED device was manufactured by using an organic electroluminescent compound according to the invention.

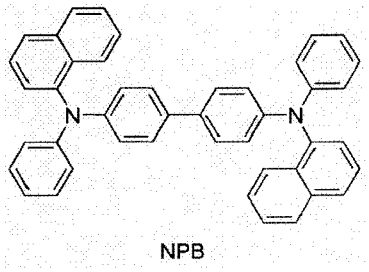
[0064] First, a transparent electrode ITO thin film (15 Ω/□) (2) prepared from glass for OLED (produced by Samsung Corning) (1) was subjected to ultrasonic washing with trichloroethylene, acetone, ethanol and distilled water, sequentially, and stored in isopropanol before use.

[0065] Then, an ITO substrate was equipped in a substrate folder of a vacuum vapor-deposit device, and 4,4',4"-tris (N,N-(2-naphthyl)-phenylamino)triphenylamine (2-TNATA) was placed in a cell of the vacuum vapor-deposit device, which was then ventilated up to 10^{-6} torr of vacuum in the chamber. Electric current was applied to the cell to evaporate 2-TNATA, thereby providing vapor-deposit of a hole injection layer (3) having 60 nm of thickness on the ITO substrate.



2-TNATA

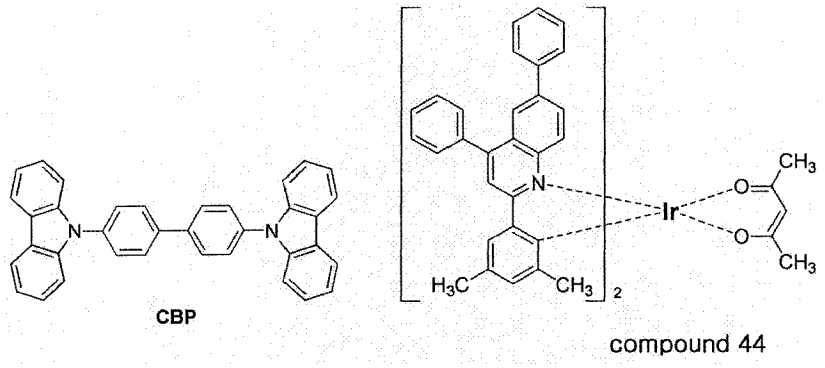
[0066] Then, to another cell of the vacuum vapor-deposit device, charged was N,N'-bis(α-naphthyl)-N,N'-diphenyl-4,4'-diamine (NPB), and electric current was applied to the cell to evaporate NPB, thereby providing vapor-deposit of a hole transport layer (4) of 20 nm of thickness on the hole injection layer.



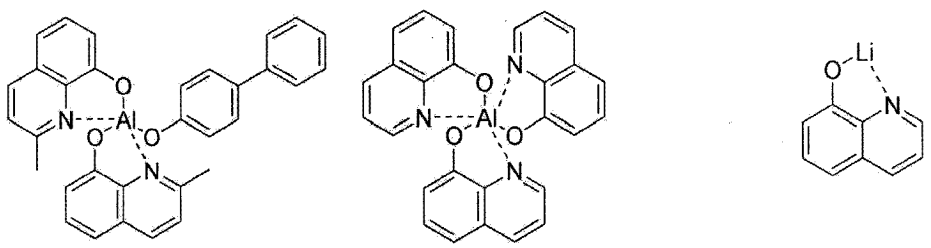
NPB

[0067] In another cell of said vacuum vapor-deposit device, charged was 4,4'-N,N'-dicarbazole-biphenyl (CBP) as an electroluminescent host material, and an organic electroluminescent compound (Compound 44) according to the present invention was charged to still another cell. The two materials were evaporated at different rates to carry out doping to vapor-deposit an electroluminescent layer (5) having 30 nm of thickness on the hole transport layer. The suitable doping

concentration is 4 to 10 mol% on the basis of CBP.



[0068] Then, on the electroluminescent layer, bis(2-methyl-8-quinolinato)(p-phenylphenolato)aluminum (III) (BAlq) was vapor-deposited as a hole blocking layer in a thickness of 10 nm in the same manner for NPB, trips(8-hydroxyquinoline)aluminum (III) (Alq) was vapor-deposited as an electron transport layer (6) in a thickness of 20 nm, and then lithium quinolate (Liq) was vapor-deposited as an electron injection layer (7) in a thickness of 1 to 2 nm. Thereafter, an Al cathode (8) was vapor-deposited in a thickness of 150 nm by using another vacuum vapor-deposit device to manufacture an OLED.



[Example 2] Manufacture of an OLED (2)

[0069] An hole injection layer and a hole transport layer were formed according to the procedure of Example 1, and an electroluminescent layer was vapor-deposited as follows. In another cell of said vacuum vapor-deposit device, charged was H-2 as an electroluminescent host material according to the invention, and an organic electroluminescent compound (Compound 12) according to the present invention was charged to still another cell. The two materials were evaporated at different rates to carry out doping to vapor-deposit an electroluminescent layer (5) having 30 nm of thickness on the hole transport layer. The suitable doping concentration is 4 to 10 mol% on the basis of the host. Then, a hole blocking layer, an electron transport layer and an electron injection layer were vapor-deposited according to the same procedure as in Example 1, and then Al cathode was vapor-deposited in a thickness of 150 nm by using another vacuum vapor-deposit device to manufacture an OLED.

[Example 3] Manufacture of an OLED (3)

[0070] A hole injection layer, a hole transport layer and an electroluminescent layer were formed according to the same procedure as in Example 2, and then an electron transport layer and an electron injection layer were vapor-deposited. Thereafter, Al cathode was vapor-deposited in a thickness of 150 nm by using another vacuum vapor-deposit device to manufacture an OLED.

[0071] In order to confirm the performance of the OLED's prepared according to Examples 1 to 3, the luminous efficiency of the OLED's was measured at 10 mA/cm^2. Various properties are shown in Tables 3.

Table 3

	Material	Host	Hole blocking layer	EL color	Operation voltage	Max. luminous efficiency (cd/A)
Ex. 1	Compound 44	CBP	BAlq	Red	7.9	8.6
	Compound 53	CBP	BAlq	Red	8.0	9.7
	Compound 176	CBP	BAlq	Red	8.2	10.4
	Compound 188	CBP	BAlq	Red	8.1	10.7
	Compound 335	CBP	BAlq	Red	8.2	10.9
	Compound 575	CBP	BAlq	Red	8.3	8.8
	Compound 584	CBP	BAlq	Red	8.0	11.0
	Compound 589	CBP	BAlq	Red	8.0	10.5
	Compound 787	CBP	BAlq	Red	7.7	11.2
	Compound 835	CBP	BAlq	Red	7.8	10.7
	Compound 968	CBP	BAlq	Red	8.0	10.4
	Compound 979	CBP	BAlq	Red	8.1	10.5
Ex. 2	Compound 12	H-2	BAlq	Red	8.3	8.0
	Compound 53	H-8	BAlq	Red	7.6	9.6
	Compound 787	H-40	BAlq	Red	7.8	11.1
Ex. 3	Compound 1	H-4	-	Red	6.8	8.6
	Compound 835	H-7	-	Red	6.6	10.7
	Compound 787	H-40	-	Red	6.8	11.3

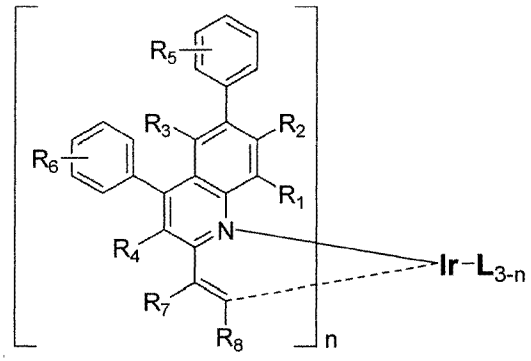
[0072] Compound (176) and Compound (188), to which ppy and styrylquinoline were introduced as a subsidiary ligand, respectively, showed high luminous efficiency of 10 cd/A or more. Compound (335), to which F was applied to a ligand as an electron withdrawer, showed the effect of increased efficiency. Compound (787), which employs phenyl(6-phenylpyridin-3-yl)methanone as a subsidiary ligand, showed the highest efficiency among the compounds developed by the present invention.

[0073] With identical device structure, using the host according to the present invention instead of CBP resulted in substantially identical efficiency and operation voltage. Thus, it is anticipated that those hosts can replace CBP. When the host according to the present invention is employed without using a hole blocking layer, the device exhibits comparable or higher luminous efficiency as compared to that using conventional host, and provides decreased power consumption of the OLED due to lowered operation voltage by at least 0.9 V. If the invention is applied to mass production of OLED's, the time for mass production can be also reduced to give great benefit on its commercialization.

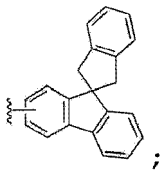
Claims

1. An organic electroluminescent compound represented by Chemical Formula (1):

Chemical Formula 1



wherein, L is an organic ligand;
R_1 through R_4 independently represent hydrogen, (C1-C60)alkyl, (C1-C60)alkoxy, (C3-C60)cycloalkyl, halogen, tri(C1-C60)alkylsilyl or tri(C6-C60)arylsilyl;
R_5 and R_6 independently represent hydrogen, (C1-C60)alkyl, halogen or (C6-C60)aryl;
R_7 and R_8 independently represent hydrogen, (C1-C60)alkyl with or without halogen substituent(s), (C6-C60)aryl, halogen, cyano, tri(C1-C60)alkylsilyl, tri(C6-C60)arylsilyl, (C1-C60)alkoxy, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, di(C1-C60)alkylamino or di(C6-C60)arylamino, or R_7 and R_8 may be linked via (C3-C12)alkylene or (C3-C12)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring;
the alkyl, aryl of R_7 and R_8, or the alicyclic ring, or the monocyclic or polycyclic aromatic ring formed therefrom by linkage via (C3-C12)alkylene or (C3-C12)alkenylene with or without a fused ring may be further substituted by one or more substituent(s) selected from (C1-C60)alkyl with or without halogen substituent(s), halogen, cyano, tri(C1-C60)alkylsilyl, tri(C6-C60)arylsilyl, (C1-C60)alkoxy, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, di(C1-C60)alkylamino, di(C6-C60)arylamino, phenyl, naphthyl, anthryl, fluorenyl, spirobifluorenyl and

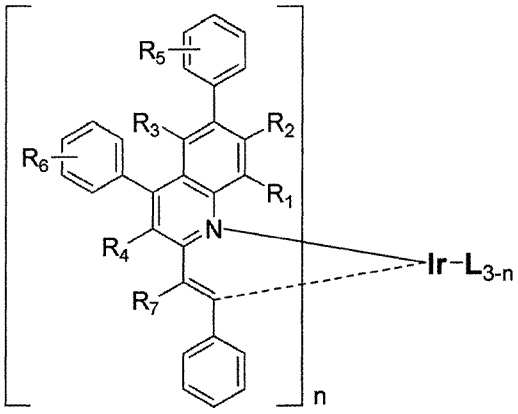


;

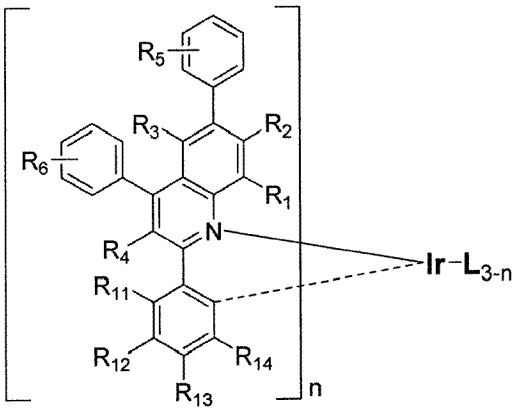
and
n is an integer from 1 to 3.

2. The organic electroluminescent compound according to claim 1, which is selected from the compounds represented by one of Chemical Formulas (2) to (7):

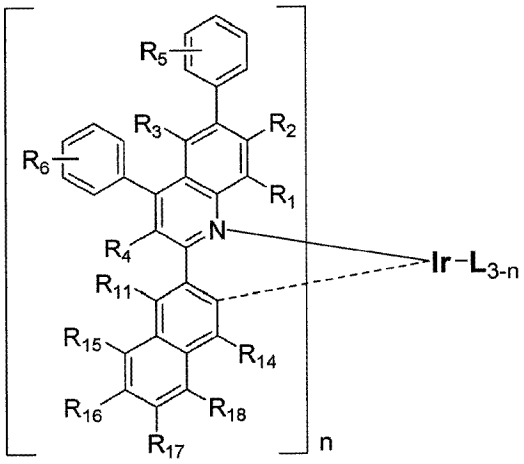
Chemical Formula 2



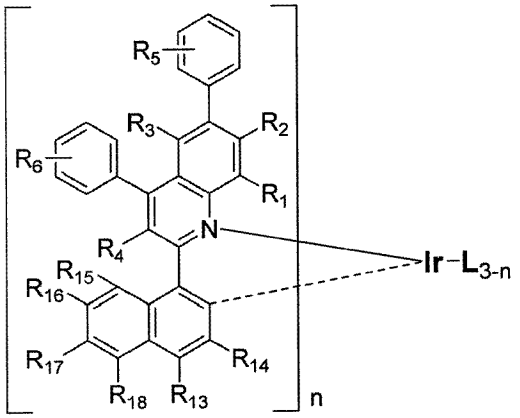
Chemical Formula 3



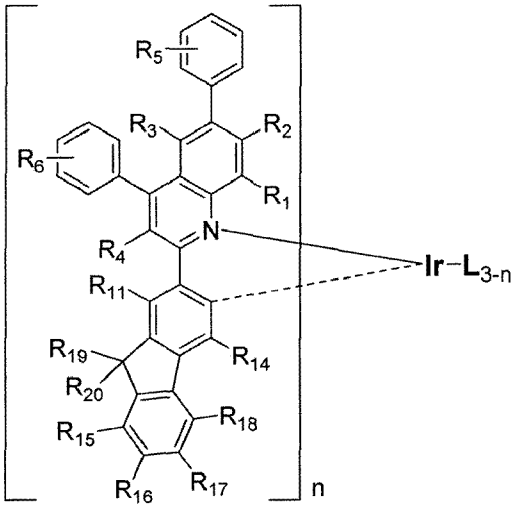
Chemical Formula 4



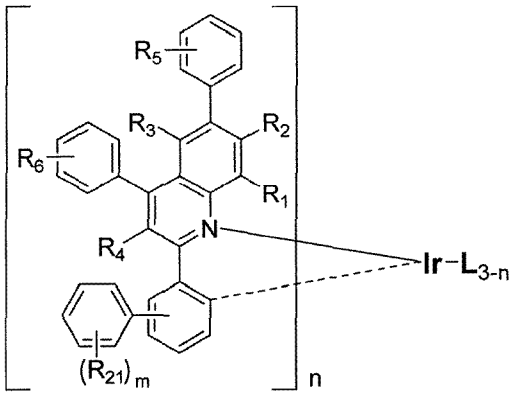
Chemical Formula 5



Chemical Formula 6

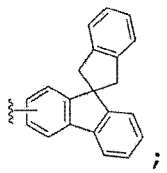


Chemical Formula 7



wherein, L, R_1, R_2, R_3, R_4, R_5, R_6, R_7 and n are defined as in Claim 1;

R_{11} through R_{18} independently represent hydrogen, (C1-C60)alkyl, halogen, cyano, tri(C1-C60)alkylsilyl, tri(C6-C60)arylsilyl, (C1-C60)alkoxy, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, di(C1-C60)alkylamino, di(C6-C60)arylamino, phenyl, naphthyl, anthryl, fluorenyl, spirobifluorenyl or



;

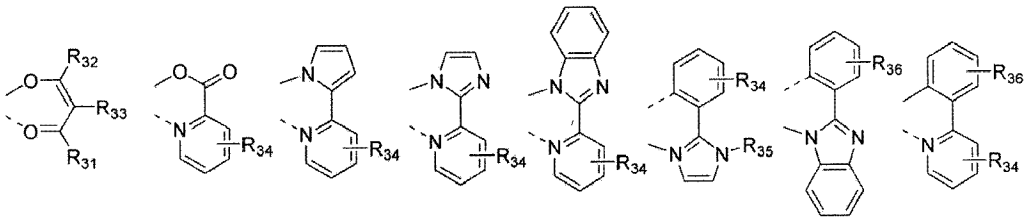
the alkyl, phenyl, naphthyl, anthryl or fluorenyl of R_{11} through R_{18} may be further substituted by one or more substituent(s) selected from (C1-C60)alkyl with or without halogen substituent(s), (C1-C60)alkoxy, halogen, tri(C1-C60)alkylsilyl, tri(C6-C60)arylsilyl, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, di(C1-C60)alkylamino, di(C6-C60)arylamino and (C6-C60)aryl;

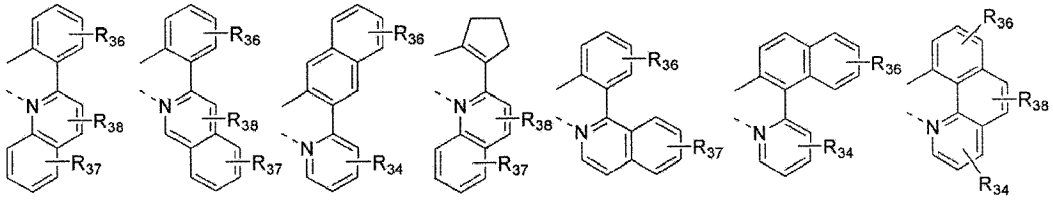
R_{19} and R_{20} independently represent hydrogen, (C1-C60)alkyl or (C6-C60)aryl, or R_{19} and R_{20} may be linked via (C3-C12)alkylene or (C3-C12)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring;

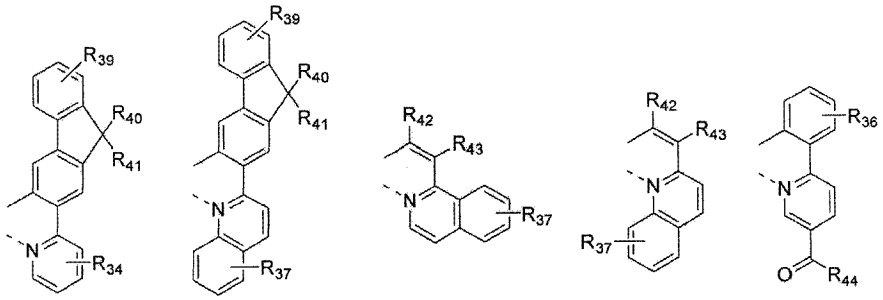
R_2, represents (C1-C60)alkyl, halogen, cyano, tri(C1-C60)alkylsilyl, tri(C6-C60)arylsilyl, (C1-C60)alkoxy, (C1-C60)

alkylcarbonyl, (C6-C60)arylcarbonyl, phenyl, di(C1-C60)alkylamino, di(C6-C60)arylamino, naphthyl, 9,9-di(C1-C60) alkylfluorenyl or 9,9-di(C6-C60)arylfluorenyl; and
m is an integer from 1 to 5.

3. The organic electroluminescent compound according to claim 1, wherein the ligand (L) has a structure represented by one of the following chemical formulas:



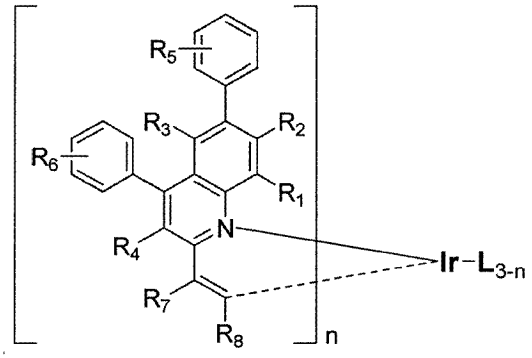




wherein, R_{31} and R_{32} independently represent hydrogen, (C1-C60)alkyl with or without halogen substituent(s), phenyl with or without (C1-C60)alkyl substituent(s), or halogen;
R_{33} through R_{39} independently represent hydrogen, (C1-C60)alkyl, phenyl with or without (C1-C60)alkyl substituent (s), tri(C1-C60)alkylsilyl or halogen;
R_{40} through R_{43} independently represent hydrogen, (C1-C60)alkyl, phenyl with or without (C1-C60)alkyl substituent (s); and
R_{44} represents (C1-C60)alkyl, phenyl with or without (C1-C60)alkyl substituent(s), or halogen.

4. An organic electroluminescent device which is comprised of a first electrode; a second electrode; and at least one organic layer(s) interposed between the first electrode and the second electrode; wherein the organic layer comprises an electroluminescent region comprising an organic electroluminescent compound represented by Chemical Formula (1):

Chemical Formula 1



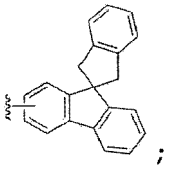
wherein, L is an organic ligand;

R_1 through R_4 independently represent hydrogen, (C1-C60)alkyl, (C1-C60)alkoxy, (C3-C60)cycloalkyl, halogen, tri(C1-C60)alkylsilyl or tri(C6-C60)arylsilyl;

R_5 and R_6 independently represent hydrogen, (C1-C60)alkyl, halogen or (C6-C60)aryl;

R_7 and R_8 independently represent hydrogen, (C1-C60)alkyl with or without halogen substituent(s), (C6-C60)aryl, halogen, cyano, tri(C1-C60)alkylsilyl, tri(C6-C60)arylsilyl, (C1-C60)alkoxy, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, di(C1-C60)alkylamino or di(C6-C60)arylamino, or R_7 and R_8 may be linked via (C3-C12)alkylene or (C3-C12)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring;

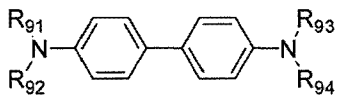
the alkyl, aryl of R_7 and R_8, or the alicyclic ring, or the monocyclic or polycyclic aromatic ring formed therefrom by linkage via (C3-C12)alkylene or (C3-C12)alkenylene with or without a fused ring may be further substituted by one or more substituent(s) selected from (C1-C60)alkyl with or without halogen substituent(s), halogen, cyano, tri(C1-C60)alkylsilyl, tri(C6-C60)arylsilyl, (C1-C60)alkoxy, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, di(C1-C60)alkylamino, di(C6-C60)arylamino, phenyl, naphthyl, anthryl, fluorenyl, spirobifluorenyl and



;

and n is an integer from 1 to 3, and one or more host(s) selected from 1,3,5-tricarbazolylbenzene, polyvinylcarbazole, m-biscarbazolylphenyl, 4,4'4"-tri(N-carbazolyl)triphenylamine, 1,3,5-tri(2-carbazolylphenyl)benzene, 1,3,5-tris(2-carbazolyl-5-methoxyphenyl) benzene, bis(4-carbazolylphenyl)silane and one or more host(s) represented by one of Chemical Formulas (8) to (11) :

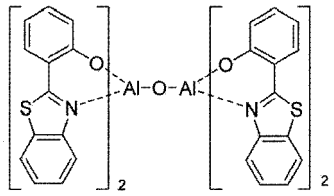
Chemical Formula 8



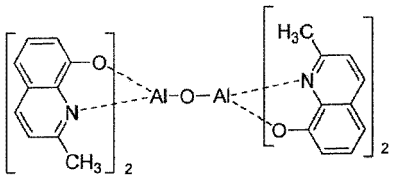
In Chemical Formula (8), R_{91} through R_{94} independently represent hydrogen, halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl, a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C1-C60)alkyloxy, (C1-C60)alkylthio, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkox-

ycarbonyl, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, carboxyl, nitro or hydroxyl, or each of R_{91} through R_{94} may be linked to an adjacent substituent via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring;
the alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, aryl, heteroaryl, arylsilyl, alkylsilyl, alkylamino, or arylamino of R_{91} through R_{94}, or the alicyclic ring, or the monocyclic or polycyclic aromatic ring formed therefrom by linkage to an adjacent substituent via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring may be further substituted by one or more substituent(s) selected from halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl, a 5-or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60) cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60) alkyl, (C1-C60)alkyloxy, (C1-C60)alkylthio, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, (C1-C60) alkylcarbonyl, (C6-C60)arylcarbonyl, carboxyl, nitro and hydroxyl.

Chemical Formula 9

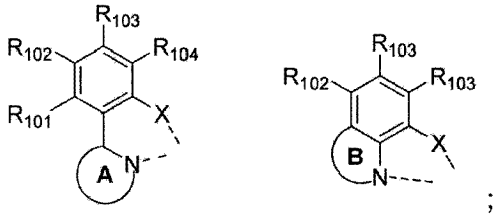


Chemical Formula 10



Chemical Formula 11 $L^1L^2M^1(Q)_y$

In Chemical Formula (11), the ligands, L^1 and L^2 are independently selected from the following structures:



;

M^1 is a bivalent or trivalent metal;
y is 0 when M^1 is a bivalent metal, while y is 1 when M^1 is a trivalent metal;
Q represents (C6-C60)aryloxy or tri(C6-C60)arylsilyl, and the aryloxy and triarylsilyl of Q may be further substituted by (C1-C60)alkyl or (C6-C60)aryl;
X represents O, S or Se;
ring A represents oxazole, thiazole, imidazole, oxadiazole, thiadiazole, benzoxazole, benzothiazole, benzimidazole, pyridine or quinoline;
ring B represents pyridine or quinoline, and ring B may be further substituted by (C1-C60)alkyl, or phenyl or naphthyl with or without (C1-C60)alkyl substituent(s);
R_{101} through R_{104} independently represent hydrogen, halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60)heteroaryl,

a 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60) cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60) alkyl, (C1-C60)alkyloxy, (C1-C60)alkylthio, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, (C1-C60) alkylcarbonyl, (C6-C60)arylcarbonyl, carboxyl, nitro or hydroxyl, or each of R_{101} through R_{104} may be linked to an adjacent substituent via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring, the pyridine or quinoline may form a chemical bond together with R_{101} to form a fused ring;
the alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, aryl, heteroaryl, arylsilyl, alkylsilyl, alkylamino, or arylamino of ring A and R_{101} through R_{104}, or the alicyclic ring, or the monocyclic or polycyclic aromatic ring formed therefrom by linkage to an adjacent substituent via (C3-C60)alkylene or (C3-C60)alkenylene with or without a fused ring may be further substituted by one or more substituent(s) selected from halogen, (C1-C60)alkyl, (C6-C60)aryl, (C4-C60) heteroaryl, a 5-or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O and S, (C3-C60)cycloalkyl, tri(C1-C60)alkylsilyl, di(C1-C60)alkyl(C6-C60)arylsilyl, tri(C6-C60)arylsilyl, adamantyl, (C7-C60)bicycloalkyl, (C2-C60)alkenyl, (C2-C60)alkynyl, cyano, (C1-C60)alkylamino, (C6-C60)arylamino, (C6-C60)ar(C1-C60)alkyl, (C1-C60)alkyloxy, (C1-C60)alkylthio, (C6-C60)aryloxy, (C6-C60)arylthio, (C1-C60)alkoxycarbonyl, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, carboxyl, nitro and hydroxyl.

5. The organic electroluminescent device according to claim 4, wherein the organic layer comprises one or more compound(s) selected from a group consisting of arylamine compounds and styrylarylamine compounds, or one or more metal(s) selected from a group consisting of organic metals of Group 1, Group 2, 4th period and 5th period transition metals, lanthanide metals and d-transition elements.

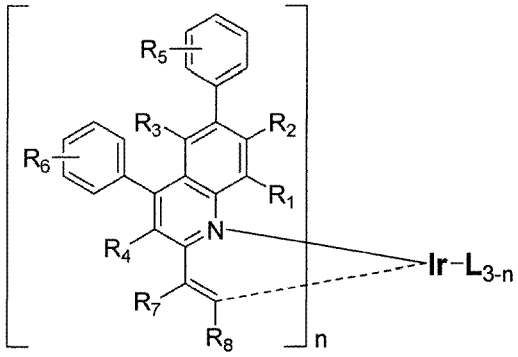
6. The organic electroluminescent device according to claim 4, having the electroluminescent peak with wavelength of blue and green at the same time.

7. The organic electroluminescent device according to claim 4, wherein the organic layer comprises an electroluminescent layer and a charge generating layer.

8. The organic electroluminescent device according to claim 4, wherein a mixed region of reductive dopant and organic substance, or a mixed region of oxidative dopant and organic substance is placed on the inner surface of one or both electrode(s) among the pair of electrodes.

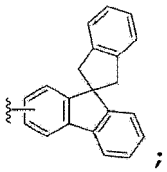
9. An organic solar cell which comprises an organic electroluminescent compound comprising an organic electroluminescent compound represented by Chemical Formula (1) :

Chemical Formula 1



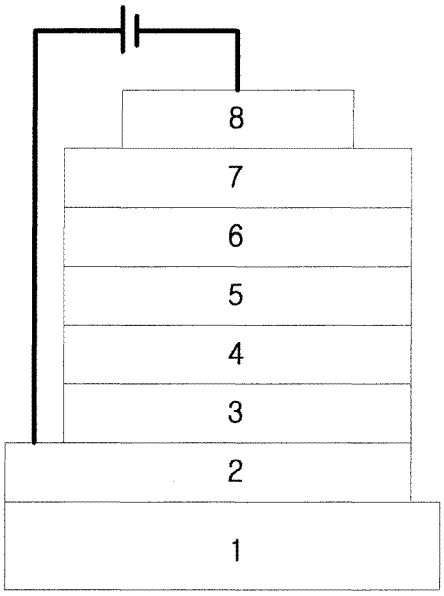
wherein, L is an organic ligand;
R_1 through R_4 independently represent hydrogen, (C1-C60)alkyl, (C1-C60)alkoxy, (C3-C60)cycloalkyl, halogen, tri(C1-C60)alkylsilyl or tri(C6-C60)arylsilyl;
R_5 and R_6 independently represent hydrogen, (C1-C60)alkyl, halogen or (C6-C60)aryl;

R_7 and R_8 independently represent hydrogen, (C1-C60)alkyl with or without halogen substituent(s), (C6-C60)aryl, halogen, cyano, tri(C1-C60)alkylsilyl, tri(C6-C60)arylsilyl, (C1-C60)alkoxy, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, di(C1-C60)alkylamino or di(C6-C60)arylamino, or R_7 and R_8 may be linked via (C3-C12)alkylene or (C3-C12)alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring;
the alkyl, aryl of R_7 and R_8, or the alicyclic ring, or the monocyclic or polycyclic aromatic ring formed therefrom by linkage via (C3-C12)alkylene or (C3-C12)alkenylene with or without a fused ring may be further substituted by one or more substituent(s) selected from (C1-C60)alkyl with or without halogen substituent(s), halogen, cyano, tri(C1-C60)alkylsilyl, tri(C6-C60)arylsilyl, (C1-C60)alkoxy, (C1-C60)alkylcarbonyl, (C6-C60)arylcarbonyl, di(C1-C60)alkylamino, di(C6-C60)arylamino, phenyl, naphthyl, anthryl, fluorenyl, spirobifluorenyl and


;

and
n is an integer from 1 to 3.

Fig. 1



REFERENCES CITED IN THE DESCRIPTION

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Non-patent literature cited in the description

- **A. TSUBOYAMA et al.** *J. Am. Chem. Soc.,* 2003, vol. 125 (42), 12971-12979 **[0004]**

专利名称(译)	新型红色电致发光化合物和使用其的有机电致发光器件		
公开(公告)号	EP2062959A2	公开(公告)日	2009-05-27
申请号	EP2008169471	申请日	2008-11-20
申请(专利权)人(译)	GRACEL显示增量.		
当前申请(专利权)人(译)	GRACEL显示增量.		
[标]发明人	KIM JIN HO EUM SUNG JIN CHO YOUNG JUN KWON HYUCK JOO KIM BONG OK KIM SUNG MIN YOON SEUNG SOO		
发明人	KIM, JIN HO EUM, SUNG JIN CHO, YOUNG JUN KWON, HYUCK JOO KIM, BONG OK KIM, SUNG MIN YOON, SEUNG SOO		
IPC分类号	C09K11/06 H05B33/14 C07D215/58 C07F15/00 H01L51/50 H01L51/00		
CPC分类号	C09K11/06 C07F15/0033 C09K2211/185 H01L51/0081 H01L51/0085 H01L51/42 H01L51/5016 H05B33/14 Y02E10/549		
优先权	1020070118281 2007-11-20 KR		
其他公开文献	EP2062959A3		
外部链接	Espacenet		

摘要(译)

本发明涉及具有高发光效率的新型有机电致发光化合物，以及包含该化合物的有机电致发光器件。根据本发明的有机电致发光化合物由化学式（1）表示：

Chemical Formula 1