

(19)
(12)

(KR)
(A)

(51) 。 Int. Cl.⁷
C09K 11/06

(11)
(43)

10-2004-0099798
2004 12 02

(21)

10-2003-0031904

(22)

2003 05 20

(71)

가 619-1

(72)

355-2

A 105

가 3661/2

102-1008

5가118

D 205

2

105-104

(74)

:

(54)

,

E L

EL

,

,

2

1

EL

2

4

3

6

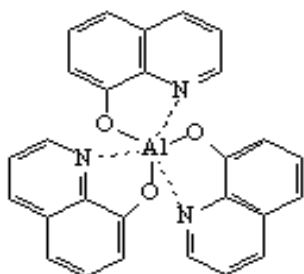
4 4 EL
 5 6 EL

(, EL)
 EL
 ,
 ,가
 ,가

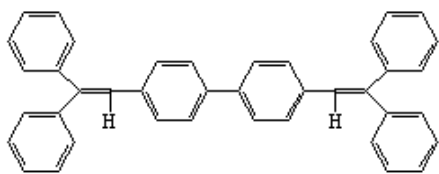
EL i
) (AlQ3; C.W, Tang, Appl. Phys. Lett., 51(12), 1983),
 - 1,1'- (DPVBi) (; 5,130,630),
)-2-t- -6-(1,1,7,7- -9-)4H-
 (DCJTb; ; 5,908,581)

DPVBi EL 480nm
 530nm AIQ3

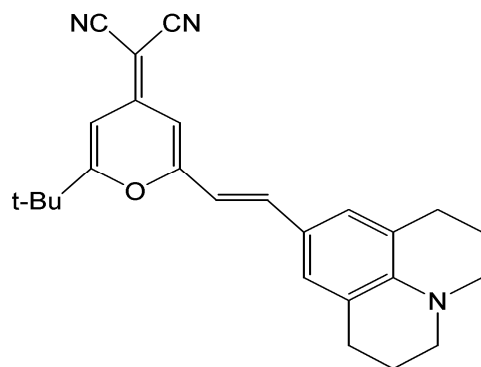
[i]



[ii]



[iii]



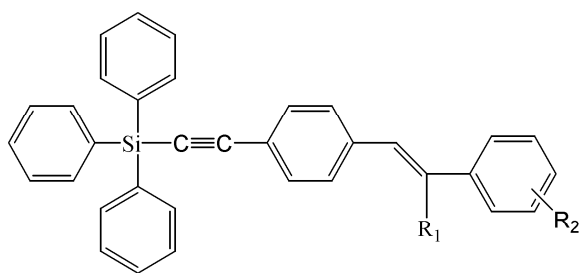
, , 가 EL

EL

EL

1

[1]



, R₁, C1, C12, C6, C18

R₂, C1, C12, C6, C18, N(R₅)(R₆)

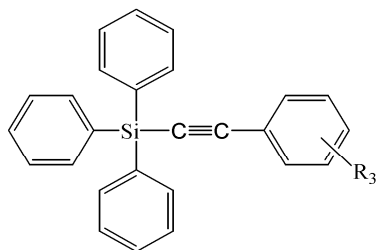
R₅, R₆, C1, C12, C6

R₁, R₂, R₅, R₆가 C1, C6, C1

, , C1 C6 C1 C6 , , , C1 C6 .

2

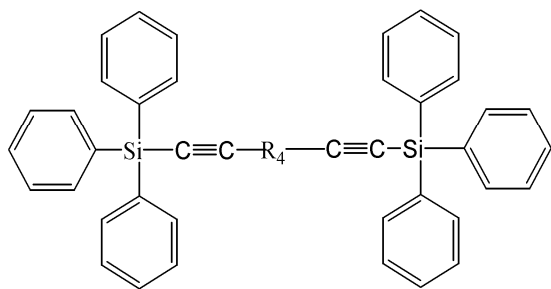
[2]



, R₃ , , C1 C12 , C6 C18 , C1 C12 , N(R₅)(R₆) , R₅ R₆ C1 C12 , C6 C18 R₃, R₅ R₆ 가 C1 C6 , , , C1 C6 , C1 C6 , C1 C6 .

3

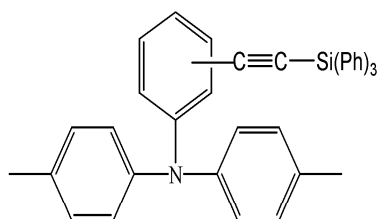
[3]



, R₄ C6 C18

R₄ 가 C1 C6

C1 C6



, C1 C6 , C1 C6

, C1 C6 , C1 C6

EL 1 3 .

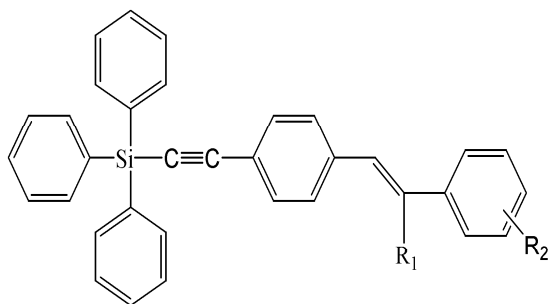
1 3
EL .

EL

1

1

[1]



, R₁

, C1

C12

,

C6

C18

R₁ 1, 2-, 1-, 3-, 2-, 4-, 3-, 9-- , α -, β -, 1-, 9-, 2-, 1-, 9- R

R₂ , C1, C12, C6, C18, N(R₅)(R₆), R₂, R₁

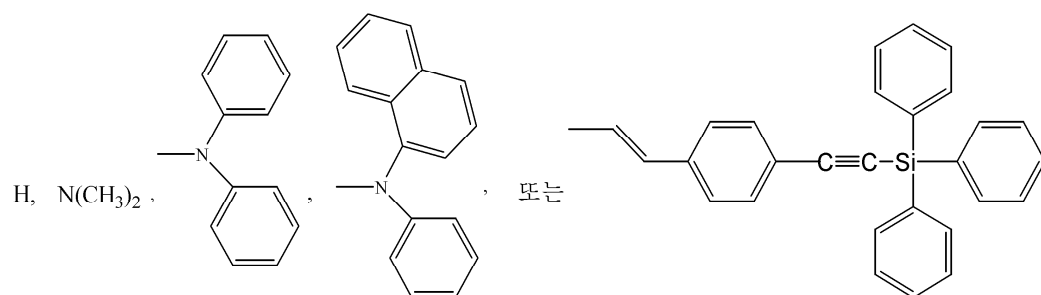
R₂, R₅, R₆, C6, C18, R₅, R₆, C1, C12, R₁

R₁, R₂, R₅, R₆가 C1, C6, C1, C6, C1

1, C1, C6, C1, C6, C1, C6

1

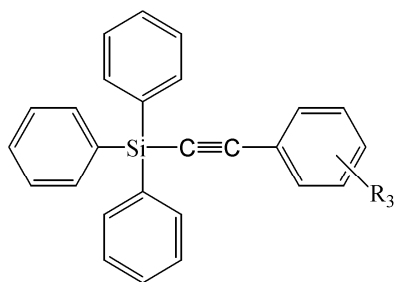
, R₂



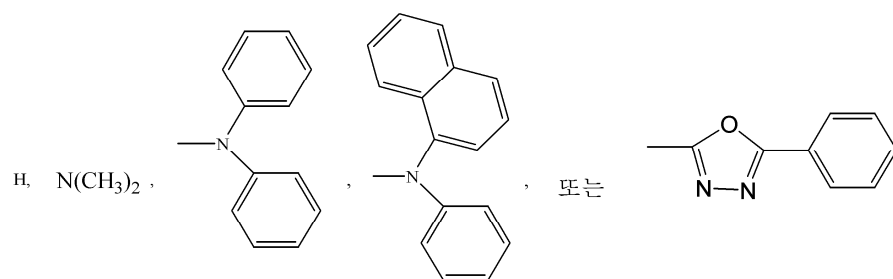
2

2

[2]



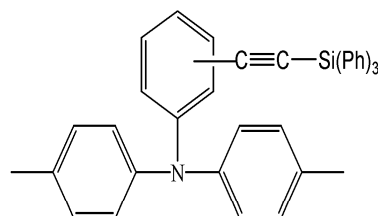
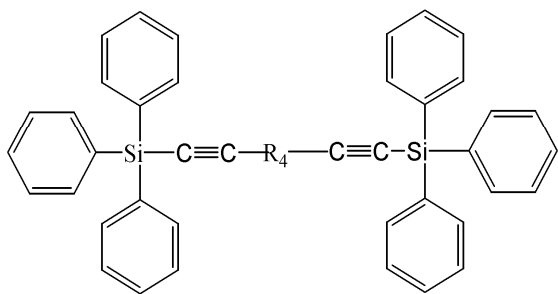
R_3, R_5, R_6 가 C_1, C_6 를 이루는 구조를 나타내며, C_1 과 C_6 는 각각 R_3, R_5, R_6 의 조합으로 형성된 구조를 나타낸다.



3

3

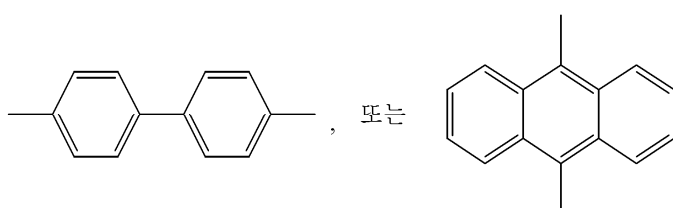
[3]



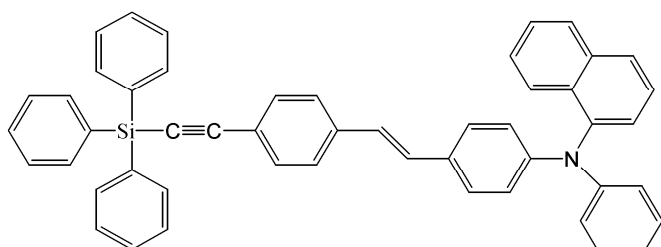
, R₄ C6 C18

$$R_4 \quad \begin{array}{ccccccc} & & 1,4- & , 1,3- & , & 1,2- & ; 1,5- & , 1,6- & , 2,5- \\ , & 2,6- & ; 4,4'- & , 2,2'- & ; & 1,5- & , 2,6- & , 9,10- & ; \end{array}$$

R₄ 가 , , , C1 C6 , C1 C6
C1 C6
, , C1 C6 , C1 C6
, , C1 C6 , C1 C6

$$3, R_4,$$

$$\begin{matrix} & 1 \\ 4 & \end{matrix}$$

[4]



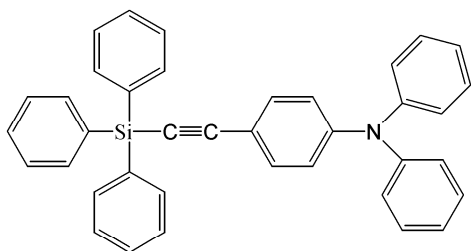
2 12 100nm 4
(Solid PL) 2 , 464nm (PLmax)

4 16 4 EL

4, EL 가 20V 465nm .

2
5 .

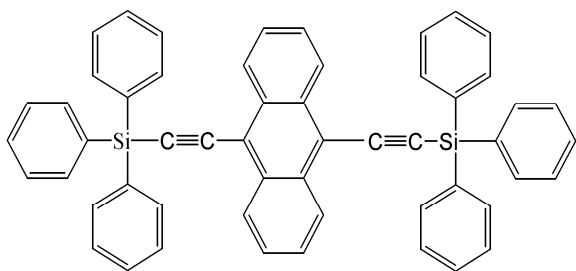
[5]



5 431m (PLmax) . 17
5 437nm EL 가 1
5V .

3
6 .

[6]



3 12 (Solid PL) . 3 100nm 539nm 6 (PLmax)

5 20 6 EL

5, EL 가 20V 560nm .

1 3 EL . , .

EL

가

EL

1

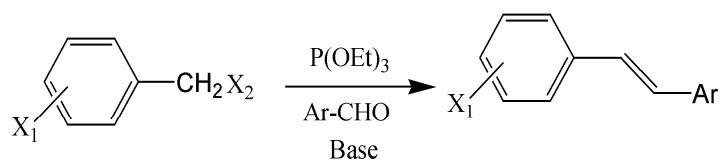
가

1, 1 1 - (wittig-horner)
1, 4-

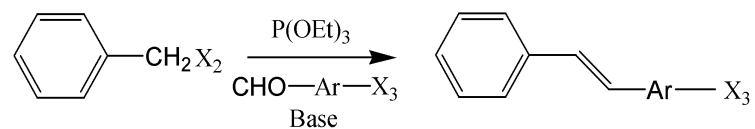
- (wittig-horner)

2

[1]

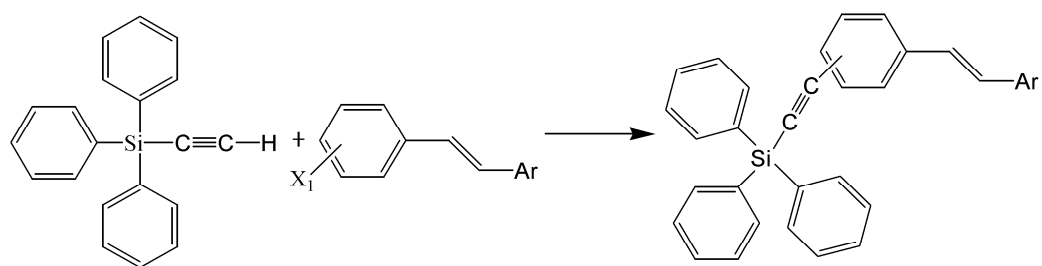


[2]

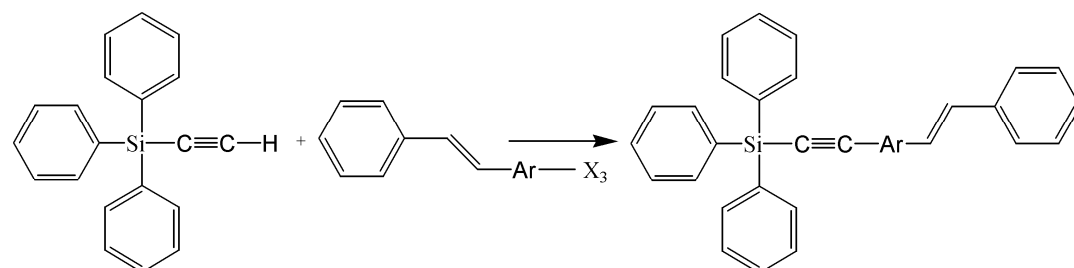


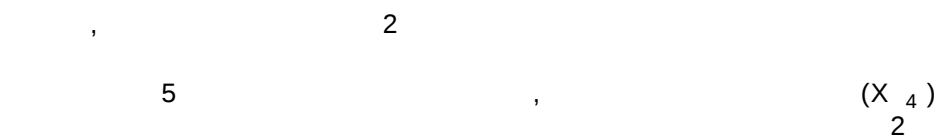
1 2
- THF, 가
10 tert-BuOK, NaH, BuLi 3-
가 , 1 2
1 1 2 , 3 4
가 , , 10-15 , THF ,
1

[3]

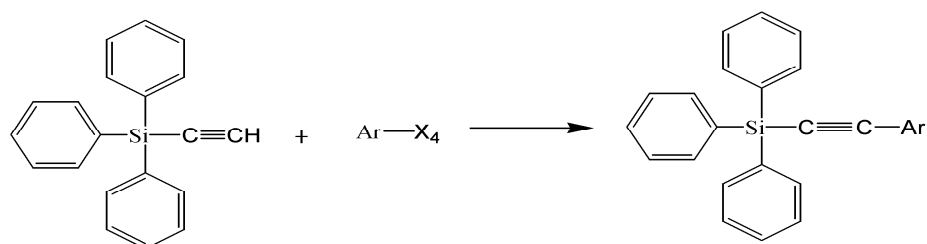


[4]

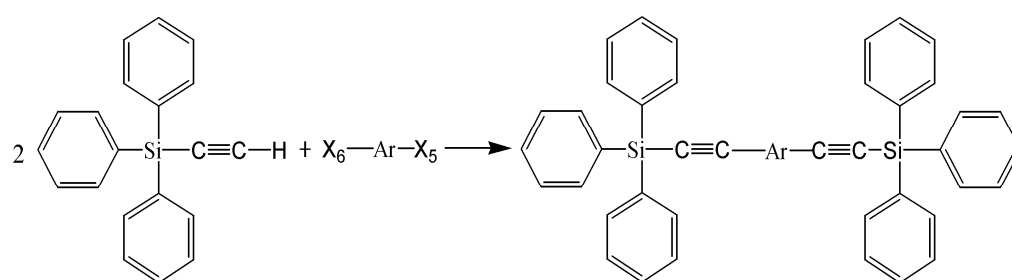




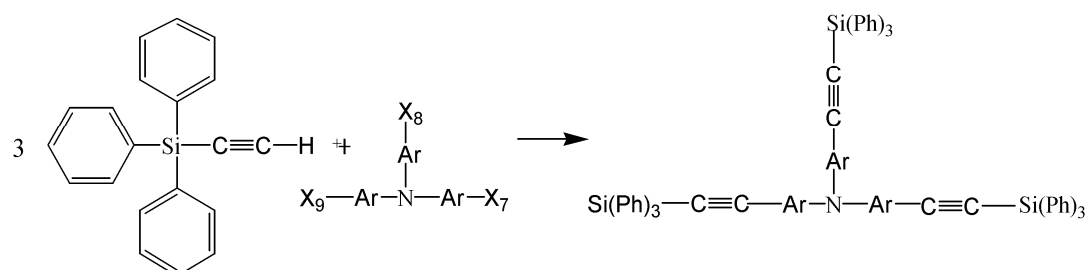
[5]



[6]



[7]



EL (11) (7) (9) (50) (3) (5) (9),

EL (1) (3) (7) (9)

EL (1) (3) (7) (9)

EL (1 1)

EL 4eV
Au CuI, ITO(), SnO₂ ZnO
10-200nm

EL 4eV
, Na, Na-K /AlO₂ / / /
10-200nm

EL 10% 가
 Ω/mm 10nm ~ 1 μm , 10 ~ 400nm
(CVD), (PVD)

EL
, N,N'- -N,N'- (3-)-4,4'- (, TPD), N,N'- -N,N'-
4,4'- , N,N,N'N'- -p- -4,4'-
; (II) 1,10,15,20- -21H,23H-
3 , 1,1- (4- -p-) , N,N,N- (p-) , 4, 4',
4'- [N-(3-)-N-] ; N-
; Advanc
ed materials Vol. 6, page 677(1994) ; Proceedings(II) of the 72th annual sprin
g convention of The Chemical Society of Japan ;

EL , /

EL EL

3,189,447
; J. Appl. Phys., 27, 2
96 (1988) ; Jpn. J. Appl. Phys., 27, L713(1988) Appl. Phys. Lett., 55, 14
89(1989) ; 4-212286
Jpn. J. Appl. Phys., 32, L917(1993) ; The 43th Proceedings of The Society
of Polymer Science, Japan, (III) Pla007 ; Denzhi Jyoho Tsushin Gakkai, 9
2(311), 43(1992) ; Jpn. J. Appl. Phys., 33, L250(19
94) ; The 43th Proceedings of Kobunshi Toronkai, 14J07

1 3 EL

; 1,4- (2-) , 1,4- (4-
) , 1,4- (4- 5- -2-) , 1,4- (5- -2-) , 2,5- (5-t-
-2-) , 1,4- -1,3- , 1,6- -1,3,5- , 1,1,4, 4- -1,3-
63-264692
; 2534713 ; the Proceedings of th
e 40th Joint Lecture of Applied Physics, 1146(1993) ; 7-278537

4-393891

EL

2nm ~ 5000nm

1 3

(pin hole)

1 3

50 ~ 400

가

 $10^{-7} \sim 10^{-4}$ torr

, 0.01 ~ 5nm/sec

, 0 ~ 100

, 10nm ~ 200nm

가

1 3

EL

/

/

/

/

EL

1 μ m

10-200nm ITO

1 3

1 μ m

EL

(+)

(-)

EL

DC

(

1

(1) 1- (4-)

1

1-

-(4-)

100ml

4-

6.24g

4.98g

가

1.91g

THF 50ml

tert-BuOK 4.93g

가

20

1-

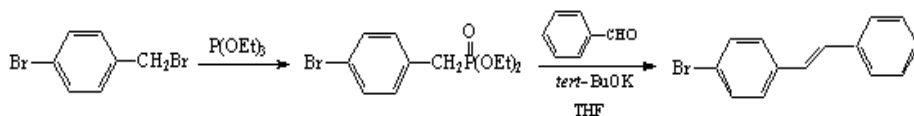
-(4-)

3.17g

(: 6

8 %).

[1]



(2) -4-

2

-4-

100ml

0.512g,

1-

-(4-)

0.388g,

4ml

2.6ml

0

Pd(PPh_3)₂ Cl₂ 35mg, CuI 28.5mg,

63mg

가 60

가

-4-

0.478g

(: 68.9 %).

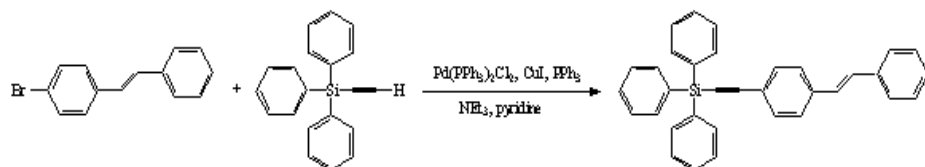
(m.p) 147~151

NMR

NMR- ^1H (400MHz, CDCl_3 ; ppm) : δ = 7.70-7.73(dt, 6H), 7.55-7.57(dd, 2H), 7.46-7.52(m, 4H), 7.37-7.44(m, 9H), 7.34-7.36(dd, 2H), 7.25-7.29(dt, 1H), 7.12-7.16(d, 1H; =CH), 7.05-7.09(d, 1H;).

(PLmax)(CHCl_3) : 379nm (exitation max. : 360nm)

[2]



2

(1) 1- (4-)

4.9g 4g 1 (1) 1- (4-)
(: 66.6%).

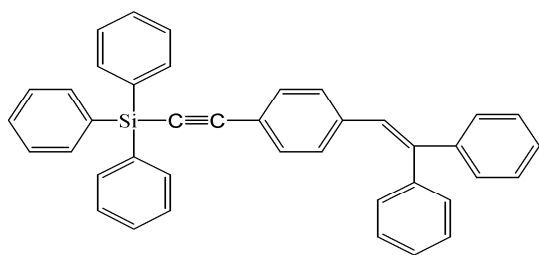
(2) -4-

1- (4-) 1- (4-) 0.502g
1 (2) -4- 0.343
g (: 42.5%).

(m.p) 164~167 NMR .

NMR- ^1H (400MHz, CDCl_3 ; ppm) : δ = 7.59-7.61(dt, 6H), 7.34(m, 1H), 7.27-7.33(m, 9H), 7.23-7.26(m, 8H), 7.21-7.22(d, 1H;), 7.09-7.11(m, 2H), 6.86-6.91(t, 3H).

(PLmax)(CHCl_3) : 402nm (exitation max. : 375nm).



3

(1) 1- (4-)

2.685g 1- (4-) 4.19g (: 77.1 %). 1 (1) NMR .

NMR- ^1H (400MHz, CDCl_3 ; ppm) : δ = 7.36-7.43 (m, 4H), 7.31-7.33(dd, 2H), 6.99-7.03(d, 1H; vinyl), 6.80-6.84(d, 1H;), 6.69-6.71(d, 2H), 2.98(s, 6H; $\text{N}-(\text{CH}_3)_2$).

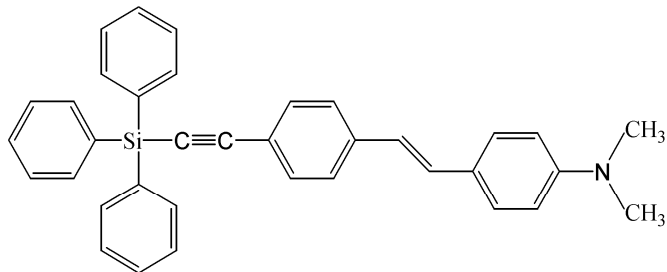
(2) -4-

1- (4-) 1- (4-) 0.452g
1 (2) -4-

0.42g (: 55.4 %). (m.p) 215~218 NMR

NMR- ^1H (400MHz, CDCl_3 ; ppm) : δ = 7.63-7.65 (dt, 6H), 7.44-7.47(dd, 2H), 7.29-7.36(m, 13H), 6.98-7.02(d, 1H;), 6.78-6.82(d, 1H; vinyl), 6.63-6.64(d, 2H), 2.86(s, 6H; N-(CH_3) $_2$).

(PLmax)(CHCl_3) : 466nm (exitation max. : 398nm).



4

(1) 1- (4-)

1- (4-) 3.28g 0.247g (: 67 %). ^1H (1) NMR

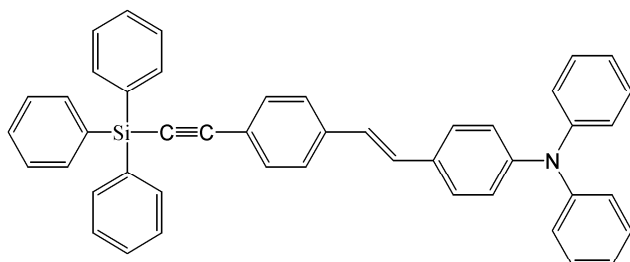
NMR- ^1H (400MHz, CDCl_3 ; ppm) : δ = 7.43-7.47 (dt, 2H), 7.33-7.37(tt, 4H), 7.23-7.28(m, 4H), 7.09-7.12(tt, 4H), 7.01-7.05(m, 5H), 6.88-6.93(d, 1H)

(2) -4-

1- (4-) 1- (4-) 0.425g 0.393g
(: 62.5 %). (2) (m.p) 175~182 -4- NMR

NMR- ^1H (400MHz, CDCl_3 ; ppm) : δ = 7.70-7.73 (dt, 6H), 7.53-7.56(dd, 2H), 7.43-7.45(m, 4H), 7.36-7.42(m, 9H), 7.24-7.26(m, 4H), 7.09-7.12(dt, 4H), 7.03-7.06(dt, 4H), 6.9-6.97(d, 1H).

(PLmax)(CHCl_3) : 470nm (exitation max. : 395nm).



5

(1) 1- (4-(1-))

1- (4-(1-)) 0.7g (: 51.2 %). ^1H (1) NMR

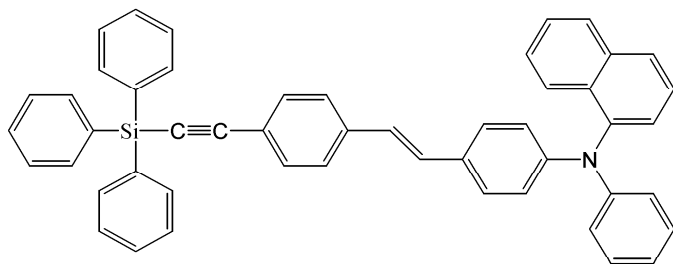
NMR- ^1H (400MHz, CDCl_3 ; ppm) : δ = 7.87-7.92 (t, 2H), 7.77-7.79(d, 2H), 7.42-7.49(m, 4H), 7.30-7.35(m, 6H), 7.19-7.23(m, 2H), 6.98-6.98(m, 4H), 6.84-6.88(d, 1H).

(2) 1- -4-(1-)

1- -(4-) 1- -(4-(1-)) 0.26g
184~186 1 (2) 5 0.177g (: 47.6%).
NMR

NMR- ^1H (400MHz, CDCl_3 ; ppm) : δ = 7.87-7.92 (t, 2H), 7.77-7.79(d, 1H), 7.69-7.72(dt, 6H), 7.38-7.55(m, 5H), 7.37-7.40(m, 9H), 7.32-7.34(m, 5H), 7.19-7.25(m, 2H), 7.07-7.09(m, 2H), 6.89-7.03(m, 5H).

(PLmax)(CHCl_3) : 467nm (exitation max. : 395nm).



6

(1) 1,4- (4-)

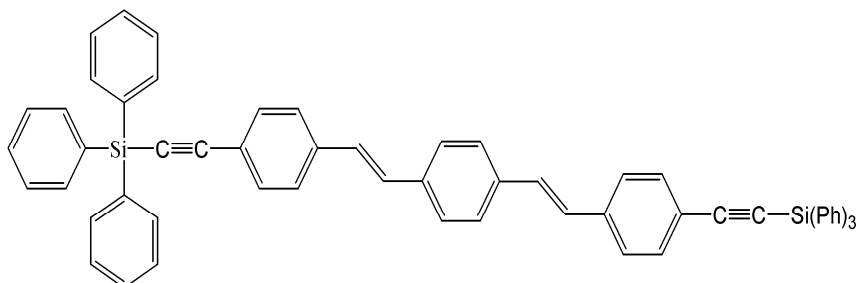
1 (1) 가 100ml
1.48g 4.074g
95g 가 20 ,
1,4- (4-) 1.15g (: 65.38 %).
THF 20ml
tert-BuOK 1.7

(2) 1,4- [(4-)]

1- -(4-) 1,4- (4-) 0.307g
1 (2) 1,4- [(4-)] 0.26g (: 43.92%).
(m.p) 247.6 NMR

NMR- ^1H (400MHz, CDCl_3 ; ppm) : δ = 7.63-7.65 (m, 6H), 7.49-7.5(dd, 2H), 7.42-7.44(m, 4H), 7.40(d, 1H), 7.29-7.37(m, 9H), 7.03-7.05(m, 2H), 6.99-7.00(d, 1H).

(PLmax)(CHCl_3) : 446nm (exitation max. : 346nm).



7

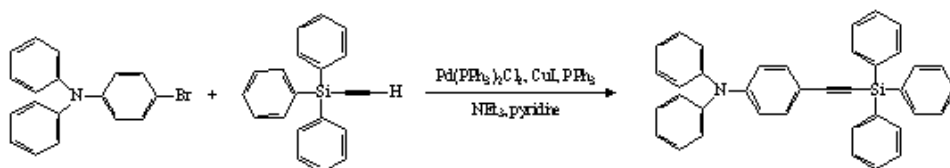
3 4-N,N- -

가 100ml 0.341g, 4- -N,
 N- 0.323g, 4ml 2.6ml 0
 , Pd(PPh₃)₂Cl₂ 21mg, CuI 19mg, 42mg 가 60
 가 0.267g (: 50.66%). 4-N,N-
 MR 210~215 N

NMR- ¹H (400MHz, CDCl₃ ; ppm) : δ = 7.69-7.71 (m, 6H), 7.37-7.43(m, 9H), 7.28-7.36(m, 2H), 7.25-7.27(dt, 4H), 7.08-7.11(dt, 4H), 7.06-7.08(m, 2H), 6.96-6.98(dt, 2H).

(PLmax)(CHCl₃) : 408nm (exitation max. : 367 nm)

[3]



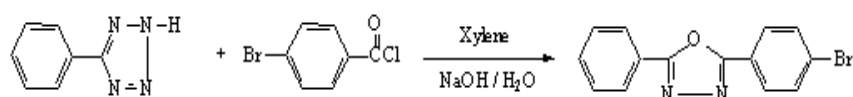
8

(1) 2-[4-]-5- -1,3,4-

4 2-[4-]-5- -1,3,4-

가 100ml 5- -1H- 1.46g 4- -
 2.19g 100ml 140 7
 가 2N 150ml
 2-[4-]-5- -1,3,4- 1.12g (: 37.3 %).

[4]

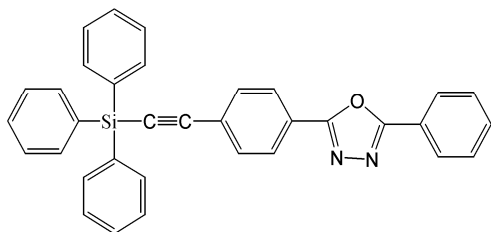


(2)

4- -N,N- 2-[4-]-5- -1,3,4- 0.24g
 7 0.235g (:
 58.31%). (m.p) 173 NMR

NMR- ¹H (400MHz, CDCl₃ ; ppm) : δ = 8.11-8.12 (m, 4H), 7.70-7.73(dt, 6H), 7.74-7.75(m, 2H), 7.54-7.56(m, 3H), 7.39- 7.46(m, 9H).

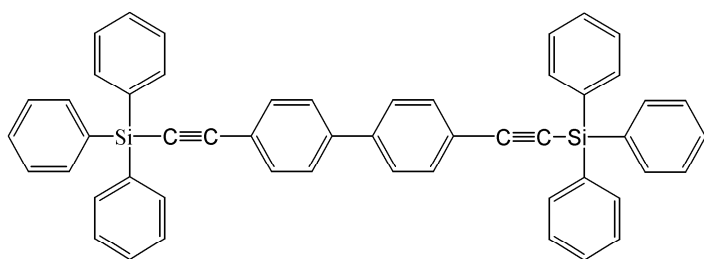
(PLmax)(CHCl₃) : 356nm (exitation max. : 336nm).

9

4- -N,N- 4,4'- 0.218g, 0.478g
 0.487g 7 (: 96.22%). 195~197 4,4' ()
 NMR

NMR- ^1H (400MHz, CDCl_3 ; ppm) : δ = 7.71-7.73 (dt, 12H), 7.65-7.67(dt, 4H), 7.56-7.58(dt, 4H), 7.38-7.45(m, 18H).

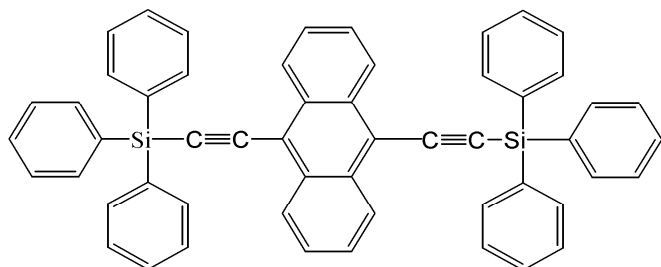
(PLmax)(CHCl_3) : 360nm (exitation max. : 337nm).

10

4- -N,N- 9,10- 0.336g, 0.625g
 0- (7) 0.387g (: 52.08%). 6 9,1
 NMR (m.p) 249~253

NMR- ^1H (400MHz, CDCl_3 ; ppm) : δ = 8.63-8.66(t, 4H), 7.62-7.64(dt, 12H), 7.46-7.58(t, 4H), 7.38-7.44(m, 18H).

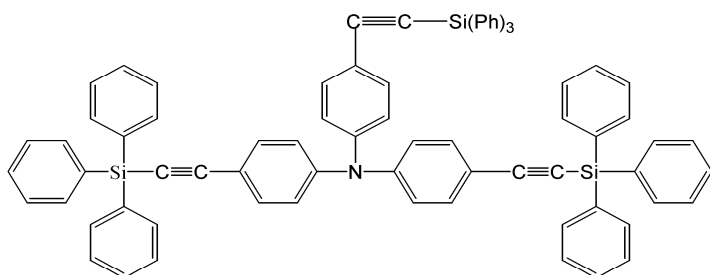
(PLmax)(CHCl_3) : 479nm (exitation max. : 403nm).

11

4- -N,N- (4-) 0.241g, 0.512g
 (: 43.9%). 7 298~301 NMR 0.24g

NMR- ^1H (400MHz, CDCl_3 ; ppm) : δ = 7.69-7.71 (m, 6H), 7.62-7.65(m, 18H), 7.42-7.43(m, 6H), 7.36-7.41(m, 27H).

(PLmax)(CHCl₃) : 398nm(exitation max. : 364nm).



12 : EL

1

1

, EL

, ITO(-) (ITO 150nm, 10Ω/□)

1:1

2 10⁻⁶ torr 0.2~2.0 /sec 60nm
1 2 10⁻⁶ torr 0.2~2.0 /sec 40nm
AlQ₃ 30nm Al
150nm

TPD

EL 가 20V 452nm, 120 cd/m²
(x, y) (0.12, 0.14) . Solid PL 1 100nm
(Varian , : Cary Eclipse) . 445nm .

13

2

12

EL

12

solid PL

EL 가 15V 475nm, 186cd/m²
(x, y) = (0.11 , 0.28) . Solid PL 469nm .

14

3

12

EL

12

solid PL

EL 가 15V 507nm, 220cd/m²
(x, y) = (0.22, 0.46) . Solid PL 499nm .

15

4

12

EL

12

solid PL

EL 가 15V 477nm, 208cd/m²
(x, y) = (0.13, 0.36) . Solid PL 472nm .

16

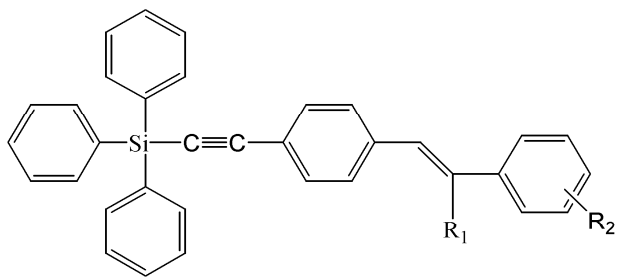
5

12

EL

12

solid PL



, R₁, C1, C12, C6, C18

R₂, C1, C12, C6, C18

N(R₅)(R₆)

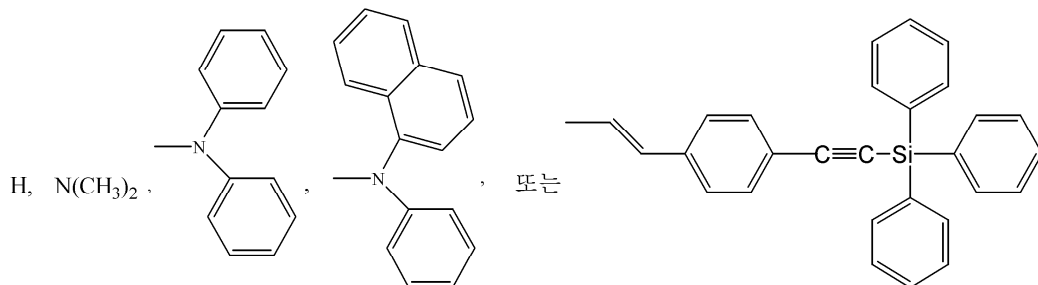
R₅, R₆, C1, C12, C6

R₁, R₂, R₅, R₆가 C1, C6, C1

, C1, C6, C1, C6, C1, C6

2.

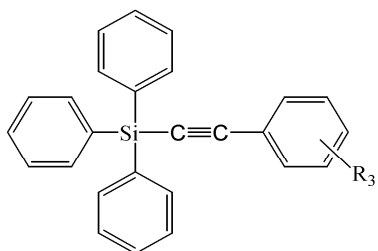
1, R₂



3.

2

[2]

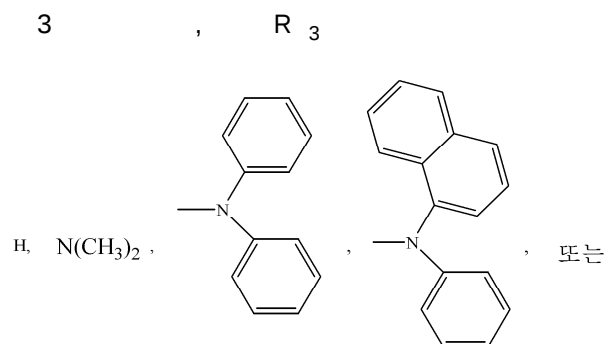


, R₃, C1, C12, C6, C18

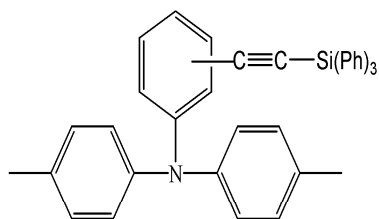
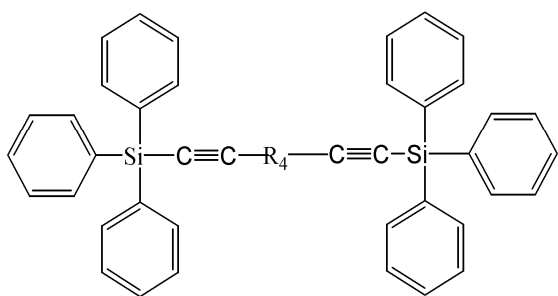
N(R₅)(R₆), C1, C12, C6, C18

C18 R_5 R_6 , C1 C12 , C6
 C6 R_3, R_5 R_6 가 C1 C6 , C1 C6 , C1
 C1 C6 , C1 C6 .

4.

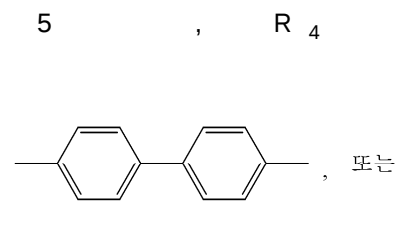


5.



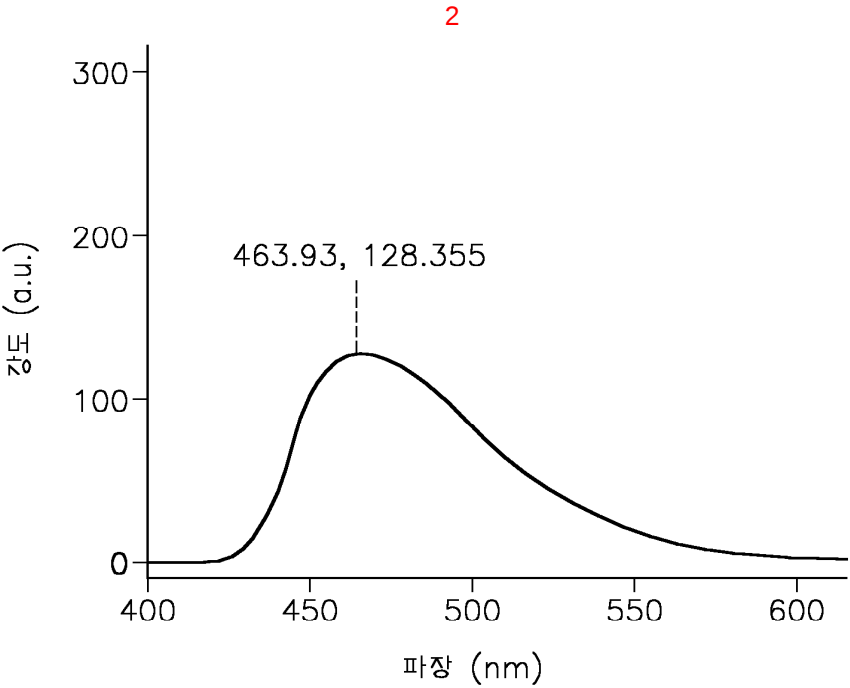
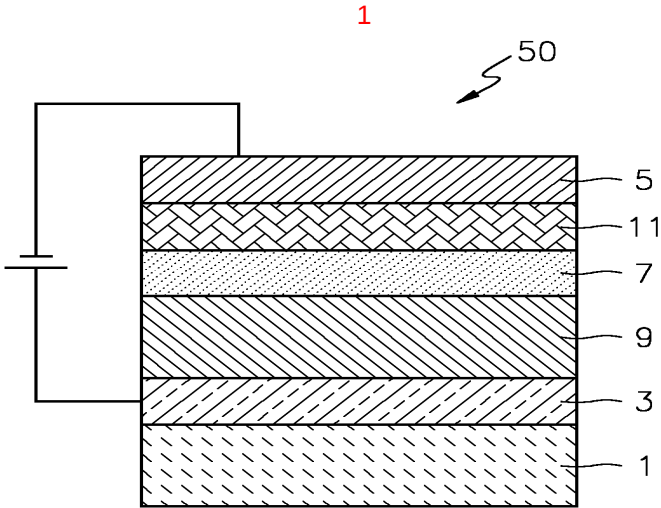
R_4 C6 C18

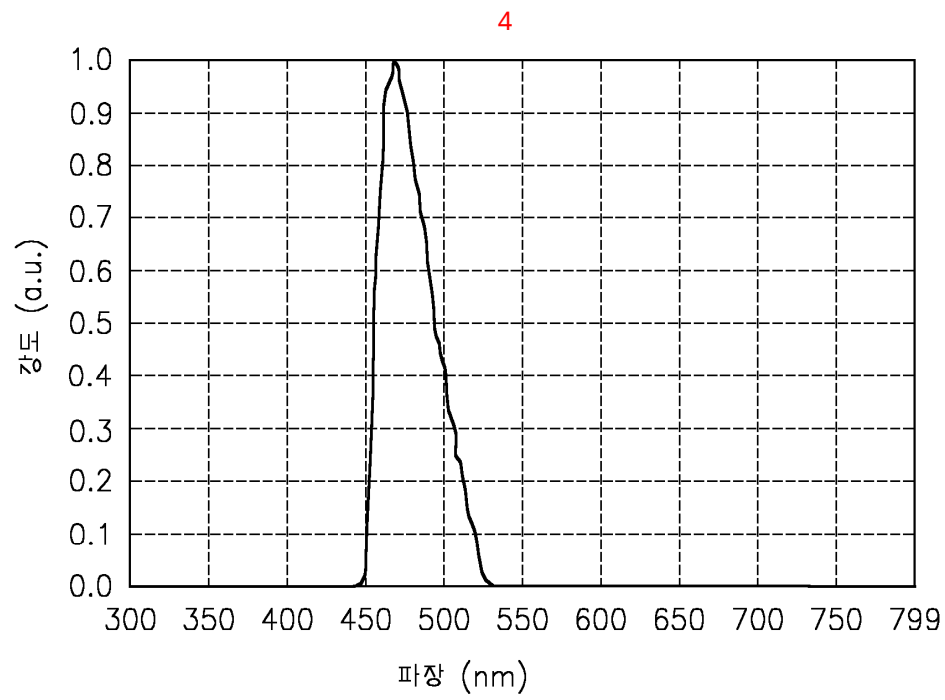
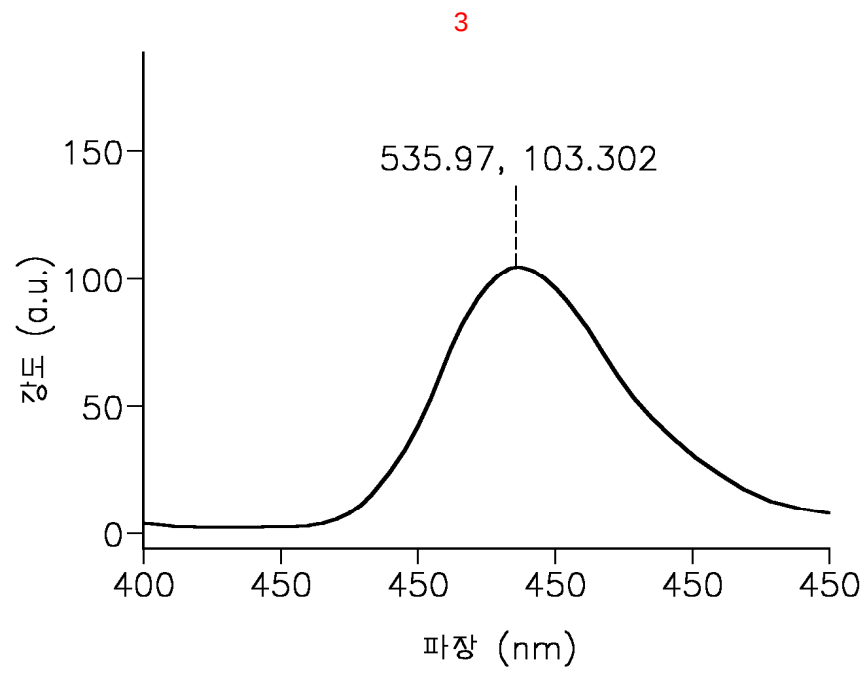
6.

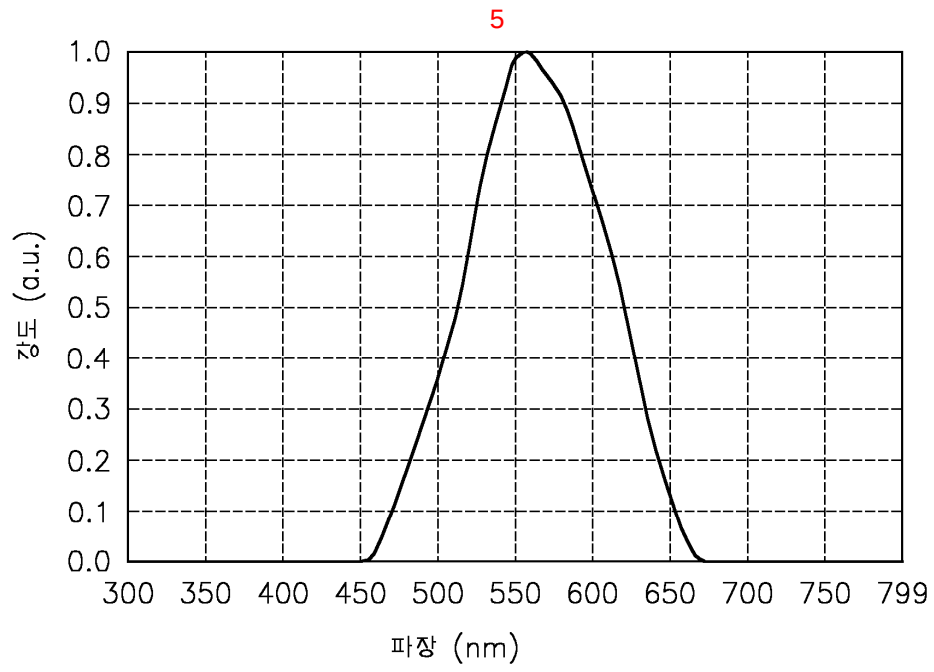


7. 1 6
8. 1 6
EL

EL







专利名称(译)	具有新型三芳基甲硅烷基乙炔基的有机硅烷化合物和使用其的有机EL器件		
公开(公告)号	KR1020040099798A	公开(公告)日	2004-12-02
申请号	KR1020030031904	申请日	2003-05-20
[标]申请(专利权)人(译)	JINWOONG IND		
申请(专利权)人(译)	进雄工业股份有限公司		
当前申请(专利权)人(译)	进雄工业股份有限公司		
[标]发明人	KYUNG SUKHUN 경석헌 HWANG BOSEON 황보선 KANG EUNKYUNG 강은경 LEE JONGRYUN 이종륜		
发明人	경석헌 황보선 강은경 이종륜		
IPC分类号	C09K11/06		
CPC分类号	C07F7/0805 H01L51/0062 H01L51/0094 H01L51/5012 H01L2251/308 H05B33/14 Y10S428/917		
代理人(译)	李, 杨HAE		
其他公开文献	KR100505785B1		
外部链接	Espacenet		

摘要(译)

公开了一种有机电致发光器件，其包含具有三芳基甲硅烷基乙炔基的有机硅烷化合物和使用其形成的发光层。通过使用根据本发明的有机硅烷化合物，可以制备具有全色化和大面积还原所需的色度，亮度和稳定性的有机EL器件。 2

