

(19)



(11)

EP 2 141 214 A3

(12)

## EUROPEAN PATENT APPLICATION

(88) Date of publication A3:  
24.02.2010 Bulletin 2010/08

(51) Int Cl.:  
C09K 11/06 (2006.01) H01L 51/50 (2006.01)  
H05B 33/14 (2006.01)

(43) Date of publication A2:  
06.01.2010 Bulletin 2010/01

(21) Application number: 09155969.0

(22) Date of filing: 24.03.2009

(84) Designated Contracting States:  
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL  
PT RO SE SI SK TR

Designated Extension States:  
AL BA RS

(30) Priority: 25.06.2008 KR 20080060376

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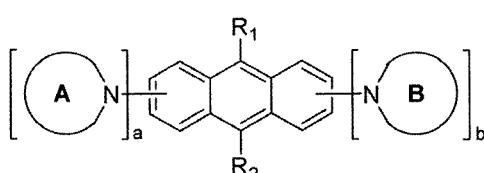
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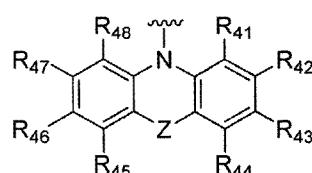
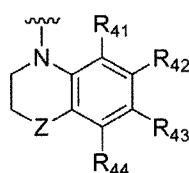
(54) **Novel organic electroluminescent compounds and organic electroluminescent device using the same**

(57) Provided are novel organic electroluminescent compounds **characterized in that** they are represented by Chemical Formula (1):

Chemical Formula 1



wherein, ring A and ring B independently represent a saturated 5- or 6-membered heterocyclic amino group, or a substituent selected from the following structures:



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wherein the saturated 5- or 6-membered heterocyclic amino group may further comprise one or more heteroatom(s) selected from NR<sub>36</sub>, O and S; and a and b independently represent an integer from 0 to 4, provided that (a + b) is an integer from 1 to 4.



## EUROPEAN SEARCH REPORT

Application Number  
EP 09 15 5969

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	US 2008/122344 A1 (SHIN DONG-WOO [KR] ET AL) 29 May 2008 (2008-05-29) * page 4, paragraph [0036], page 5, Formula 10, page 9, paragraph [0054], claims * -----	1-8	INV. C09K11/06 H01L51/50 H05B33/14
X	WO 2007/061181 A (LG CHEMICAL LTD [KR]) 31 May 2007 (2007-05-31) * page 19, compound (3-6), page 20, paragraphs [100] to [103], claims * -----	1-9	
X	WO 2007/102683 A (LG CHEMICAL LTD [KR]) 13 September 2007 (2007-09-13) * page 1, paragraph [4], page 32, Formulae 1-210 to 1-212, page 37, paragraph [108], claims * -----	1-9	
X	JP 2006 248900 A (SONY CORP) 21 September 2006 (2006-09-21) * page 11, compounds 1-8, paragraphs [0050] to [0061], Examples, claims * -----	1-8	
X	JP 2007 015933 A (SONY CORP) 25 January 2007 (2007-01-25) * page 9, compounds 1-10, paragraphs [0052] to [0063], Examples, claims * -----	1-8	C09K H01L H05B
E	EP 2 103 666 A2 (GRACEL DISPLAY INC [KR]) 23 September 2009 (2009-09-23) * page 15, compound 6, page 16, compound 16, page 18, compound 34, page 19, compound 44, claims * -----	1-9	
The present search report has been drawn up for all claims			
3	Place of search Munich	Date of completion of the search 20 January 2010	Examiner Nemes, Csaba A.
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			



## **CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing claims for which payment was due.

Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

## LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

**LACK OF UNITY OF INVENTION  
SHEET B**Application Number  
EP 09 15 5969

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

**1. claims: 1-8**

Organic electroluminescent compound represented by Chemical Formula 2, organic electroluminescent device comprising an organic layer comprising said compound.

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**2. claims: 1-8**

Organic electroluminescent compound represented by Chemical Formula 3, organic electroluminescent device comprising an organic layer comprising said compound.

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**3. claims: 1-8**

Organic electroluminescent compound represented by Chemical Formula 4, organic electroluminescent device comprising an organic layer comprising said compound.

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**4. claims: 1-8**

Organic electroluminescent compound represented by Chemical Formula 5, organic electroluminescent device comprising an organic layer comprising said compound.

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**5. claim: 9**

Organic solar cell comprising an organic electroluminescent compound represented by Chemical Formula 1.

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 15 5969

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

20-01-2010

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专利名称(译)	新型有机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	<a href="#">EP2141214A3</a>	公开(公告)日	2010-02-24
申请号	EP2009155969	申请日	2009-03-24
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 CHI SIK CHO YOUNG JUN KWON HYUCK JOO KIM BONG OK KIM SUNG MIN YOON SEUNG SOO		
发明人	KIM, CHI-SIK CHO, YOUNG JUN KWON, HYUCK JOO KIM, BONG OK KIM, SUNG MIN YOON, SEUNG SOO		
IPC分类号	C09K11/06 H01L51/50 H05B33/14		
CPC分类号	C09K11/06 C07D219/14 C07D223/22 C07D223/24 C09K2211/1011 H01L51/0058 H01L51/5012 H05B33/14 Y02E10/549 Y02P70/521		
优先权	1020080060376 2008-06-25 KR		
其他公开文献	<a href="#">EP2141214A2</a>		
外部链接	<a href="#">Espacenet</a>		

## 摘要(译)

本发明提供新型有机电致发光化合物，其特征在于它们由化学式(1)表示：其中，环A和环B独立地表示饱和的5-或6-元杂环氨基，或选自以下结构的取代基：其中饱和的5-或6-元杂环氨基可进一步包含一个或多个选自NR36，O和S的杂原子；并且a和b独立地表示0至4的整数，条件是(a+b)是1至4的整数。

## Chemical Formula 1

