



(11) **EP 2 100 941 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
06.10.2010 Bulletin 2010/40

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

(43) Date of publication A2:
16.09.2009 Bulletin 2009/38

(21) Application number: **08173052.5**

(22) Date of filing: **30.12.2008**

(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 MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA MK RS

- **Cho, Young Jun**
136-060, Seoul (KR)
- **Kwon, Hyuck Joo**
130-100, Seoul (KR)
- **Kim, Bong Ok**
135-090, Seoul (KR)
- **Kim, Sung Min**
157-886, Seoul (KR)
- **Yoon, Seung Soo**
135-884, Seoul (KR)

(30) Priority: **14.03.2008 KR 20080023831**
29.10.2008 KR 20080106223

(71) Applicant: **Gracel Display Inc.**
Seoul 133-833 (KR)

(74) Representative: **Kent, Venetia Katherine**
Patent Outsourcing Limited
1 King Street
Bakewell
Derbyshire DE 45 1DZ (GB)

(72) Inventors:
• **Lee, Soo Young**
472-120, Gyeonggi-do (KR)
• **Shin, Hyo Nim**
136-060, Seoul (KR)

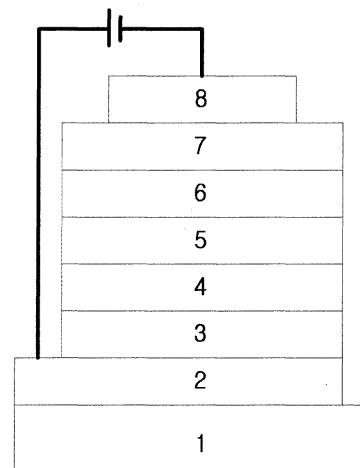
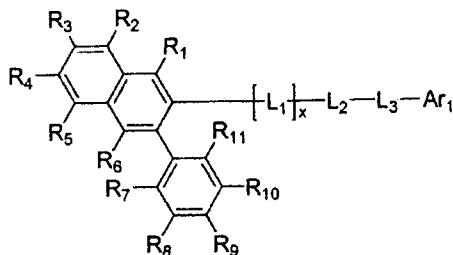
(54) **Novel organic electroluminescent compounds and organic electroluminescent device using the same**

(57) The present invention relates to novel organic electroluminescent compounds, and organic light-emitting diodes and organic solar cells comprising the same. More specifically, the organic electroluminescent compounds according to the present invention are represented by Chemical Formula (1)

cellent color purity and life property as a material, so that an OLED having very good operation life can be prepared therefrom.

Fig. 1

Chemical Formula 1



The organic electroluminescent compounds according to the invention exhibit high luminous efficiency and ex-



EUROPEAN SEARCH REPORT

Application Number
EP 08 17 3052

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	JP 2004 253298 A (KONICA MINOLTA HOLDINGS INC) 9 September 2004 (2004-09-09) * page 148; compounds B1-(II)-104 * -----	1	INV. C09K11/06 H05B33/14
A	EP 1 435 669 A (EASTMAN KODAK CO [US]) 7 July 2004 (2004-07-07) * paragraph [0033]; compounds INV-1 * * claims 1,2,4,6 * -----	1-13	
A	US 2005/280008 A1 (RICKS MICHELE L [US] ET AL) 22 December 2005 (2005-12-22) * paragraph [0172] * * page 14, left-hand column; compound L52 * * claims 1,8,9,30 * -----	1-13	
X	US 2007/141388 A1 (HELBER MARGARET J [US] ET AL) 21 June 2007 (2007-06-21) * compounds H-16, H-7 * * paragraph [0111] * * page 20; compound L45 * -----	1	
X	JP 2007 238500 A (MITSUI CHEMICALS INC) 20 September 2007 (2007-09-20) * page 19; compounds BA(2)(8)-1 * -----	1-13	
X	WO 2007/086695 A1 (LG CHEMICAL LTD [KR]; KIM KONG-KYEOM [KR]; JANG HYE-YOUNG [KR]; LEE JA) 2 August 2007 (2007-08-02) * compounds 16,32, * -----	1-13	
A	WO 2005/042668 A1 (EASTMAN KODAK CO [US]; COSIMBESCU LELIA [US]; VREELAND WILLIAM BERNARD) 12 May 2005 (2005-05-12) * pages 5,18,34 * * page 24 - page 28 * * claims 1,14,26 * -----	1-13	TECHNICAL FIELDS SEARCHED (IPC) C09K H05B C07C
		-/--	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 August 2010	Examiner Ziegler, Jan
CATEGORY OF CITED DOCUMENTS 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		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	

8 EPO FORM 1503 03/02 (P04/C01)



EUROPEAN SEARCH REPORT

Application Number
EP 08 17 3052

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	<p>RAU UWE: "Reciprocity relation between photovoltaic quantum efficiency and electroluminescent emission of solar cells"</p> <p>PHYSICAL REVIEW. B, CONDENSED MATTER AND MATERIALS PHYSICS, AMERICAN INSTITUTE OF PHYSICS, WOODBURY, NY, US LNKD-DOI:10.1103/PHYSREVB.76.085303, vol. 76, 2 August 2007 (2007-08-02), pages 85303-1, XP002525585 ISSN: 1098-0121 * pages 085303-1, left-hand column * * pages 085303-7, right-hand column, paragraph 3 *</p> <p style="text-align: center;">-----</p>	7-13	TECHNICAL FIELDS SEARCHED (IPC)
E	<p>EP 2 075 309 A2 (GRACEL DISPLAY INC [KR]) 1 July 2009 (2009-07-01) * compounds H-176, H-199 * * claims 1,3-5,7-9 * * paragraphs [0001], [0033] - [0044] * * chemical formulas 8, 14, 15 * * compounds H-24 * * compounds H-214 * * compounds H-215 to H-220 * * compounds H-207 *</p> <p style="text-align: center;">-----</p>	1-13	
A	<p>JP 2007 169581 A (TORAY INDUSTRIES) 5 July 2007 (2007-07-05) * paragraph [0041]; compounds 23,30 * * claims 1,5 * * paragraphs [0006], [0041], [0049], [0054] - [0058], [0061], [0107], [0108], [0110] *</p> <p style="text-align: center;">-----</p>	1-13	
A	<p>JP 2006 265515 A (TORAY INDUSTRIES) 5 October 2006 (2006-10-05) * compounds 8,11 *</p> <p style="text-align: center;">-----</p> <p style="text-align: right;">-/--</p>	1-12	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 August 2010	Examiner Ziegler, Jan
CATEGORY OF CITED DOCUMENTS 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		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	

8
EPO FORM 1503 03.02 (P04C01)



EUROPEAN SEARCH REPORT

 Application Number
 EP 08 17 3052

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2007/029798 A1 (TORAY INDUSTRIES [JP]; MURASE SEIICHIRO [JP]; NAGAO KAZUMASA [JP]; SUG) 15 March 2007 (2007-03-15) * compounds 43,47 *	1-12	
A	US 2007/134511 A1 (KAWAMURA HISAYUKI [JP] ET AL) 14 June 2007 (2007-06-14) * page 31 *	1-12	
A	US 2006/210830 A1 (FUNAHASHI MASAKAZU [JP] ET AL) 21 September 2006 (2006-09-21) * page 20; compound P4 *	1-12	
A	WO 2007/032162 A1 (IDEMITSU KOSAN CO [JP]; ITO MITSUNORI [JP]; KUBOTA MINEYUKI [JP]; FUNA) 22 March 2007 (2007-03-22) * paragraph [0023]; compounds H5, H7 *	1-12	
A	US 2006/154107 A1 (KUBOTA MINEYUKI [JP] ET AL) 13 July 2006 (2006-07-13) * page 4; compounds AN-4 *	1-12	
A	US 2007/243411 A1 (TAKASHIMA YORIYUKI [JP] ET AL) 18 October 2007 (2007-10-18) * page 84; compounds 2b-6 * * page 47; compound 2.5 * * page 29; compound 1.51 *	1-12	
A	US 2006/232194 A1 (TUNG YEH-JIUN [US] ET AL) 19 October 2006 (2006-10-19) * page 9 *	1-12	
A	JP 2007 224171 A (TORAY INDUSTRIES) 6 September 2007 (2007-09-06) * compound 19 *	1-12	
	----- -/--		
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 August 2010	Examiner Ziegler, Jan
CATEGORY OF CITED DOCUMENTS 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		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	

8

EPO FORM 1503 03.02 (P04/C01)



EUROPEAN SEARCH REPORT

Application Number
EP 08 17 3052

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 1 604 974 A1 (IDEMITSU KOSAN CO [JP]) 14 December 2005 (2005-12-14) * compounds 57,58 *	1-12	
A	EP 1 852 486 A1 (TORAY INDUSTRIES [JP]) 7 November 2007 (2007-11-07) * compounds 7-9 *	1-13	
A	US 2005/079385 A1 (NOMURA RYOJI [JP] ET AL) 14 April 2005 (2005-04-14) * paragraphs [0014], [0030] *	1-13	
A	WO 2007/145136 A1 (TORAY INDUSTRIES [JP]; NAGAO KAZUMASA [JP]; MURASE SEIICHIRO [JP]) 21 December 2007 (2007-12-21) * compounds 19,24 *	1-13	
A	JP 2002 280182 A (MITSUI CHEMICALS INC) 27 September 2002 (2002-09-27) * paragraph [0039]; compounds c-1 *	1-13	
A	JP 11 012205 A (MITSUI CHEMICALS INC) 19 January 1999 (1999-01-19) * page 32; compounds E-5 *	1-13	
E	EP 2 067 767 A1 (GRACEL DISPLAY INC [KR]) 10 June 2009 (2009-06-10) * page 32; compounds H-139 * * page 24; compounds H-50 *	1-6	
A	WO 2006/130598 A2 (UNIVERSAL DISPLAY CORP [US]; KWONG RAYMOND [US]; ALLEYNE BERT [US]) 7 December 2006 (2006-12-07) * claim 39 *	1-13	
----- -/--			
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 August 2010	Examiner Ziegler, Jan
CATEGORY OF CITED DOCUMENTS 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		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	

8
EPO FORM 1503 03-02 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 08 17 3052

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2006/280965 A1 (KWONG RAYMOND [US] ET AL) 14 December 2006 (2006-12-14) * first compound; paragraph [0098]; compound H2BT * -----	1-13	
A	EP 1 533 290 A1 (IDEMITSU KOSAN CO [JP]) 25 May 2005 (2005-05-25) * page 7; compound CH16 * -----	1-13	
A	JP 2006 052323 A (SONY CORP) 23 February 2006 (2006-02-23) * page 10; compounds 5-13 * -----	1-13	
A	JP 2006 052324 A (SONY CORP) 23 February 2006 (2006-02-23) * page 11; compound 43 * -----	1-13	
A	EP 1 737 277 A1 (IDEMITSU KOSAN CO [JP]) 27 December 2006 (2006-12-27) * page 13; compound B2; B3 * -----	1-13	
A	JP 2006 213725 A (TDK CORP) 17 August 2006 (2006-08-17) * paragraph [0162]; compounds I-17 * -----	1-13	
A	EP 1 405 893 A1 (SANYO ELECTRIC CO [JP]) 7 April 2004 (2004-04-07) * paragraph [0178]; compound C18 * -----	1-13	
A	WO 99/57220 A1 (TDK CORP [JP]; FUJITA TETSUJI [JP]; INOUE TETSUSHI [JP]; AOTANI JUNJI) 11 November 1999 (1999-11-11) * page 63; compounds I-17 * -----	1-13	
A	WO 2007/123256 A1 (CANON KK [JP]; SAITOH AKIHITO [JP]; OKINAKA KEIJI [JP]; IGAWA SATOSHI) 1 November 2007 (2007-11-01) * compound 174 * -----	1-13	
----- -/--			
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 August 2010	Examiner Ziegler, Jan
CATEGORY OF CITED DOCUMENTS 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		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	

8
EPO FORM 1503 03 82 (P04G01)



EUROPEAN SEARCH REPORT

Application Number
EP 08 17 3052

DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)	
A	WO 2007/021117 A1 (GRACEL DISPLAY INC [KR]; HYUN SEUNG-HAK [KR]; LEE JEA-SUNG [KR]; SI SA) 22 February 2007 (2007-02-22) * page 24; compound 37 *	1-13		
A	JP 2000 178548 A (TOPPAN PRINTING CO LTD) 27 June 2000 (2000-06-27) * paragraph [0022] *	1-13		
A	US 2007/087223 A1 (SAKAMOTO YUKINARI [JP] ET AL) 19 April 2007 (2007-04-19) * example 16 * * paragraphs [0101], [0127] * * compound 2m *	1-13		
A	US 2007/059556 A1 (KIM KONG K [KR] ET AL) 15 March 2007 (2007-03-15) * page 4; compounds 1-3 *	1-13		
A	WO 2007/123254 A1 (CANON KK [JP]; SAITOH AKIHITO [JP]; OKINAKA KEIJI [JP]; IGAWA SATOSHI) 1 November 2007 (2007-11-01) * compound A26 *	1-13		TECHNICAL FIELDS SEARCHED (IPC)
A	JP 2001 250688 A (MITSUI CHEMICALS INC) 14 September 2001 (2001-09-14) * compounds C-39 *	1-13		
A	US 2007/270595 A1 (KIM MYEONG-SUK [KR] ET AL) 22 November 2007 (2007-11-22) * compound 28 *	1-13		
A	DE 197 44 792 A1 (HOECHST AG [DE]) 15 April 1999 (1999-04-15) * page 7; compound IVf *	1-13		
----- -/-- -----				
The present search report has been drawn up for all claims				
Place of search The Hague		Date of completion of the search 26 August 2010	Examiner Ziegler, Jan	
CATEGORY OF CITED DOCUMENTS 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		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		

8
EPO FORM 1503 03.02 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 08 17 3052

DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)	
A	US 2003/178607 A1 (SWAGER TIMOTHY M [US] ET AL) 25 September 2003 (2003-09-25) * page 10; compound Polymer D *	1-13		
A,D	US 2004/076852 A1 (CHENG CHIEN-HONG [TW] ET AL) 22 April 2004 (2004-04-22) * paragraph [0065] *	1-13		
A	US 2004/048099 A1 (CHEN JIAN PING [US] ET AL) 11 March 2004 (2004-03-11) * page 39 *	1-13		
A	JP 2002 222697 A (TORAY INDUSTRIES) 9 August 2002 (2002-08-09) * paragraph [0035] *	1-13		
A	HART H ET AL: "EXTENDED TRIPTYCENES" TETRAHEDRON, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL LNKD-DOI:10.1016/S0040-4020(01)87581-5, vol. 42, no. 6, 1 January 1986 (1986-01-01), pages 1641-1654, XP001156242 ISSN: 0040-4020 * the whole document *	1-13		TECHNICAL FIELDS SEARCHED (IPC)
X	US 2004/100188 A1 (HOSOKAWA CHISHIO [JP] ET AL) 27 May 2004 (2004-05-27) * compounds E10, E11 *	1-13		
A	JP 2004 043349 A (MITSUI CHEMICALS INC) 12 February 2004 (2004-02-12) * compounds B-30, D15 *	1-13		
A	WO 2007/032161 A1 (IDEMITSU KOSAN CO [JP]; ITO MITSUNORI [JP]; KUBOTA MINEYUKI [JP]; FUNA) 22 March 2007 (2007-03-22) * compounds h-87 *	1-13		
----- -/--				
The present search report has been drawn up for all claims				
Place of search The Hague		Date of completion of the search 26 August 2010	Examiner Ziegler, Jan	
CATEGORY OF CITED DOCUMENTS 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		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		

8
EPO FORM 1503 03.82 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 08 17 3052

DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)	
A	US 2006/159956 A1 (ITO MITSUNORI [JP] ET AL) 20 July 2006 (2006-07-20) * last compound; page 43 * * last compound; page 49 *	1-13		
A	----- JP 2004 042485 A (MITSUI CHEMICALS INC) 12 February 2004 (2004-02-12) * compounds E-7 *	1-13		
A	----- WO 2007/046658 A1 (LG CHEMICAL LTD [KR]) 26 April 2007 (2007-04-26) * paragraph [0260] * * paragraph [0291] *	1-13		
A	----- WO 2007/072742 A1 (CANON KK [JP]; IGAWA SATOSHI [JP]; OKADA SHINJIRO [JP]; TAKIGUCHI TAKA) 28 June 2007 (2007-06-28) * compounds A-40 *	1-13		
A	----- JP 2007 123863 A (CHISSO CORP) 17 May 2007 (2007-05-17) * second row, last compound; page 40 *	1-13		TECHNICAL FIELDS SEARCHED (IPC)
A	----- WO 2007/061218 A1 (GRACEL DISPLAY INC [KR]; KWON HYUCK-JOO [KR]; CHO YOUNG-JUN [KR]; YOON) 31 May 2007 (2007-05-31) * page 53, line 15 *	1-13		
A	----- WO 2007/018007 A1 (IDEMITSU KOSAN CO [JP]; HOSOKAWA CHISHIO [JP]; YAMAMOTO HIROSHI [JP];) 15 February 2007 (2007-02-15) * the whole document *	1-13		
		-/--		
The present search report has been drawn up for all claims				
Place of search The Hague		Date of completion of the search 26 August 2010	Examiner Ziegler, Jan	
CATEGORY OF CITED DOCUMENTS 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		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		

8
EPO FORM 1503 03.82 (P04C01)



Europäisches
Patentamt
European
Patent Office
Office européen
des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 08 17 3052

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,P	& US 2008/284322 A1 (HOSOKAWA CHISHIO [JP] ET AL) 20 November 2008 (2008-11-20) * fourth compound from the top; page 7 *	1-13	
A	DE 10 2005 040411 A1 (MERCK PATENT GMBH [DE]) 1 March 2007 (2007-03-01) * page 9; compound 15 *	1-13	
A	ZHAO ET AL: "Effect of substituents on the properties of indolo[3,2-b]carbazole-based hole-transporting materials" ORGANIC ELECTRONICS, ELSEVIER, AMSTERDAM, NL LNKD- DOI:10.1016/J.ORGEL.2007.05.001, vol. 8, no. 6, 23 October 2007 (2007-10-23), pages 673-682, XP022310236 ISSN: 1566-1199 * the whole document *	1-13	
A	US 2007/141389 A1 (COGGAN JENNIFER A [CA] ET AL) 21 June 2007 (2007-06-21) * the whole document *	1-13	TECHNICAL FIELDS SEARCHED (IPC)
A	HADIZAD T ET AL: "A general synthetic route to indenofluorene derivatives as new organic semiconductors" ORGANIC LETTERS, AMERICAN CHEMICAL SOCIETY, US LNKD- DOI:10.1021/OL0476570, vol. 7, no. 5, 1 January 2005 (2005-01-01), pages 795-797, XP002446382 ISSN: 1523-7060 * the whole document *	1-13	
A	US 2004/265626 A1 (SHIBANUMA TETSUO [JP] ET AL) 30 December 2004 (2004-12-30) * compounds 102,115 *	1-13	
-/--			
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		26 August 2010	Ziegler, Jan
CATEGORY OF CITED DOCUMENTS			
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		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	

8

EPO FORM 1503 03.82 (P04C01)



Europäisches
Patentamt
European
Patent Office
Office européen
des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 08 17 3052

DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)	
A	EP 1 783 189 A1 (TORAY INDUSTRIES [JP]) 9 May 2007 (2007-05-09) * page 5; compounds E-12 * -----	1-13		
Y	EP 1 672 961 A1 (MITSUBISHI CHEM CORP [JP]) 21 June 2006 (2006-06-21) * last compound; page 26 * * claims 1,13 * * paragraph [0394]; compounds D-1 * * paragraphs [0154], [0394] * -----	1-13		
Y	JP 2001 143869 A (KONISHIROKU PHOTO IND) 25 May 2001 (2001-05-25) * compounds H-26 * -----	1-13		
A	JP 2005 268199 A (MITSUBISHI CHEM CORP) 29 September 2005 (2005-09-29) * pages 32,35,38 * * pages 41,81,83 * -----	1-13		
A	JP 2005 276801 A (MITSUBISHI CHEM CORP) 6 October 2005 (2005-10-06) * page 32 * -----	1-13		TECHNICAL FIELDS SEARCHED (IPC)
A	WO 2005/042666 A1 (LG CHEMICAL LTD [KR]; BAE JAE-SOON [KR]; KANG MIN-SOO [KR]) 12 May 2005 (2005-05-12) * page 70; compounds 1-28 * * compounds 1-23 * -----	1-13		
A	US 4 237 057 A (KRAUS GEORGE A) 2 December 1980 (1980-12-02) * column 2 * -----	1-13		
A	JP 2000 256350 A (UNIV CHIBA) 19 September 2000 (2000-09-19) * paragraph [0025]; compound 12 * -----	1-13		
-/--				
The present search report has been drawn up for all claims				
Place of search		Date of completion of the search	Examiner	
The Hague		26 August 2010	Ziegler, Jan	
CATEGORY OF CITED DOCUMENTS				
X : particularly relevant if taken alone		T : theory or principle underlying the invention		
Y : particularly relevant if combined with another document of the same category		E : earlier patent document, but published on, or after the filing date		
A : technological background		D : document cited in the application		
O : non-written disclosure		L : document cited for other reasons		
P : intermediate document		& : member of the same patent family, corresponding document		

8
EPO FORM 1503 03.82 (P/4C01)



Europäisches
Patentamt
European
Patent Office
Office européen
des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 08 17 3052

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2007/086552 A1 (CHISSO CORP [JP]; ONO YOHEI [JP]; UCHIDA MANABU [JP]) 2 August 2007 (2007-08-02) * compounds 1-64 *	1-13	

A	EP 1 253 151 A1 (TORAY INDUSTRIES [JP]) 30 October 2002 (2002-10-30) * compound 79 *	1-13	

A	JP 2003 086379 A (TORAY INDUSTRIES) 20 March 2003 (2003-03-20) * paragraph [0052]; compound 24 *	1-13	

A	WO 2007/105884 A1 (LG CHEMICAL LTD [KR]; KIM YEON-HWAN [KR]; LEE DONG-HOON [KR]; JANG HYE) 20 September 2007 (2007-09-20) * page 18; compounds 4-5 *	1-13	

A	WO 03/095445 A1 (LG CHEMICAL LTD [KR]) 20 November 2003 (2003-11-20) * compound 56 *	1-13	

A	JP 2005 259799 A (FUJI PHOTO FILM CO LTD) 22 September 2005 (2005-09-22) * page 8; compound 7 *	1-13	

A	US 2007/205412 A1 (BAE JAE-SOON [KR] ET AL) 6 September 2007 (2007-09-06) * page 61; compounds 1-151 *	1-13	

A	US 2004/131881 A1 (ZHENG SHIYING [US] ET AL) 8 July 2004 (2004-07-08) * paragraph [0115] *	1-13	

A	US 2006/131570 A1 (MENG HONG [US]) 22 June 2006 (2006-06-22) * compound 12 *	1-13	

	-/--		
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 August 2010	Examiner Ziegler, Jan
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			

8

EPO FORM 1503 03 02 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 08 17 3052

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	PETITJEAN ET AL: "Conformational switching of the pyridine-pyrimidine-pyridine scaffold for ion-controlled FRET" INORGANICA CHIMICA ACTA, ELSEVIER BV, NL LNKD- DOI:10.1016/J.ICA.2006.05.041, vol. 360, no. 3, 21 January 2007 (2007-01-21), pages 849-856, XP005855461 ISSN: 0020-1693 * the whole document *	1-13	
A	US 2005/014018 A1 (KLUBEK KEVIN P [US] ET AL) 20 January 2005 (2005-01-20) * table 1; compound V *	1-13	
A	WO 2006/056465 A1 (BASF AG [DE]; GESSNER THOMAS [DE]; SCHMIDT HANS-WERNER [DE]; THELAKKAT) 1 June 2006 (2006-06-01) * example 7 *	1-13	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 August 2010	Examiner Ziegler, Jan
CATEGORY OF CITED DOCUMENTS 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		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	

8
EPO FORM 1503 03.02 (P04C01)



Application Number

EP 08 17 3052

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 08 17 3052

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: 1-13
L1 = phenanthrene

2. claims: 1-13
L1 = pyrene

3. claims: 1-13
L1 = perylene

4. claims: 1-13
L1 = fluoren-derivatives

5. claims: 1-13
L1 = fluoranthen

6. claims: 1-13
L1 = claim 2, second row, compound 3

7. claims: 1-13
L1 = [1,10]phenanthroline

8. claims: 1-13
L1 = triphenylene

9. claims: 1-13
L1 = chrysene

10. claims: 1-13
L1 = tetracene

11. claims: 1-13



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 08 17 3052

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:

- L1 = benzanthracene

12. claims: 1-13
- L1 = benzotriphenylene

13. claims: 1-13
- L1 = claim 2, row 4, third compound

14. claims: 1-13
- L1 = pyridine

15. claims: 1-13
- L1 = furan

16. claims: 1-13
- L1 = pyrrole

17. claims: 1-13
- L1 = thiophane

18. claims: 1-13
- L1 = benzo[g] isoquinoline

19. claims: 1-13
- L1 = claim 2, row 5, second compound

20. claims: 1-13
- L1 = anthracene

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

EP 08 17 3052

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.

26-08-2010

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 2004253298	A	09-09-2004	NONE	
EP 1435669	A	07-07-2004	CN 1534077 A	06-10-2004
			JP 2004214201 A	29-07-2004
			JP 2008187185 A	14-08-2008
			KR 20040062412 A	07-07-2004
			US 2005271899 A1	08-12-2005
			US 2004126617 A1	01-07-2004
US 2005280008	A1	22-12-2005	EP 1756246 A1	28-02-2007
			JP 2008503871 T	07-02-2008
			WO 2006009612 A1	26-01-2006
US 2007141388	A1	21-06-2007	EP 1981949 A1	22-10-2008
			JP 2009520355 T	21-05-2009
			KR 20080085140 A	23-09-2008
			WO 2007075268 A1	05-07-2007
JP 2007238500	A	20-09-2007	NONE	
WO 2007086695	A1	02-08-2007	CN 101374789 A	25-02-2009
			EP 1976814 A1	08-10-2008
			JP 2009524653 T	02-07-2009
			KR 20070078724 A	01-08-2007
			KR 20090014326 A	10-02-2009
WO 2005042668	A1	12-05-2005	EP 1675931 A1	05-07-2006
			JP 2007511067 T	26-04-2007
			KR 20060120040 A	24-11-2006
EP 2075309	A2	01-07-2009	CN 101508649 A	19-08-2009
			JP 2009215281 A	24-09-2009
			KR 20090073925 A	03-07-2009
			US 2010019657 A1	28-01-2010
JP 2007169581	A	05-07-2007	NONE	
JP 2006265515	A	05-10-2006	NONE	
WO 2007029798	A1	15-03-2007	EP 1942171 A1	09-07-2008
			KR 20080055891 A	19-06-2008
			US 2009096356 A1	16-04-2009
US 2007134511	A1	14-06-2007	WO 2006062078 A1	15-06-2006
US 2006210830	A1	21-09-2006	CN 101142169 A	12-03-2008

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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

EP 08 17 3052

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.

26-08-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006210830 A1		EP 1860096 A1	28-11-2007
		JP 4263700 B2	13-05-2009
		JP 2006256979 A	28-09-2006
		WO 2006098080 A1	21-09-2006
		KR 20070110362 A	16-11-2007

WO 2007032162 A1	22-03-2007	CN 101268167 A	17-09-2008
		EP 1932895 A1	18-06-2008
		KR 20080052594 A	11-06-2008

US 2006154107 A1	13-07-2006	CN 1960957 A	09-05-2007
		EP 1749809 A1	07-02-2007
		WO 2005115950 A1	08-12-2005
		KR 20070029717 A	14-03-2007

US 2007243411 A1	18-10-2007	EP 1990844 A1	12-11-2008
		WO 2007100010 A1	07-09-2007
		KR 20080114702 A	31-12-2008

US 2006232194 A1	19-10-2006	WO 2006113106 A1	26-10-2006

JP 2007224171 A	06-09-2007	NONE	

EP 1604974 A1	14-12-2005	CN 1784376 A	07-06-2006
		CN 101343234 A	14-01-2009
		WO 2004083162 A1	30-09-2004
		JP 4267623 B2	27-05-2009
		KR 20050107809 A	15-11-2005
		US 2007009758 A1	11-01-2007

EP 1852486 A1	07-11-2007	CN 101128561 A	20-02-2008
		WO 2006090772 A1	31-08-2006
		KR 20070114723 A	04-12-2007
		US 2009066245 A1	12-03-2009

US 2005079385 A1	14-04-2005	NONE	

WO 2007145136 A1	21-12-2007	EP 2028249 A1	25-02-2009
		KR 20090017475 A	18-02-2009
		US 2010163852 A1	01-07-2010

JP 2002280182 A	27-09-2002	NONE	

JP 11012205 A	19-01-1999	JP 3794819 B2	12-07-2006

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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

EP 08 17 3052

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.

26-08-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2067767 A1	10-06-2009	CN 101575259 A	11-11-2009
EP 2067767 A1		JP 2009185024 A	20-08-2009
		KR 20090058063 A	09-06-2009
		US 2009200926 A1	13-08-2009

WO 2006130598 A2	07-12-2006	CN 101203583 A	18-06-2008
		EP 1888708 A2	20-02-2008
		JP 2008543086 T	27-11-2008
		KR 20080013934 A	13-02-2008

US 2006280965 A1	14-12-2006	NONE	

EP 1533290 A1	25-05-2005	CN 1675149 A	28-09-2005
		WO 2004016575 A1	26-02-2004
		JP 2004075567 A	11-03-2004
		KR 20050038617 A	27-04-2005
		TW 287408 B	21-09-2007
		US 2009009073 A1	08-01-2009
		US 2009009074 A1	08-01-2009
		US 2006134456 A1	22-06-2006

JP 2006052323 A	23-02-2006	NONE	

JP 2006052324 A	23-02-2006	NONE	

EP 1737277 A1	27-12-2006	CN 1943278 A	04-04-2007
		JP 2005302667 A	27-10-2005
		WO 2005101913 A1	27-10-2005
		KR 20070004843 A	09-01-2007
		US 2007202354 A1	30-08-2007

JP 2006213725 A	17-08-2006	NONE	

EP 1405893 A1	07-04-2004	WO 02100977 A1	19-12-2002
		JP 4036682 B2	23-01-2008
		JP 2003055652 A	26-02-2003
		US 2005079381 A1	14-04-2005

WO 9957220 A1	11-11-1999	DE 69935104 T2	25-10-2007
		EP 1000999 A1	17-05-2000
		EP 0999256 A1	10-05-2000
		WO 9957221 A1	11-11-1999
		JP 2010053364 A	11-03-2010
		US 6399223 B1	04-06-2002
		US 6387547 B1	14-05-2002

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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

EP 08 17 3052

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.

26-08-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2007123256 A1	01-11-2007	JP 2007308477 A	29-11-2007
WO 2007123256 A1		US 2009033210 A1	05-02-2009
WO 2007021117 A1	22-02-2007	CN 101243157 A	13-08-2008
		EP 1922382 A1	21-05-2008
		JP 2009504730 T	05-02-2009
		KR 20070021043 A	22-02-2007
		US 2009128010 A1	21-05-2009
JP 2000178548 A	27-06-2000	NONE	
US 2007087223 A1	19-04-2007	JP 4029897 B2	09-01-2008
		JP 2007112729 A	10-05-2007
US 2007059556 A1	15-03-2007	CN 101263212 A	10-09-2008
		EP 1943323 A1	16-07-2008
		JP 2009508352 T	26-02-2009
		WO 2007061181 A1	31-05-2007
		KR 20070118571 A	17-12-2007
WO 2007123254 A1	01-11-2007	JP 2007308476 A	29-11-2007
		KR 20090008367 A	21-01-2009
		US 2009079344 A1	26-03-2009
JP 2001250688 A	14-09-2001	JP 3792096 B2	28-06-2006
US 2007270595 A1	22-11-2007	CN 101077972 A	28-11-2007
		JP 2007314532 A	06-12-2007
		KR 20070112653 A	27-11-2007
DE 19744792 A1	15-04-1999	CN 1274383 A	22-11-2000
		WO 9919419 A1	22-04-1999
		EP 1027399 A1	16-08-2000
		JP 2001520255 T	30-10-2001
		US 6509110 B1	21-01-2003
US 2003178607 A1	25-09-2003	NONE	
US 2004076852 A1	22-04-2004	JP 3848296 B2	22-11-2006
		JP 2004139957 A	13-05-2004
		KR 20040034349 A	28-04-2004
		TW 593624 B	21-06-2004
US 2004048099 A1	11-03-2004	CN 1479561 A	03-03-2004

EPC FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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

EP 08 17 3052

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.

26-08-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		EP 1413617 A1	28-04-2004
		JP 3762398 B2	05-04-2006
		JP 2004095554 A	25-03-2004
US 2004048099 A1		US 2004253479 A1	16-12-2004
JP 2002222697 A	09-08-2002	JP 3899907 B2	28-03-2007
US 2004100188 A1	27-05-2004	NONE	
JP 2004043349 A	12-02-2004	JP 4338367 B2	07-10-2009
WO 2007032161 A1	22-03-2007	CN 101268567 A	17-09-2008
		EP 1926159 A1	28-05-2008
		KR 20080052589 A	11-06-2008
US 2006159956 A1	20-07-2006	CN 1842510 A	04-10-2006
		EP 1780191 A1	02-05-2007
		WO 2005123634 A1	29-12-2005
		KR 20070028284 A	12-03-2007
		US 2008303433 A1	11-12-2008
JP 2004042485 A	12-02-2004	NONE	
WO 2007046658 A1	26-04-2007	CN 101291897 A	22-10-2008
		EP 1937616 A1	02-07-2008
		JP 2009514812 T	09-04-2009
		KR 20070043666 A	25-04-2007
		KR 20080103953 A	28-11-2008
		US 2007108892 A1	17-05-2007
WO 2007072742 A1	28-06-2007	EP 1863751 A1	12-12-2007
		JP 2007332127 A	27-12-2007
		KR 20080081320 A	09-09-2008
		US 2009079331 A1	26-03-2009
JP 2007123863 A	17-05-2007	NONE	
WO 2007061218 A1	31-05-2007	NONE	
WO 2007018007 A1	15-02-2007	CN 101233116 A	30-07-2008
		JP 2007039406 A	15-02-2007
		KR 20080031931 A	11-04-2008
		US 2008284322 A1	20-11-2008
DE 102005040411 A1	01-03-2007	CN 101248156 A	20-08-2008

EPO FORM P0458

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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

EP 08 17 3052

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.

26-08-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		EP 1917323 A1	07-05-2008
		WO 2007022845 A1	01-03-2007
		JP 2009505995 T	12-02-2009
		KR 20080049770 A	04-06-2008
DE 102005040411 A1		US 2008193797 A1	14-08-2008
US 2007141389 A1	21-06-2007	KR 20070067612 A	28-06-2007
US 2004265626 A1	30-12-2004	US 2005073641 A1	07-04-2005
EP 1783189 A1	09-05-2007	CN 101010404 A	01-08-2007
		WO 2006021982 A1	02-03-2006
		US 2007267958 A1	22-11-2007
EP 1672961 A1	21-06-2006	WO 2005022962 A1	10-03-2005
		KR 20060096980 A	13-09-2006
		KR 20100012005 A	03-02-2010
		US 2006186796 A1	24-08-2006
JP 2001143869 A	25-05-2001	JP 3968933 B2	29-08-2007
JP 2005268199 A	29-09-2005	NONE	
JP 2005276801 A	06-10-2005	NONE	
WO 2005042666 A1	12-05-2005	CN 1863890 A	15-11-2006
		EP 1680481 A1	19-07-2006
		JP 2007514650 T	07-06-2007
		KR 20050042734 A	10-05-2005
		TW 278504 B	11-04-2007
		US 2005136287 A1	23-06-2005
US 4237057 A	02-12-1980	NONE	
JP 2000256350 A	19-09-2000	NONE	
WO 2007086552 A1	02-08-2007	NONE	
EP 1253151 A1	30-10-2002	AT 286903 T	15-01-2005
		CN 1390841 A	15-01-2003
		DE 60202548 D1	17-02-2005
		DE 60202548 T2	16-02-2006
		KR 20020082801 A	31-10-2002
		KR 20080064099 A	08-07-2008
		SG 121713 A1	26-05-2006

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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

EP 08 17 3052

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.

26-08-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		TW 565604 B	11-12-2003
		US 2003082406 A1	01-05-2003
JP 2003086379 A	20-03-2003	JP 4061969 B2	19-03-2008
WO 2007105884 A1	20-09-2007	CN 101400643 A	01-04-2009
		EP 1993992 A1	26-11-2008
		JP 2009529526 T	20-08-2009
		KR 20070092667 A	13-09-2007
		US 2009174312 A1	09-07-2009
WO 03095445 A1	20-11-2003	AU 2003230308 A1	11-11-2003
		CN 1556803 A	22-12-2004
		EP 1501821 A1	02-02-2005
		JP 2005531552 T	20-10-2005
		KR 20040028954 A	03-04-2004
		TW 288774 B	21-10-2007
		US 2004067387 A1	08-04-2004
		US 2007037012 A1	15-02-2007
JP 2005259799 A	22-09-2005	NONE	
US 2007205412 A1	06-09-2007	CN 101395105 A	25-03-2009
		EP 1991514 A1	19-11-2008
		JP 2009529035 T	13-08-2009
		WO 2007102683 A1	13-09-2007
		KR 20070091540 A	11-09-2007
US 2004131881 A1	08-07-2004	EP 1578887 A2	28-09-2005
		WO 2004061047 A2	22-07-2004
		US 2005202279 A1	15-09-2005
US 2006131570 A1	22-06-2006	US 2008210933 A1	04-09-2008
US 2005014018 A1	20-01-2005	NONE	
WO 2006056465 A1	01-06-2006	CN 101107725 A	16-01-2008
		DE 102004057086 A1	08-06-2006
		EP 1817806 A1	15-08-2007
		JP 2008521947 T	26-06-2008
		KR 20070086613 A	27-08-2007

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	新型机电致发光化合物和使用其的机电致发光器件		
公开(公告)号	EP2100941A3	公开(公告)日	2010-10-06
申请号	EP2008173052	申请日	2008-12-30
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	LEE SOO YOUNG SHIN HYO NIM CHO YOUNG JUN KWON HYUCK JOO KIM BONG OK KIM SUNG MIN YOON SEUNG SOO		
发明人	LEE, SOO YOUNG SHIN, HYO NIM CHO, YOUNG JUN KWON, HYUCK JOO KIM, BONG OK KIM, SUNG MIN YOON, SEUNG SOO		
IPC分类号	C09K11/06 H05B33/14		
CPC分类号	C07C13/567 C07C13/62 C07C13/72 C07C15/20 C07C15/28 C07C15/30 C07C15/38 C07C25/22 C07C49/784 C07C211/54 C07C211/61 C07C255/50 C07C2603/18 C07C2603/24 C07C2603/26 C07C2603/40 C07C2603/44 C07C2603/48 C07C2603/50 C07C2603/52 C07C2603/94 C07D209/86 C07D213/06 C07D215/04 C07D215/06 C07D217/02 C07D221/08 C07D235/08 C07D239/26 C07D241 /42 C07D241/46 C07D243/38 C07D265/38 C07D277/66 C07D279/36 C07D307/91 C07D333/76 C07D487/04 C07D491/06 C07F7/0807 C07F7/0814 C07F9/65683 C09K11/06 C09K2211/1007 C09K2211/1011 C09K2211/1022 C09K2211/1029 C09K2211/1033 C09K2211/1037 C09K2211/104 C09K2211/1044 H01L51/0058 H01L51/0059 H01L51/0077 H01L51/0081 H01L51/5012 H01L2251/308 H05B33/14 Y02E10/549		
优先权	1020080023831 2008-03-14 KR 1020080106223 2008-10-29 KR		
其他公开文献	EP2100941A2		
外部链接	Espacenet		

摘要(译)

本发明涉及新型机电致发光化合物，以及包含该化合物的有机发光二极管和有机太阳能电池。更具体地，根据本发明的机电致发光化合物由化学式(1)表示。根据本发明的机电致发光化合物显示出高发光效率和优异的色纯度和作为材料的寿命性质，因此具有非常好的OLED可以由此制备操作寿命。

Fig. 1

