

(19)  
(12)

(KR)  
(A)

(51) 。 Int. Cl.<sup>7</sup>  
C09K 11/06

(11)  
(43)

10-2004-0106779  
2004 12 18

(21)

10-2003-0037616

(22)

2003 06 11

(71)

1-23

( )

2가 284-25

(72)

204-5

APT104 405

APT113 1202

APT510 1208

1002 502

1-1

102-B01

5 270-5

145-54

B-301

APT405 1409

8 392-27

102

99

APT101 801

1 65

APT6 304

958

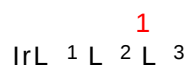
APT106 504

(74)

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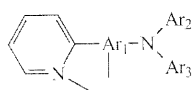
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1



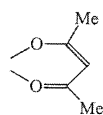
3가,  $\text{L}^1$   $\text{L}^3$  3, 2 3,  $\text{L}^1$   $\text{L}$

2



5,  $\text{Ar}^1$   $\text{Ar}^3$ , , , , N,O S가 1

3



, EL ,

1

1 1 4 ,

2 2 5 ,

3 1 4 (transient photoluminescence)

(electroluminescence device: EL device)

가 가 가

EL (emitting layer) EL EL

가

, 1987 (Eastman Kodak) EL [Appl. Phys. Lett. 51, 913, 1987].

EL 가

num) Alq<sub>3</sub> (tris-8-hydroxyquinolinato aluminum) Alq<sub>3</sub> 가

hosphorescence) (triplet exciton) (p

EL (excitation)

EL S=0 3:1 가 S=

1 가 25%

100% 가

, Forrest Thompson (spin-orbit coupling) PtOEP(H<sub>2</sub>OEP=octaethyl porphyrin)

Alq<sub>3</sub> 3 [V. Cleave, G. Yahioglu, P. L. Barny, R. H. Friend, and N. Tessler, *Advanced Mater.* **1999**, *11*, 285.; R. C. Kwong, S. Sibley, T. Dubovoy, M. Baldo, S. R. Forrest, and M. E. Thompson, *Chem Mater.* **1999**, *11*, 3709.], 130 mA/cm<sup>2</sup>, 13V 264 cd/m<sup>2</sup>

(heavy-atom effect)

[N. E. Tokel, R. E. Hemingway, and A. J. Bard, *J. Am. Chem. Soc.* **1973**, *95*, 6582.; N. E. Tokel and A. J. Bard, *J. Am. Chem. Soc.* **1972**, *94*, 2862.], (III) (II) [M. A. Baldo, M. E. Thompson, and S. R. Forrest, *Nature*, **2000**, *403*, 750.; M. A. Baldo, D. F. O'Brien, M. E. Thompson, and S. R. Forrest, *Phys. Review B*, **1999**, *60*, 14422.; P. E. Burrows, S. R. Forrest, T. X. Zhou, and L. Michalski, *Appl. Phys. Lett.* **2000**, *76*, 2493.; M. Maestri, V. Balzani, C. Deuschel-Cornioley, and A. von Zewelsky, 'Photochemistry and Luminescence of Cyclometallated Complexes,' in *Advances in Photochemistry*, Vol. 17, pp1, Wiley, New York, **1992**.; J. H. van Diemen, R. Hage, H. E. B. Lampers, J. Reedjik, J. G. Vos, L. De Cola, F. Barigelleti, and V. Balzani, *Inorg. Chem.* **1992**, *31*, 3518.; S. Serroni, S. Campagna, G. Denti, A.

Juris, M. Venturi, and V. Balzani, *J. Am. Chem. Soc.* **1994** , 116 , 9086.].

(III)

가

UDC (acac)Ir(btp)<sub>2</sub>  
[S. Lamansky, P. Djurovich, C. Adachi, P. E. Burrows, S. R. Forrest, M. E. Thompson, *J. Am. Chem. Soc.* **2001** , 123 , 4304.; S. Lamansky, P. Djurovich, D. Murphy, R. Kwang, M. E. Thompson, *Inorg. Chem.* **2001** , 40 , 1704] , Firpic[C. Adachi, R. Kwang, P. Djurovich, V. Adamovich, M. A. Baldo, S. R. Forrest, M. E. Thompson, *Appl. Phys. Lett.* **2001** , 79(13) , 2082.] 가

(III)

가

가

가

1

1

IrL<sup>1</sup>L<sup>2</sup>L<sup>3</sup>

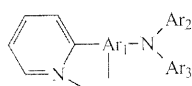
3 가 , L<sup>1</sup> L<sup>3</sup>

3

2 3

L<sup>1</sup> L

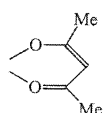
2



5 , Ar<sup>1</sup> Ar<sup>3</sup>

, N,O S가 1

3

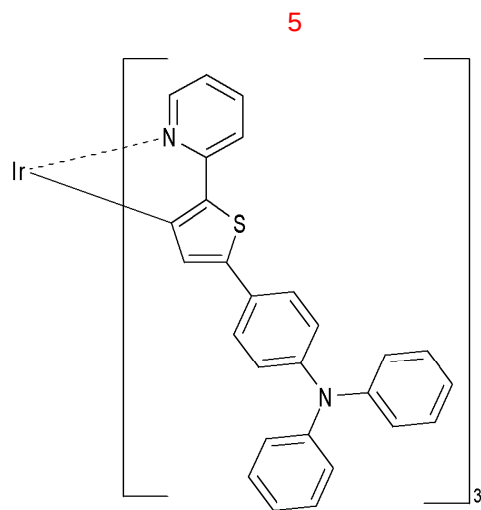
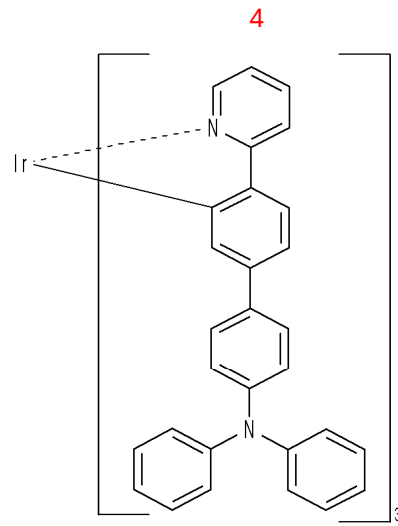


1

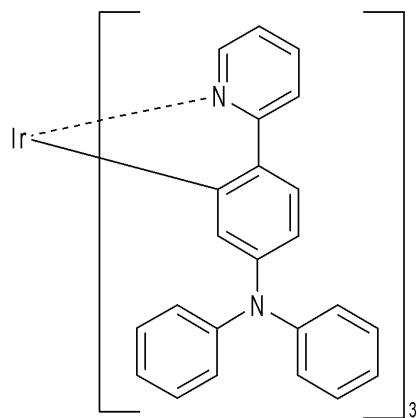
9

1

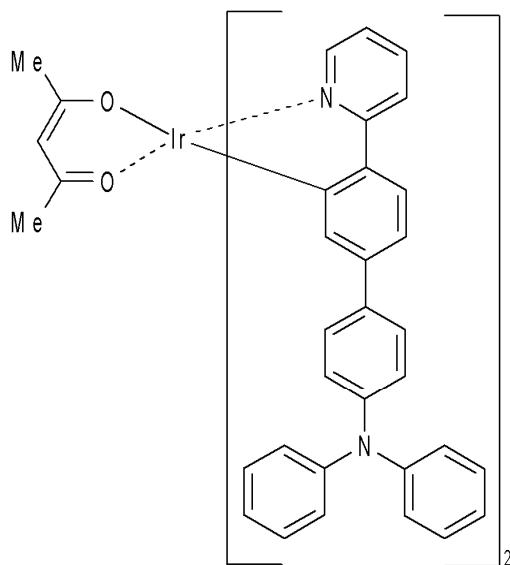
4



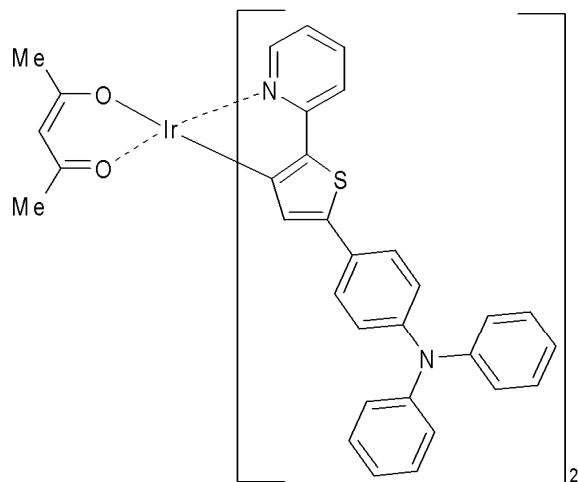
6

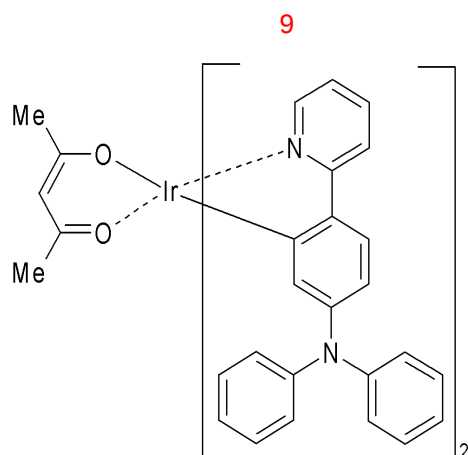


7



8





4 9 (III) , (III) (1) N, O, S  
; (2) 가 , 가 .

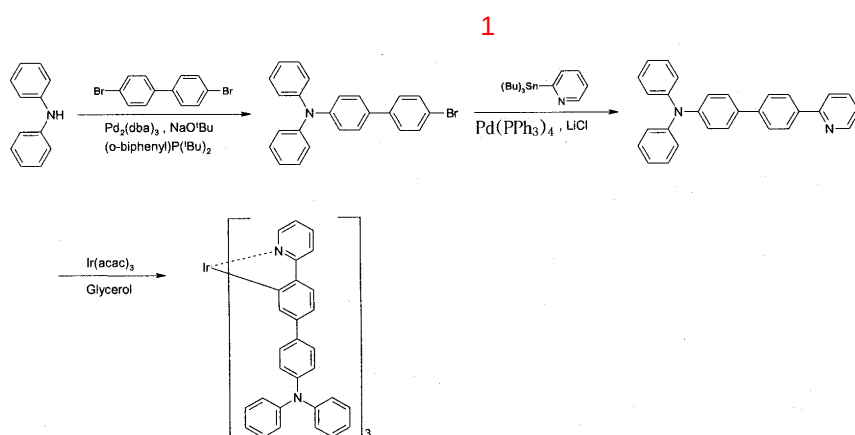
1

1

EL

가

1: 4



(1) 0.20g(1.18mmol) t - 0.14g(NaO<sup>t</sup>Bu, 1.2eq) o - 40Mℓ 가 , 1  
( ( ) (0) 0.011g(Pd<sub>2</sub>(dba)<sub>3</sub>, 0.01eq), ( o - )

$t$  - 7mg(0.02eq), 4,4'- 0.561g(1.5eq), 100 12 (C<sub>6</sub>H<sub>5</sub>)<sub>2</sub>N-(*p*-C<sub>6</sub>H<sub>4</sub>)(*p*-C<sub>6</sub>H<sub>4</sub>)-Br .

(2) , 2- 0.50g(3.16mmol) (THF) 30Mℓ , -60 n-  
2.4Mℓ(1.6M in Hexane, 1.2eq) 가 1 0.876Mℓ(  
Bu<sub>3</sub>SnCl, 1.0eq) (THF) 5Mℓ , 가 .  
12 0 (KF) 40Mℓ  
1 50Mℓ 2- .

(3) ( ) (0) 0.063g(Pd(PPh<sub>3</sub>)<sub>4</sub>, 0.05eq) 0.138 g (3.0 eq) ,  
(1) (C<sub>6</sub>H<sub>5</sub>)<sub>2</sub>N-(*p*-C<sub>6</sub>H<sub>4</sub>)(*p*-C<sub>6</sub>H<sub>4</sub>)-Br 0.434g(1.04 mmol) 20Mℓ  
가 가 100 24 20Mℓ (2) 2-  
0.40g (1.0 eq) 가 (KF) 40Mℓ  
, 4 0.225g( 50%) .

mp. 160 (dec.)

<sup>1</sup>H NMR(200MHz, CDCl<sub>3</sub>): δ 7.03-7.06(t, 2H, ArH), 7.13-7.16(m, 7H, ArH), 7.21-7.24(m, 1H, ArH), 7.26-7.30(t, 6H, ArH), 7.53-7.56(d, 2H, ArH), 7.68-7.56(d, 2H, ArH), 7.76-7.77(m, 2H, ArH), 8.05-8.07(d, 2H, ArH)

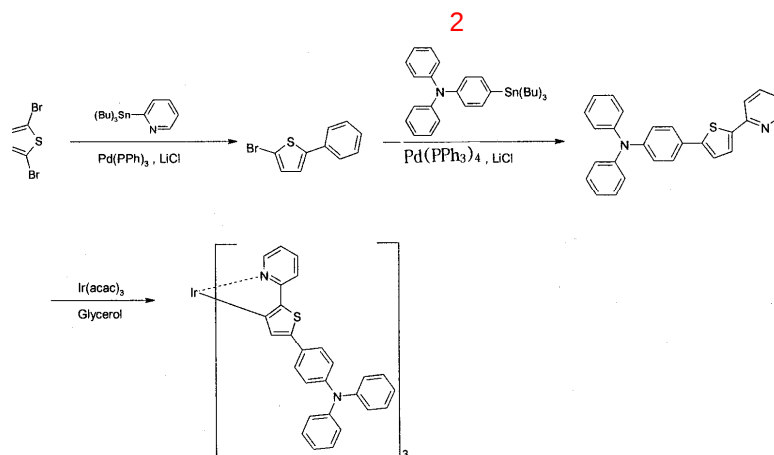
(4) 0.39g(0.98 mmol) (III) 0.10g(0.20mmol) 10Mℓ 가  
200 24 , 1N 50Mℓ 가  
, 0.097g(0.070mmol, 35%) , 4

mp. > 250

<sup>1</sup>H NMR (200MHz, CDCl<sub>3</sub>): δ 6.85-7.89 (m, ArH)

MS/FAB: 1385(found), 1384.5(calculated)

2: 5



(1) ( ) (0) 0.282g(Pd(PPh<sub>3</sub>)<sub>4</sub>, 0.05eq) 0.621g(3.0 eq) , 2,5-  
0.55Mℓ(4.89mmol) 20Mℓ 가 1 (2)  
2- 1.8g(1.0eq) 20Mℓ 가 , 100 24  
, 0 (KF) 40Mℓ ,

-Br

(2) , 4- 0.50g(1.54mmol) (THF) 30Mℓ , -60  
 n- 1.16Mℓ(1.6M in Hexane, 1.2eq) 0.42Mℓ(Bu<sub>3</sub>SnCl, 1.0eq)  
 1 (2) 4-  
 (3) ( ) (0) 0.091g(Pd(PPh<sub>3</sub>)<sub>4</sub>, 0.05eq) 0.20g(3.0eq) , (   
 1) -Br 0.38g(1.6 mmol) 15Mℓ 가 .   
 15Mℓ (2) 4- 1.02g(1.2eq) 가 100  
 24 5 0 (KF) 40Mℓ ,  
 0.355g( 55%)

mp. 120 (dec.)

<sup>1</sup>H NMR(200MHz, CDCl<sub>3</sub>): δ 7.03-7.08(m, 5H, ArH), 7.12-7.14(d, 5H, ArH), 7.24-7.29(m, 5H, ArH), 7.52-7.55(d, 2H, ArH), 7.65-7.69(m, 2H, ArH), 8.57-8.58 (d, 1H, ArH)

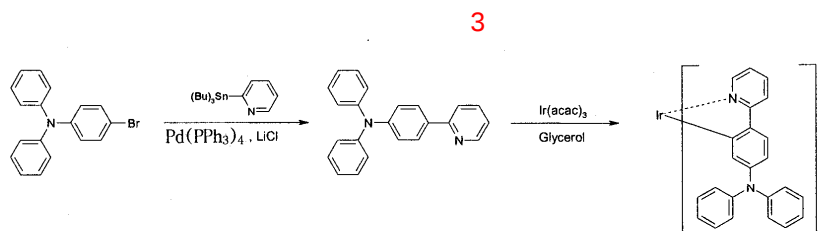
(4) 0.324g(0.80 mmol) 1 (4) (III) 0.1  
 0g(0.20 mmol) 5 0.070g(0.050 mmol, 25%)

mp. &gt; 250

<sup>1</sup>H NMR(200MHz, CDCl<sub>3</sub>): δ 6.71-7.58(m, ArH)

MS/FAB: 1406(found), 1405.8(calculated)

3: 6



(1) ( ) (0) 0.088g(Pd(PPh<sub>3</sub>)<sub>4</sub>, 0.05eq) 0.194g(3.0eq) 4-  
 0.50g(1.54 mmol) 2- 0.562 g (1.0eq) 15Mℓ 가 , 10  
 0 3 4 0 (KF) 40Mℓ  
 0.26g( 51%) 6

mp. 164 (dec.)

<sup>1</sup>H NMR(200MHz, CDCl<sub>3</sub>): δ 7.03-7.28(m, 13H, ArH), 7.66-7.72(m, 2H, ArH), 7.86-7.88(d, 2H, ArH), 8.65-8.66(d, 1H, ArH)

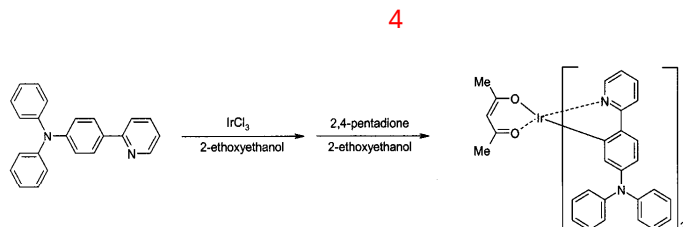
(2) 0.26g(0.81 mmol) 1 (4) (III) 0.10  
 g(0.20mmol) 6 0.081g(0.070mmol, 35%)

mp. &gt; 250

$^1\text{H}$  NMR(200MHz,  $\text{CDCl}_3$ ):  $\delta$  6.48-7.9(m, ArH)

MS/FAB: 1160(found), 1159.4(calculated)

4: 9



(1) (III) 0.20g(0.68mmol) 3 (1) 1.0g(4eq) 2- 9Mℓ  
12  
μ - 0.83g( 70%)  
(2) μ - 0.83g 2,4- 0.123Mℓ (2.6eq), 0.050g 2-  
9Mℓ 4-6  
g( 25%) 6 0.10

mp. > 250

$^1\text{H}$  NMR(200MHz,  $\text{CDCl}_3$ ):  $\delta$  2.1(s, 6H), 5.5-5.6(s, 1H), 6.6-7.8(m, ArH)

MS/FAB: 937(found), 936.14(calculated)

가

UV - vis 300-400nm  
(Photolumine  
scence) 350nm (excitation) 1 2  
2 1 1 4 2  
5  
(Transienst Photoluminescence) 337nm  
546nm, 445nm 3 dppa  
4  
1 2 4 5  
가  
3 4 100ns 가

EL

(57)

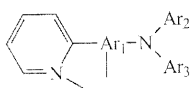
1.

1

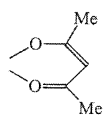
1 $\text{IrL}^1 \text{L}^2 \text{L}^3$ 3 가 ,  $\text{L}^1$   $\text{L}^3$ 

3

2 3

,  $\text{L}^1$   $\text{L}$ 25 ,  $\text{Ar}^1$   $\text{Ar}^3$ 

6

3

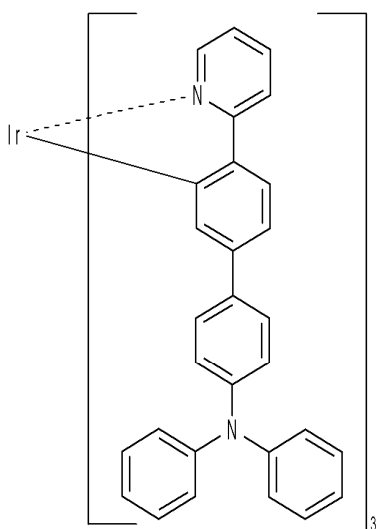
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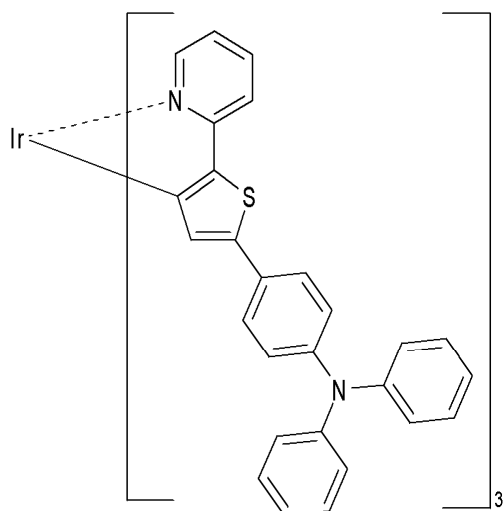
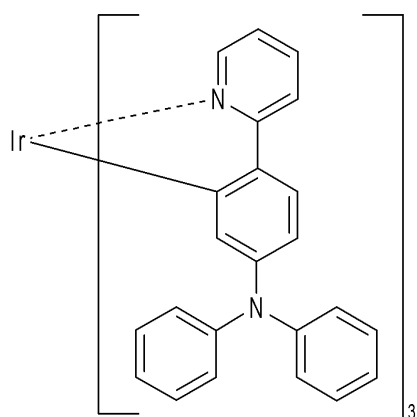
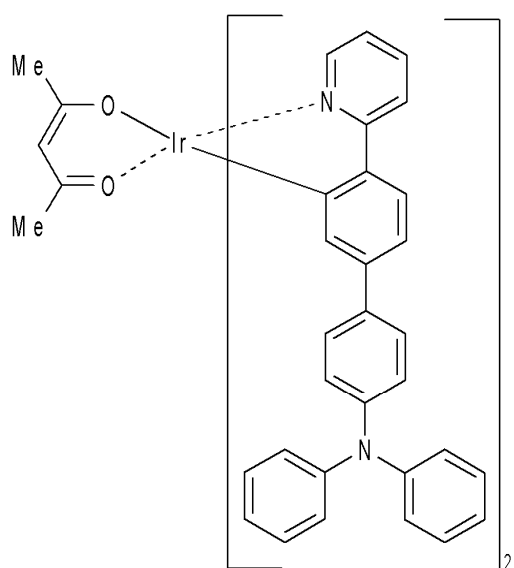
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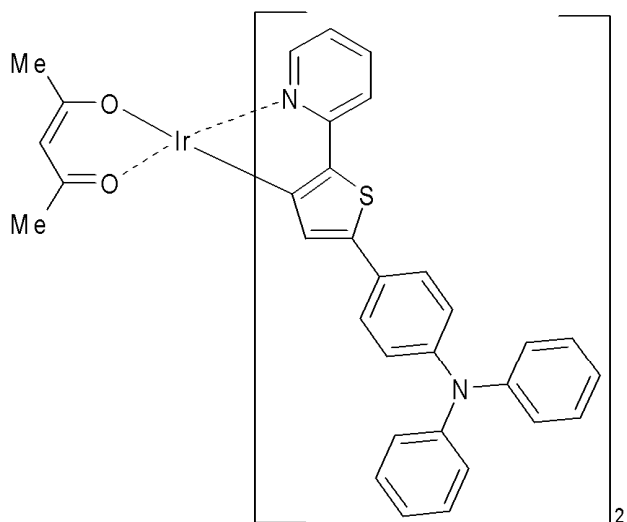
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4

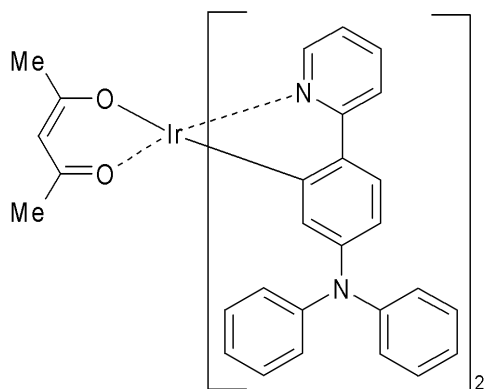
9

4

5678



9



**3.**

1

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1

$\text{IrL}^1 \text{L}^2 \text{L}^3$

3 가 ,  $\text{L}^1$   $\text{L}^3$

3

,

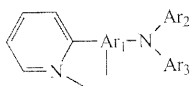
2 3

,

$\text{L}^1$   $\text{L}$

.

2



5 ,  $\text{Ar}^1$   $\text{Ar}^3$

.

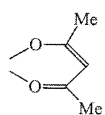
,

,

,

, N,O S가 1

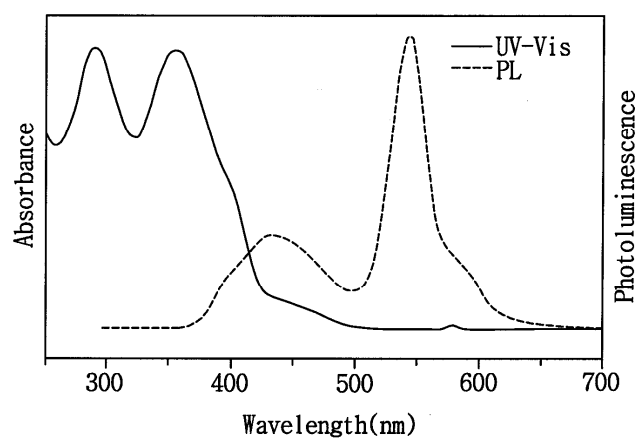
3



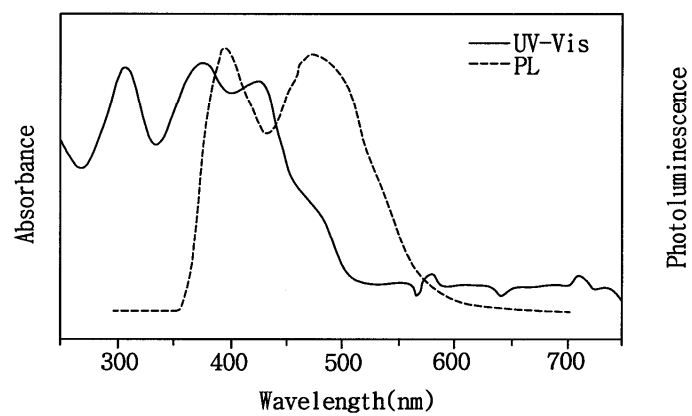
4.

3

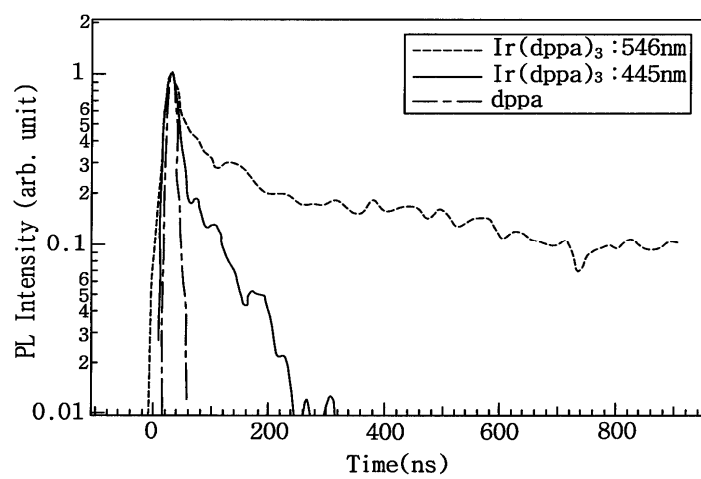
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2



3



|                |                                                                                                                                                                                                                                                                             |         |            |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------------|
| 专利名称(译)        | 电致发光铍化合物和使用它们作为发光掺杂剂的显示元件                                                                                                                                                                                                                                                   |         |            |
| 公开(公告)号        | <a href="#">KR1020040106779A</a>                                                                                                                                                                                                                                            | 公开(公告)日 | 2004-12-18 |
| 申请号            | KR1020030037616                                                                                                                                                                                                                                                             | 申请日     | 2003-06-11 |
| [标]申请(专利权)人(译) | 可隆股份有限公司                                                                                                                                                                                                                                                                    |         |            |
| 申请(专利权)人(译)    | 주식회사코오롱<br>宇预支給显示器材料有限公司                                                                                                                                                                                                                                                    |         |            |
| 当前申请(专利权)人(译)  | 주식회사코오롱<br>宇预支給显示器材料有限公司                                                                                                                                                                                                                                                    |         |            |
| [标]发明人         | KIM KWANHEE<br>김관희<br>PARK JUNGHOO<br>박정호<br>CHO SUNGMIN<br>조성민<br>KIM YOUNCHUL<br>김윤철<br>BAEK SEOGIN<br>백성인<br>NAM EUNJUNG<br>남은정<br>HA YUNKYOUNG<br>하윤경<br>YOON SEUNGSOO<br>윤승수<br>KIM SUNGMIN<br>김성민<br>KIM BONGOK<br>김봉옥<br>KWAK MIYOUNG<br>광미영<br>KIM YOUNGKWAN<br>김영관 |         |            |
| 发明人            | 김관희<br>박정호<br>조성민<br>김윤철<br>백성인<br>남은정<br>하윤경<br>윤승수<br>김성민<br>김봉옥<br>광미영<br>김영관                                                                                                                                                                                            |         |            |
| IPC分类号         | C09K11/06                                                                                                                                                                                                                                                                   |         |            |
| CPC分类号         | A61N2/02 H01F7/06                                                                                                                                                                                                                                                           |         |            |

## 摘要(译)

本发明的目的是提供新的电致发光铱，其表示为下一个化学式1。在IrL 1 L 2 L 3中L 1至L 3的等式是下一个化学式2或由3表示的f是相同的，当L 1至L 3不同时，其余两个L 3的配体仅表示其中一个作为化学式3。在上式中，Ar 1至Ar 3可以是5的杂环，它们是相同的或是另一个，其中苯基，联苯基，萘基，N，O或S是包括1.通过六边形。结果表明，以这种方式得到的新型铱化合物的电荷转移性能得到了很大改善，发光波长的调节变得容易，并且由于不仅辐射波长调谐而改善了元件的寿命在采用这种有机电致发光显示器的情况下，也期望低驱动电压。

