

(19)
(12)

(KR)
(B1)

(51) 。 Int. Cl. 7
C09K 11/06
H05B 33/10

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(24)

2002 09 30
10 - 0354500
2002 09 13

(21) 10 - 2000 - 0052400
(22) 2000 09 05

(65) 2002 - 0019237
(43) 2002 03 12

(73)

1

2 39 - 1

(72)

2 - 38

320 108 - 606

5가159 - 4

1 1604 - 37 B 08

152 - 1 108 1007

994 203 1003

152 - 1 108 501

(74)

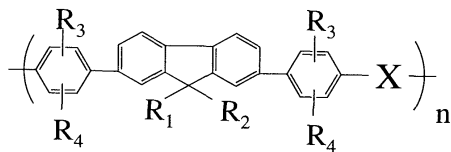
:

(54)

1

가 .

1



5

1	19	M - 19	¹ H - NMR	.
2	29	C - 3	¹ H - NMR	.
3	19	M - 19	UV - VIS PL	.
4	29	C - 3	UV - VIS PL	().
5	29	C - 3	EL	.
6		29	C - 3 EL	(/C - 3 = 8:2).

(Electroluminescence, EL)

1 가 , , .

EL
thiophene, PTh),
p36 (1992))

[Poly(phenylenevinylene), PPV], (Poly
(Synth. Met., 50(1 - 3), p491(1992), Adv. Mater., 4,
가

PPV PTh (Synth. Met., 62, p35 (1994), Adv. Mater, 4, p36 (1992), Macromolecules, 28, p752
5 (1995)

(Jpn. J. Appl. Phys., 30, pL1941 (1991))

EL

(176336 5,807,974) . ,

(Makromol. Chem., 191, p.857 (1990), Macromolecules, 27, p562

(1994), J. Chem. Soc., Chem. Commun., p1433 (1995), Macromolecules, 29, p5157 91996))

(Photoluminescence, PL) 가 (Sc

ience, 279, p835 (1998))

LED

(5,876,864) (Dyacetylene)

(Prog. Polym. Sci., 20, p943 (1995), CHEMTECH, October, p32 (1993), macromolecules, 29, p2 885 (1996)) 가

PL 가 EL

가 EL

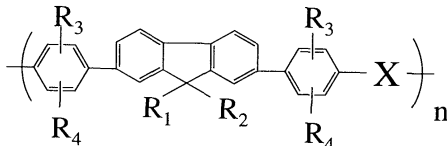
EL

1
EL LED

PL

가

1



[, R₁, R₂, R₃ R₄

가 6~18

가 1~22

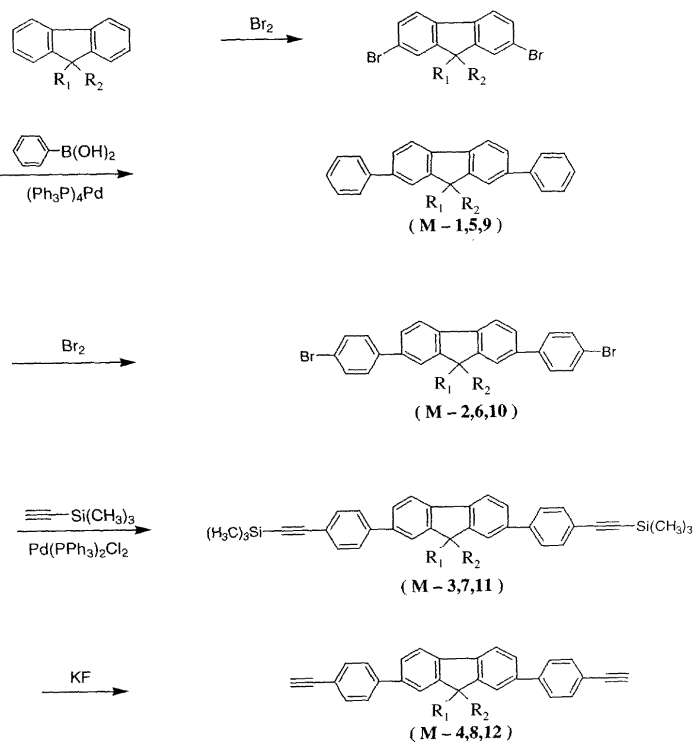
; , R₁ R₂

; X

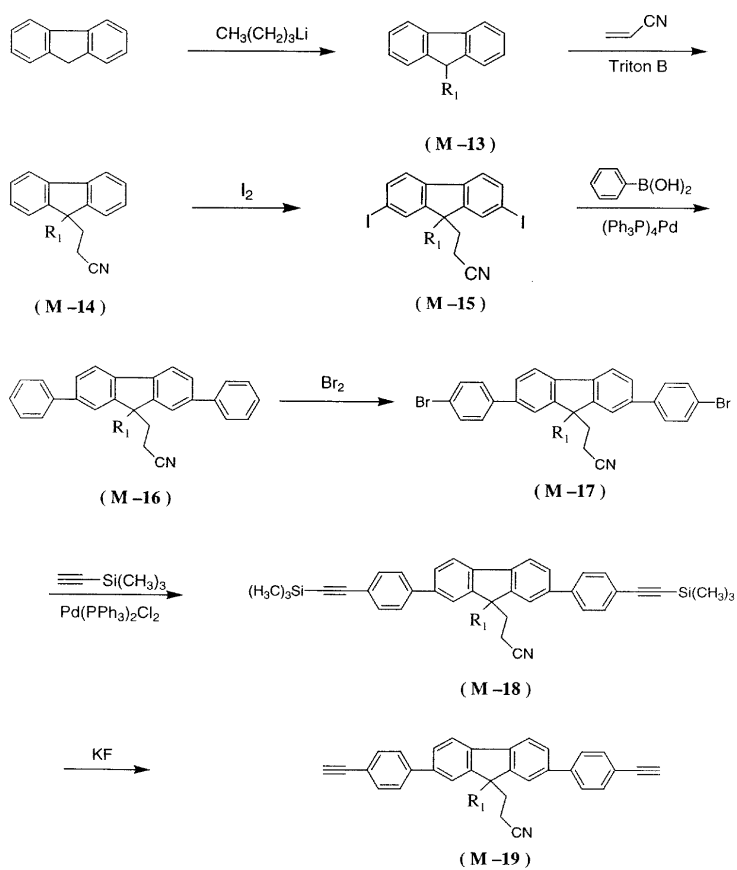
X

:

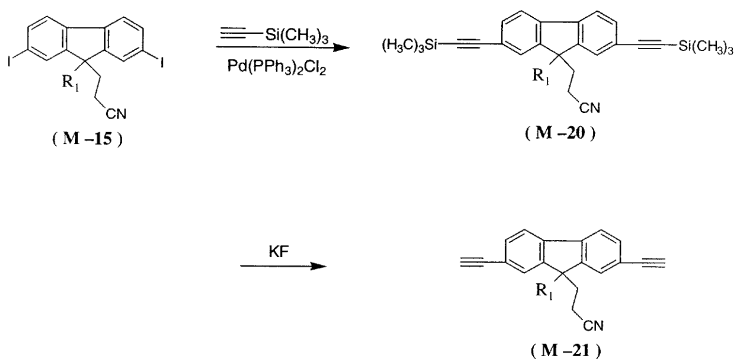
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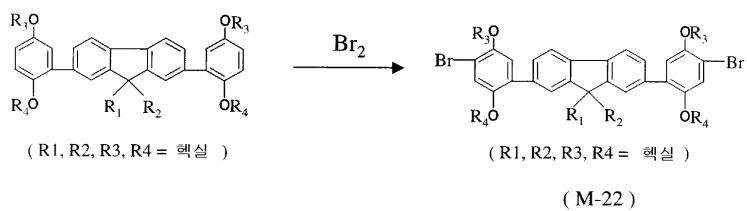


2

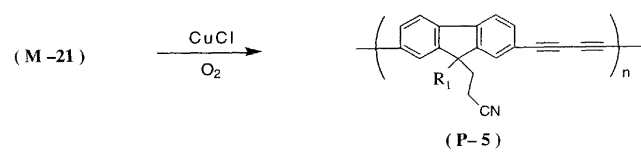
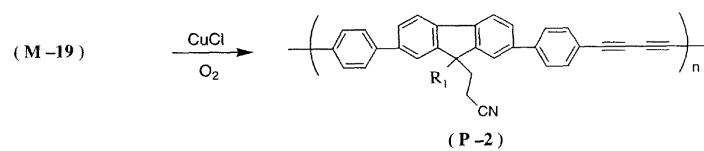
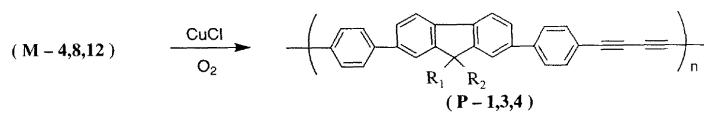


3

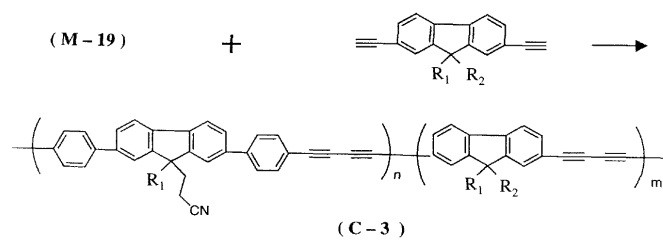
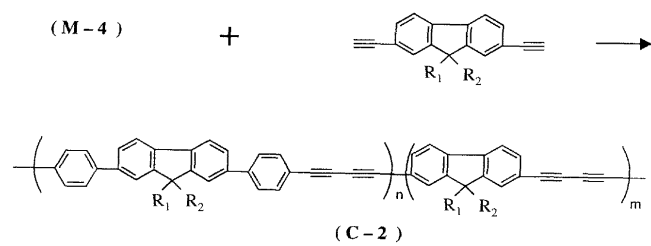
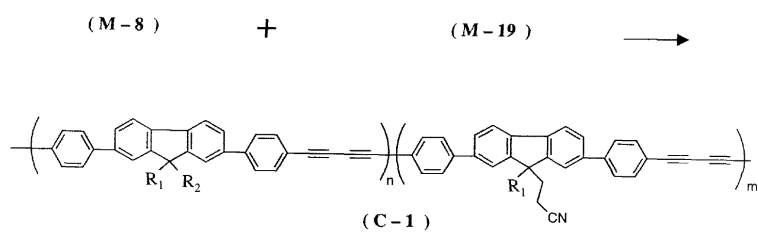




4



5



1

6



가 , THF, DMF

2

1

Heck

가

가

EL

(

2 - 135361

3 - 152184

6 - 207170)

/

/

/

/

ITO,

10

~ 1

가

, 2,5 -

(4' -

) - 1,3,4 -

N,N' -

- N,N' - (3 -

) - 1,1' -

- 4,4' -

(TPD)

(8 -

, 2 - (4' - tert -

) - 5 - (4" -

) - 1,3,4 -

, 2,4,7 -

- 9 -

LB

가

PPV

PTh

(1,4 -

- 2,5 -

)

(3 -

)

0.001 ~ 99%,

0.1 ~ 50 %가

5

~ 5

50

~ 1

가

가

, ABS,

가

가

1

가

1

2,7- (M-1)
 9,9' (0.2), 4 [C₆H₅B(OH)₂] 56.93 (0.467)
 2.35 (2.03) 500 2M
 Na₂CO₃] 250 48
 3 가 / (9:1)
 30 82 (82.9)
 65~66 .¹H-NMR (CDCl₃) 0.71 - 1.06 (m, 22H, CH₂, CH₃), 2.03 - 2.17 (m, 4H, CCH₂), 7.34 - 7.78 (m, 16H, Aromatic).

2

2,7- (4-) - 9,9' (M-2)
 가 1 3 2,7- - 9,9' - 50
 (0.1) 400 -5
 100 33.56 (0.21) 25 24
 20%
 - 40 가 . 2 가
 30 55 (83.66)
 121 - 123 .¹H-NMR (CDCl₃) 0.71 - 1.06 (m, 22H, CH₂, CH₃), 1.992.06 (m, 4H, CCH₂), 7.45 - 7.78 (m, 16H, Aromatic).

3

2,7- [4-(())] - 9,9' (M-3)
 가 1 3 2,7- (4-) -
 9,9' - - 20 (0.031), [(PPh₃)₂PdCl₂] 1.08
 (5), (CuI) 0.295 (5) 200
 7 (0.071) 70~80 3
 2
 3 / (10:1)
 2
 30
 16.25 (81%) 118 - 129 .¹H-NMR (CDCl₃) 0.29 (s, 18H, SiCH₃), 0.72 - 1.06 (m, 22H, CH₂, CH₃), 2.00 - 2.04 (m, 4H, CCH₂), 7.49 - 7.71 (m, 14H, Aromatic).

4

2,7- (4-) - 9,9' (M-4)

가 250 2,7- [4 - (())] - 9,9' - -
 4 (5.8) , 20 % 6 100
 6 50 가
 , 3
 / (4:1)
 2.82 (90%) 101 - 102 . ¹H - NMR (CD
 Cl₃) 0.78 - 1.42 (m, 22H, CH₂, CH₃), 2.02 - 2.1(m, 4H, CCH₂), 3.19(s, 2H, CH), 7.42 - 7.78 (m, 14H, A
 romatic).

5

2,7- - 9,9' - - - (M - 5)
 2,7- - 9,9' - - - 60 (0.09) 1
 55.66 (93.6%) 44 - 45 . ¹H - NMR (CDC
 l₃) 0.78 - 1.25 (m, 46H, CH₂, CH₃), 2.06 - 2.1(m, 4H, CCH₂), 7.41 - 7.78 (m, 16H, Aromatic).

6

2,7- (4 -) - 9,9' - - - (M - 6)
 2,7- - 9,9' - - - 20 (0.03) 2
 (1:1) 20.35 (81.9%)
 83 - 84 .H - NMR (CDCl₃) 0.68 - 1.19 (m, 40H, CH₂, 6H, CH₃), 1.98 - 2.06 (m, 4H, CCH₂), 7.51 - 7.7
 9 (m, 16H, Aromatic).

7

2,7- [4 - (())] - 9,9' - - -
 (M - 7)
 2,7- (4 -) - 9,9' - - - 10 (0.012) 3
 8.5 (8.15%)
 75 - 86 .¹H - NMR (CDCl₃) 0.25 (s, 18H, SiCH₃), 0.6 - 1.31 (m, 40H, CH₂, 6H,
 CH₃), 1.94 - 2.12 (m, 4H, CCH₂), 7.5 - 7.78 (m, 14H, Aromatic).

8

2,7- (4 -) - 9,9' - - - (M - 8)
 2,7- [4 - (())] - 9,9' - - - 5 (5.9)
 4 가 4.14 (96%)
 42 - 43 .¹H - NMR (CDCl₃) 0.71 - 1.22 (m, 40H, CH₂, 6H, CH₃), 2.02 - 2.18 (m,
 4H, CCH₂), 3.18 (s, 2H, CH), 7.59 - 7.84 (m, 14H, Aromatic).

9

2,7- - 9,9' - - - (M - 9)

2,7- -9,9' - - - 25 (0.03) 1
 가 21.67 (87.8%) 65 - 66 . ¹H - NMR (CDCl₃) 0.78
 - 1.25 (m, 56H, CH₂, 6H, CH₃), 1.99 - 2.08 (m, 4H, CCH₂), 7.26 - 7.80 (m, 16H, Aromatic).

10

2,7- (4-) -9,9' - - - (M - 10)

2,7- -9,9' - - - 15 (0.019) 2
 (1:1) 15.36 (84.4%)
 85 - 86 . ¹H - NMR (CDCl₃) 0.68 - 1.23 (m, 56H, CH₂, 6H, CH₃), 1.98 - 2.04 (m, 4H, CCH₂), 7.51 -
 7.79 (m, 16H, Aromatic).

11

2,7- [4 - (())] -9,9' - - -

(M - 11)

2,7- (4-) -9,9' - - - 10 (0.012) 3
 8.5 (81.5%)
 75 - 75 . ¹H - NMR (CDCl₃) 0.25 (s, 18H, SiCH₃), 0.6 - 1.31 (m,
 40H, CH₂, 6H, CH₃), 1.94 - 2.12 (m, 4H, CCH₂), 7.5 - 7.78 (m, 14H, Aromatic).

12

2,7- (4-) -9,9' - - - (M - 12)

2,7- [4 - (())] -9,9' - - - 5 (5.2) 4
 3.9
 (91.5%) 60 - 61 . ¹H - NMR (CDCl₃) 0.60 - 1.31 (m, 40H, CH₂, 6H, CH₃), 1.9
 8 - 2.08 (m, 4H, CCH₂), 3.12 (s, 2H, CH), 7.39 - 7.80 (m, 14H, Aromatic).

13

9- - (M - 13)

가 2 3 100 (0.6)
 1 -78 2.5
 264 (1.32) 30
 가 1 -78
 88.44 (1.26) 30
 가 24
 2-3 가 3
 132 (88%)
 . ¹H - NMR (CDCl₃) 0.6 - 1.41 (m, 8H, CH₂, 3H, CH₃), 2.08 - 2.12 (m, 4H, CCH₂), 4.07 - 4.18 (t, 1H,
 CH), 7.39 - 7.92 (m, 8H, Aromatic).

14

9- - -9' - (2-) (M - 14)
 가 1 3 9- - 100 (0.4) 1,
 4- 400 40 % 3.05 (8
) 27.591 (0.52) 1,4- 20
 12 30-40
 12 3 110 (90.8%)
 .¹H - NMR (CDCl₃) 0.57 - 1.20 (m, 8H, CH₂, CH₃), 1.42 - 1.58(t, 2H, CCH₂), 1.19 - 2.03(t, 2H, CCH₂), 2.35 - 2.44(t, 2H, CH₂CN), 7.32 - 7.73 (m, 8H, Aromatic).

15

2,7- -9- - -9' - (2-) (M - 15)
 가 1 3 9- - -9'
 - (2-) 100 (0.33) 92.03 (0.36) 91.28
 (0.4) 600 30 , , 120 80
 12 20% ,
 3 (1:2)
 30
 140 (76.66%) 118 - 120 .¹H - NMR (CDCl₃) 0.65 - 1.11 (m, 8H, CH₂, 3H, CH₃), 1.55 - 1.66 (t, 2H, CCH₂), 1.97 - 2.05 (t, 2H, CCH₂), 2.39 - 2.47 (t, 2H, CH₂CN), 7.52 - 7.80 (m, 6H, Aromatic).

16

2,7- -9- - -9' - (2-) (M - 16)
 2,7- -9- - -9' - (2-) 50 (0.09) 1
 가 32 (78%) 145 - 147 .¹H - NMR (CDCl₃) 0.7
 4- 1.15 (m, 8H, CH₂, 3H, CH₃), 1.54 - 1.64 (t, 2H, CCH₂), 2.03 - 2.11 (t, 2H, CCH₂), 2.44 - 2.53 (t, 2H, C
 H₂CN), 7.34 - 7.81 (m, 16H, Aromatic).

17

2,7- (4-) -9- - -9' - (2-)
 (M - 17)
 2,7- -9- - -9' - (-2-) 20 (0.043) 2
 19.39 (72%) 172 - 174 .¹H - NMR (CDCl₃) 0.
 63 - 1.02 (m, 8H, CH₂, 3H, CH₃), 1.51 - 1.61 (t, 2H, CCH₂), 1.97 - 2.06 (t, 2H, CCH₂), 2.36 - 2.44 (t, 2H, CH₂CN), 7.44 - 7.73 (m, 14H, Aromatic).

18

2,7- [4- (())] -9- - -9' - (2-)

(M - 18)

2,7- (4-) - 9- - - 9' - (2-) 19 (0.03) 3
 14.9 (74%) 171 - 172 . ¹H - NMR (CD
 Cl₃) 0.31 (s, 2H, SiCH₃) 0.74 - 1.08 (m, 8H, CH₂, 3H, CH₃), 1.58 - 1.64 (t, 2H, CCH₂), 2.08 - 2.15 (t, 2
 H, CCH₂), 2.48 - 2.56 (t, 2H, CH₂CN), 7.42 - 7.83 (m, 14H, Aromatic).

19

2,7- (4-) - 9- - - 9' - (2-)

(M - 19)

2,7- [4 - (())] 9- - - 9' - (2-) 10 (5.2)
 4 가 6.5 (8
 3.9%) 151 - 152 . ¹H - NMR (CDCl₃) 0.71 - 1.11 (m, 8H, CH₂, 3H, CH₃), 1.5
 8 - 1.64 (t, 2H, CCH₂), 2.09 - 2.12 (t, 2H, CCH₂), 2.49 - 2.58 (t, 2H, CH₂CN), 3.18(s, 2H, CH) 7.41 - 7.85
 (m, 14H, Aromatic).

20

2,7- [() - 9- - - 9' - (2-)

(M - 20)

2,7- - 9- - - 9' - (2-) 8 (0.018) 3
 8 (89.6%) 69 - 70 . ¹H - NMR (CDCl₃) 0.
 26 (s, 2H, SiCh^{a3}), 0.40 - 1.01 (m, 8H, CH₂, 3H, CH₃), 1.40 - 1.55 (t, 2H, CCH₂), 1.92 - 2.0 (t, 2H, CCH₂),
 2.33 - 2.40 (t, 2H, CH₂CN), 7.41 - 7.62 (m, 6H, Aromatic).

21

2,7- - 9- - - 9' - (2-) (M - 21)

2,7- [() - 9- - - 9' - (2-) 5 (0.01) 4
 3 (84.7%)
 . 990 - 91 . ¹H - NMR (CDCl₃) 0.56 - 1.15 (m, 8H, CH₂, 3H, CH₃), 1.47 - 1.5
 6 (t, 2H, CCH₂), 1.92 - 2.0 (t, 2H, CCH₂), 2.33 - 2.41 (t, 2H, CH₂CN), 3.17 (s, 2H, CH) 7.46 - 7.66 (m, 6
 H, Aromatic).

22

2,7- (4- - 2,5- -) - 9,9' - - - (M - 22)

가 1 3 2,7 - (2,5 - -) - 9,9' - -
 4 (4.5) 50 - 5
 10 1.52 (9.8)
 25 24 . 20%
 가 - 40 가 . 2
 , 30 3.9
 (82%) 82 - 83 . $^1\text{H-NMR}$ (CDCl_3) 0.70 - 1.98 (m, 48H, CH_2 , CH_3 , CCH_2),
 3.84 - 4.06(m, 8H, OCH_2), 7.18 - 7.62 (m, 10H, Aromatic).

23

2,7 - (4 -) - 9,9' - - - (P - 1)
 가 50 2,7 - (4 -) - 9,9' - - -
 1.0 (1.8) (CuCl) 0.37 (3.7), (N,N,N',N' - tetram
 ethylethylene diamine) 0.65 (5.6) 15
 2.0N 10 가 1.0
 가 . 0.90 . $^1\text{H-NMR}$ (CDCl_3)
 0.7456 - 1.4315 (br, m, CH_2 , CH_3), 2.01 - 2.17 (br, s, CCH_2), 7.42 - 7.778 (br, m, Aromatic).

24

2,7 - (4 -) - 9 - - - 9' (2 -) (P - 2)
 가 50 2,7 - 94 -) - 9 - - - 9' - (2 -
) 1.0 (1.9) 22 0.93 . $^1\text{H-NM}$
 R (CDCl_3) 0.73 - 1.2 (br, m, CH_2 , CH_3), 1.54 - 1.63 (br, s, CCH_2), 2.02 - 2.19 (br, s, CCH_2), 2.46 - 2.57
 (br, s, CH_2CN), 7.41 - 7.85 (br, m, Aromatic).

25

2,7 - (4 -) - 9,9' - - - (P - 3)
 가 50 2,7 - (4 -) - 9,9' - - -
 (1.0 (1.4) 22 0.91 . $^1\text{H-NMR}$ (CDCl_3)
 0.73 - 1.25 (br, m, CH_2 , CH_3), 2.05 - 2.19 (br, s, CCH_2), 7.53 - 7.89 (br, m, Aromatic).

26

2,7 - (4 -) - 9,9' - - - (P - 4)
 가 50 2,7 - (4 -) - 9,9' - - -
 (1.0 (1.4) 22 0.92 . $^1\text{H-NMR}$ (CDCl_3)
 0.64 - 1.29 (br, m, CH_2 , CH_3), 1.97 - 2.06 (br, s, CCH_2), 7.37 - 7.79 (br, m, Aromatic).

27

2,7- (4-) -9,9' - - - 2,7- (4-) -9- - -9' - (2-)
(C - 1)

가 50 2,7- (4-) -9,9' - - -
0.5 (0.71) 2,7- (4-) -9- - -9' - (-2-) 0.35 (0.71)
() 22 0.78 .¹H - NMR (CDCl₃) 0.54 - 1.29 (br, m, CH₃ - CH₂), 1.46 - 1.79 (br, s, CCH₂), 1.91 - 2.25 (br, t, CCH₂), 2.47 - 2.69 (br, s, CH₂CN), 7.45 - 7.88 (br, m, Aromatic).

28

2,7- (4-) -9,9' - - - 2,7- -9,9' -
- - (C - 2)

가 50 2,7- (4-) -9,9' - - -
0.44 (0.82) 2,7- -9,9' - - - 0.3 (0.78) 22 가
40 0.66
. ¹H - NMR (CDCl₃) 0.5 - 1.3 (br, m, CH₃ - CH₂), 1.8 - 2.2 (br, t, CCH₂), 7.3 - 7.8 (br, m, Aromatic).

29

2,7- (4-) -9- - -9' - (2-) 2,7-
-9,9' - - - (C - 3)

가 50 2,7- (4-) -9- - -9' - (2-)
() 0.41 (0.82) 2,7- -9,9' - - - 0.3 (0.78)
22 가 . 40
0.65 . ¹H - NMR (CDCl₃) 0.5 - 1.28 (br, m, CH₃ - CH₂), 1.4 - 1.7 (br, s, CCH₂), 1.8 - 2.2 (br, t, CCH₂), 2.4 - 2.6 (br, s, CH₂CN), 7.4 - 7.8 (br, m, Aromatic).

30

2,7- -9- - -9' - (2-) (P - 5)
가 50 2,7- -9- - -9' - (2-)
0.5 (1.4) 22

가 . 40
0.42 . ¹H - NMR (CDCl₃) 0.5 - 1.2 (br, m, CH₃ - CH₂), 1.39 - 1.68 (br, s, CCH₂), 1.8 - 2.15 (br, s, CCH₂), 2.24 - 2.57 (br, s, CH₂CN), 7.4 - 7.82 (br, m, Aromatic).

31

2,7- (4-) -9,9' - - - 2,7- -9,9' - - - (C - 4)

가 250 2,7- (4-)-9,9'- - - 0.4
 (0.75) 2,7- -9,9'- - - 0.37 (0.75) 50
 35 (0.03) 24 (0.15), ,
 5.7 (0.03) 50
 70 12 . 2.0N 10 가 1
 가 . 40
 0.65 .

32

2,7- (4-)-9,9'- - - 1 (1.5) - - (C-5)
 2,7- (4-)-9,9'- - - 1 (1.5) - - 0.21 (1.6
) 30 DMF (II) 13.5 - - 18.3
 100 24 . 2.0N 10 가
 1 가 . 40
 0.78 .

33

2,7- (4-)-9,9'- - - (P-6)

가 50 2,7- (4-)-9,9'- - - 1
 (1.23) (II) | o 15 (0.123), 0.26 (0.98),
 (Zn)0.24 (0.123) , 2,2'- 0.26 (0.123) 20~30
 가 1- -2- (NMP) 10
 85-90 , 48 가 . 2.0
 N 10 가 1 가 . 40
 0.75 .

34

1 2 19 28 (C-3)
 3 19 (M-19) (Ultraviolet - Visible, UV - vis) (Photoluminescence,
 PL) . (C-3) 0.1 5 가
 0.2 가 100
 (900 - 1200 rpm) . UV
 UV PL . 4 .

EL 가 ITO/ / EL
 UV - Vis PL ITO 100
 EL 5 6 (C-3)

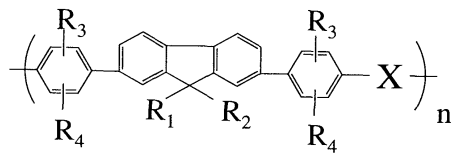
/ 가가

(57)

1.

1 :

1



(, R₁, R₂, R₃ R₄ 가 1~22
 가 6~18 ;

X ;

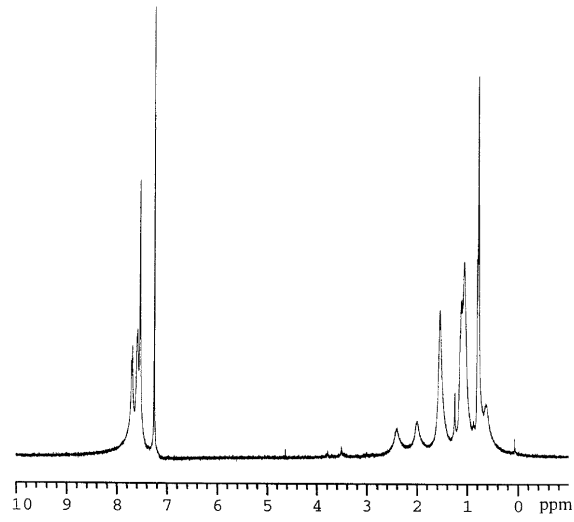
n 1)

2.

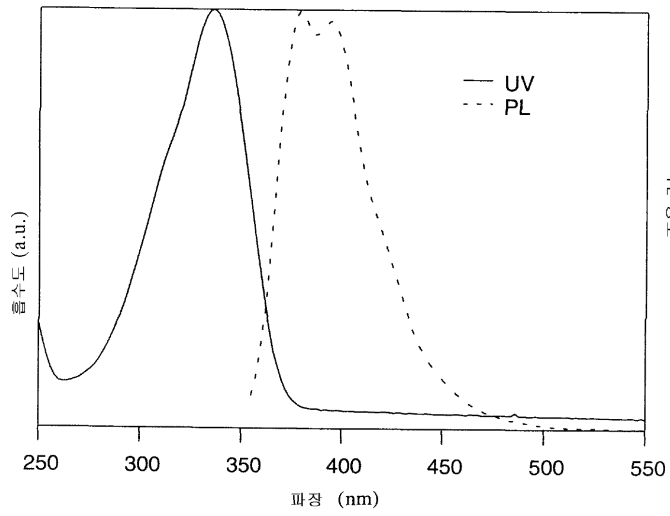
1 , n 1 1000 .

3.

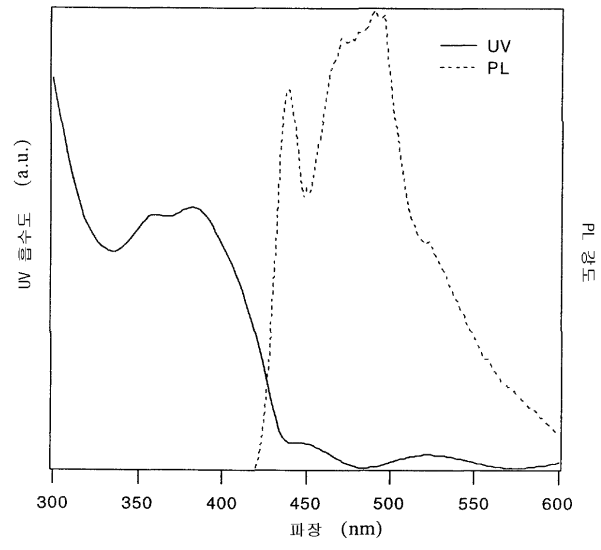
2



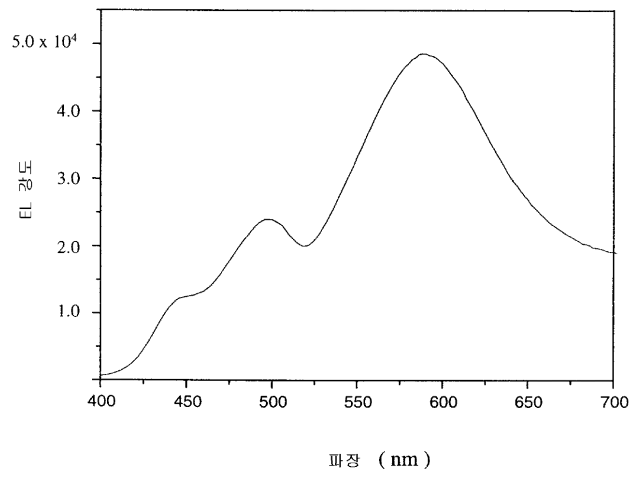
3



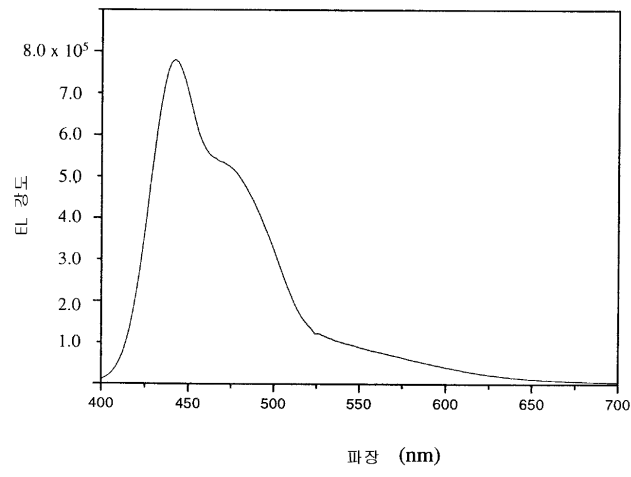
4



5



6



专利名称(译)	基于芴的聚合物和使用其的电致发光器件		
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摘要(译)

提供由下式 (1) 表示的基于芴的聚合物和包含其作为发光材料的电致发光器件。 - 1 - 一级方程式 五 指数方面 芴, 电致发光器件

