

(19)
(12)

(KR)
(A)

(51) 。 Int. Cl.⁷
C09K 11/06

(11)
(43)

10-2004-0094842
2004 11 10

(21)	10-2004-7014947		
(22)	2004 09 21		
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JP-P-2002-00081234 2002 03 22
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(JP)
(JP)

(71)

가 가

3 1 1

(72)

299-0205 가 가 1280

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299-0205 가 가 1280

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299-0205 가 가 1280

(74)

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(54)

가

1

가

(EL), 가 ,
EL .

EL 가
EL ,

EL 가 가 , 가 ,
가

(8-)

가 , 가 ,
가 (,
1996-239655 , 1995-138561 , 1991-200289
).

EL 가 ,
EL 가 .

1996-12600

가 , (8-
) (Alq) , , 가

2001-288462

가 ,
2001-160489 가 2 4 cd/A
가 가 ,

EL

가 , EL

가

가 EL 가

1 2

EL

¹
(Cz-)nA

$Cz(-A)^2_m$

,
Cz
A A ,
n m 1 3 .

$(M)_p-(L)_q-(M')^A_r$

[A ,
M M' 2 40
, ,
L 6 30 , 5
30 , 2 30 ,
p 0 2, q 1 2, r 0 2 , p+r 1]
, , EL EL EL EL
, , ,

EL 1 2 .
1
(Cz-)nA
2
Cz(-A)m

,
Cz
n m 1 3 .
6 30 , , , , , ,
, 가 , , , , , , ,

[illegible]

1 2 A A .

A

$$(M)_p - (L)_q - (M')_r$$

, M M'

2 40

•

$\beta -$

L 6 30 , 5
30 , 2 30 .

$$p \leq 0 \leq 2, q \leq 1 \leq 2, r \leq 0 \leq 2 \quad \dots, p+r \leq 1 \leq 2.$$

6 30

' , , , , , , ,

' , , , , , , ,

가 .

[illegible]

5 30 가 , , ,

2 30 , 1- , 2- , 3- , 2- , 3
- , 4- , 1- , 2- , 3- , 4- , 5- , 6- , 7- , 3
 , 1- , 2- , 3- , 4- , 5- , 6- , 7- , 6-
 , 7- , 2- , 3- , 2- , 3- , 4- , 5- , 5-
 , 6- , 7- , 1- , 3- , 4- , 5- , 5-
 , 6- , 7- , 8- , 1- , 3- , 4- , 5- , 5-
 , 6- , 7- , 8- , 1- , 2- , 5- , 6- , 6-
 , 1- , 2- , 3- , 4- , 9- , 1- , 2- ,
3- , 4- , 6- , 7- , 8- , 9- , 9- ,
 , 10- , 1- , 2- , 3- , 4- , 9- , 1,7
- -2- , 1,7- -3- , 1,7- -4- , 1,7- -5- , 1,7- , 1,7
-6- , 1,7- -8- , 1,7- -9- , 1,7- -10- , 1,8- -2- ,
1,8- -3- , 1,8- -4- , 1,8- -5- , 1,8- -6- , 1,8-
 -7- , 1,8- -9- , 1,8- -10- , 1,9- -2- , 1,9- -3-
 , 1,9- -4- , 1,9- -5- , 1,9- -6- , 1,9- -7- , 1,9-
 -8- , 1,9- -10- , 1,10- -2- , 1,10- -3- , 1,10-
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 ,9- -5- , 2,9- -6- , 2,9- -7- , 2,9- -8- , 2,9-
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2,8- -6- , 2,8- -7- , 2,8- -9- , 2,8- -10- , 2,7-
 -1- , 2,7- -3- , 2,7- -4- , 2,7- -5- , 2,7- -6-
 , 2,7- -8- , 2,7- -9- , 2,7- -10- , 1- , 2- , 1-

, 2- , 3- , 4- , 10- , 1- , 2-
 , 3- , 4- , 10- , 2- , 4- , 5- , 2
 - , 5- , 3- , 2- , 3- , 2- , 1- , 2-
 -3- , 2- -4- , 2- -5- , 3- -1- , 3- -2- , 3- -4-
 , 3- -5- , 2-t- -4- , 3-(2-) -1- , 2- -1- , 4- -1-
 , 2- -3- , 4- -3- , 2-t- -1- , 4-t- -1- , 2-t- -3-
 , 4-t- -3- , , 가 .

가

1, 2 A Cz, M M'

가

1 2

$$n \quad m$$

1

[1]

$n = m = 1$	$n = 2$	$n = 3$	$m = 2$	$m = 3$
$Cz - A$	$Cz - A - Cz$	$ \begin{array}{c} Cz - A - Cz \\ \\ Cz \end{array} $	$A - Cz - A$	$ \begin{array}{c} A - Cz - A \\ \\ A \end{array} $

A

p, q, r l

2

[2]

번호	p	q	r	결합 양식
[1]	0	1	1	$L-M'$
[2]	0	1	2	$L-M'-M', M'-L-M'$
[3]	0	2	1	$L-L-M', L-M'-L$
[4]	0	2	2	$L-L-M'-M', M'-L-L-M',$ $L-M'-M'-L, M'-L-M', L-M'-L$ $\begin{array}{ccc} \downarrow & & \downarrow \\ L & & L \end{array} \quad \begin{array}{ccc} \downarrow & & \downarrow \\ L & & L \end{array} \quad \begin{array}{ccc} \downarrow & & \downarrow \\ L & & L \end{array}$
[5]	1	1	0	[1]과 동일함(M'를 M으로 대체함을 제외)
[6]	1	1	1	$M-L-M'$
[7]	1	1	2	$M-L-M'-M',$ $\begin{array}{c} M-L-M' \\ \downarrow \\ M' \end{array}$
[8]	1	2	0	[3]과 동일함(M'를 M으로 대체함을 제외)
[9]	1	2	1	$M-L-L-M', L-M-L-M', M-L-M'-L$
[10]	1	2	2	$M-L-L-M'-M', M'-L-M-L-M',$ $M'-M'-L-M-L,$ $\begin{array}{ccccccc} M-L-L & M-L-L-M' & L-L-M-M' & L-M-L-M' & M-L-L-M' & M-L-L-M' & M-L-L-M' \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ M' & M' & M' & M' & M' & M' & M' \end{array}$
[11]	2	1	0	[2]와 동일함(M'를 M으로 대체함을 제외)
[12]	2	1	1	[7]과 동일함(M'를 M으로, M을 M'로 대체함을 제외)
[13]	2	1	2	$M-M-L-M'-M',$ $\begin{array}{c} M' \\ M-L-M' \\ \downarrow \\ M' \end{array}, \begin{array}{c} M-L-M'-M' \\ \downarrow \\ M \end{array}$
[14]	2	2	0	[4]와 동일함(M'를 M으로 대체함을 제외)
[15]	2	2	1	[10]과 동일함(M'를 M으로, M을 M'로 대체함을 제외)
[16]	2	2	2	$M-M-L-L-M'-M',$ $\begin{array}{c} M-M-L-M'-M' \\ \downarrow \\ L \end{array}, \begin{array}{c} M-L-L-M'-M' \\ \downarrow \\ M \end{array}, \begin{array}{c} M \\ M-L-L \\ \downarrow \\ M' \end{array},$ $\begin{array}{c} M-M-L-L-M' \\ \downarrow \\ M' \end{array}, \begin{array}{c} M \\ L-L-M'-M' \\ \downarrow \\ M \end{array}, \begin{array}{c} M-L-L-M' \\ \downarrow \\ M' \end{array}$

A

Cz A

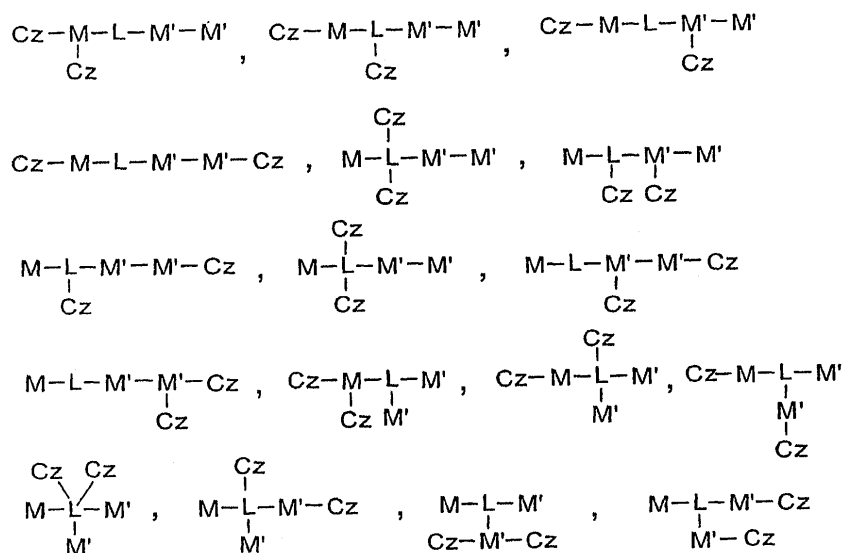
A M, L, M'

, 1 2, m=n=1 Cz-A, (A)가 2[6](p=q=r=1)

Cz-M-L-M', M-L(C

z)-M' M-L-M'-Cz 3

, 1, n=2 Cz-A-Cz, (A)가 2[7](p=q=1, r=2)



1, 2 A
EL 가 ,

1 n=1 , A p=1, r=0 ,

1 Cz가 ,

A M 4 5 6 7 ,

2 4 5 ,

8 11 30 , L

6 30 2 30

EL .

1 n=2 , A p=1, r=0 ,

1 Cz가 ,

A M 4 5 6 7 ,

2 4 5 ,

8 11 30 , L

6 30 2 30

EL .

1 n=1 , A p=2, r=0 ,

1 Cz가 ,

A M 2 40 , L

6 30 2 30

EL .

2 m=2 , A p=q=1 ,

2 Cz가 ,

A M M'가 2 40

, L 6 30 2 30 ,

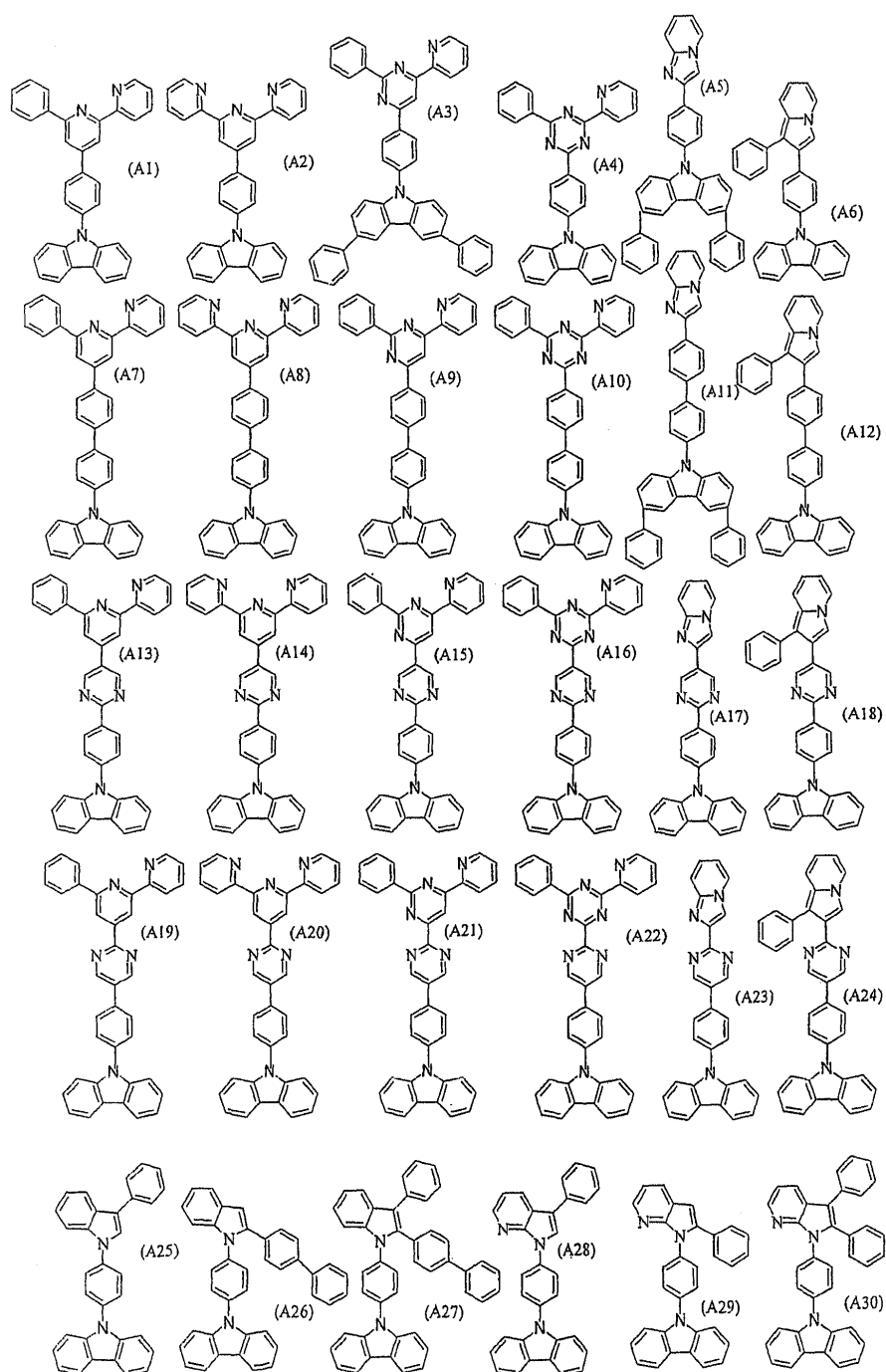
5 30 2 30

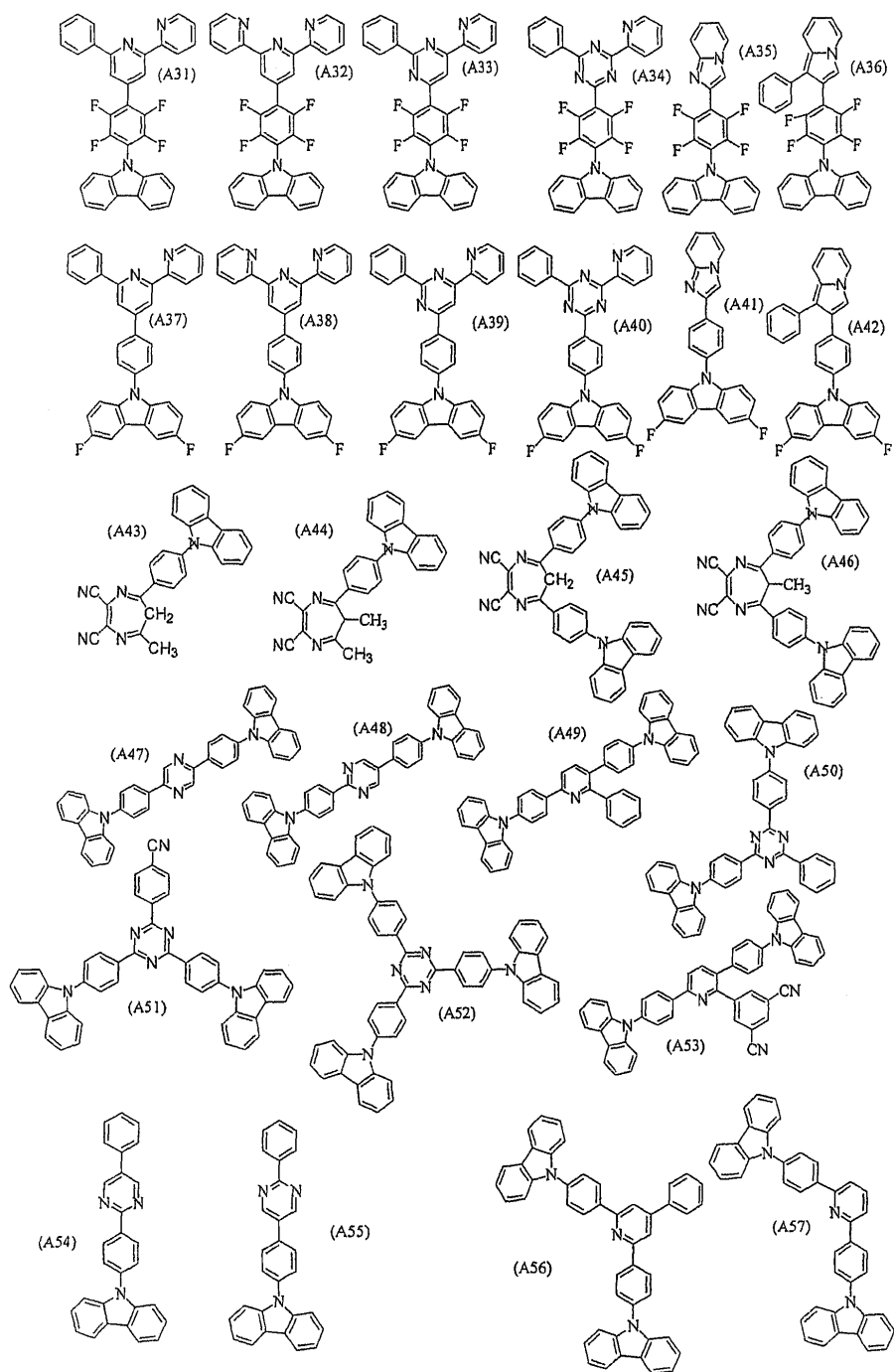
EL .

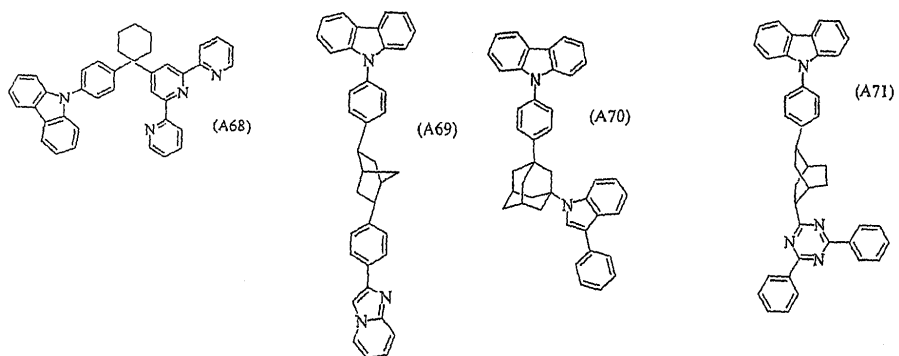
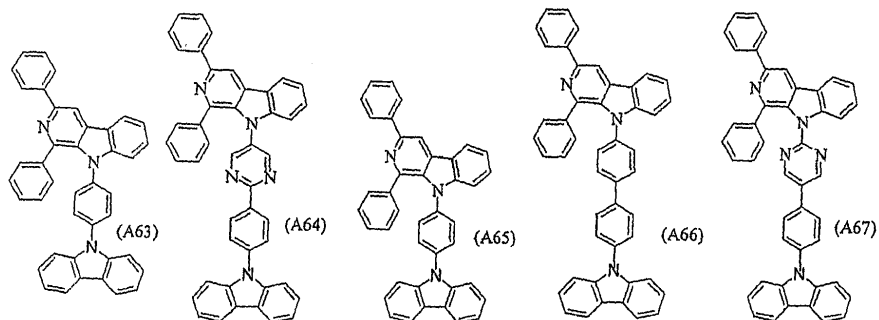
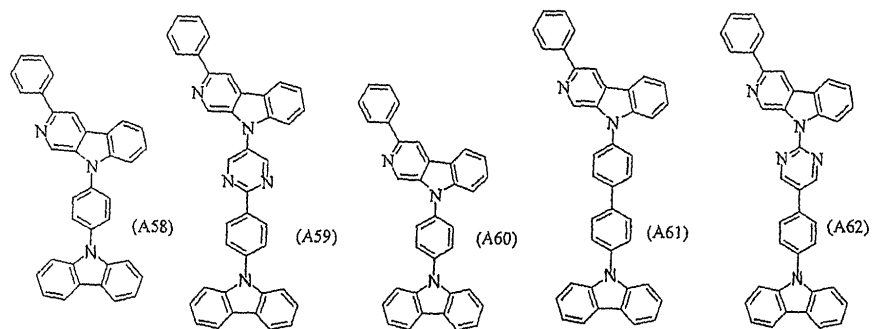
1 2 , Cz

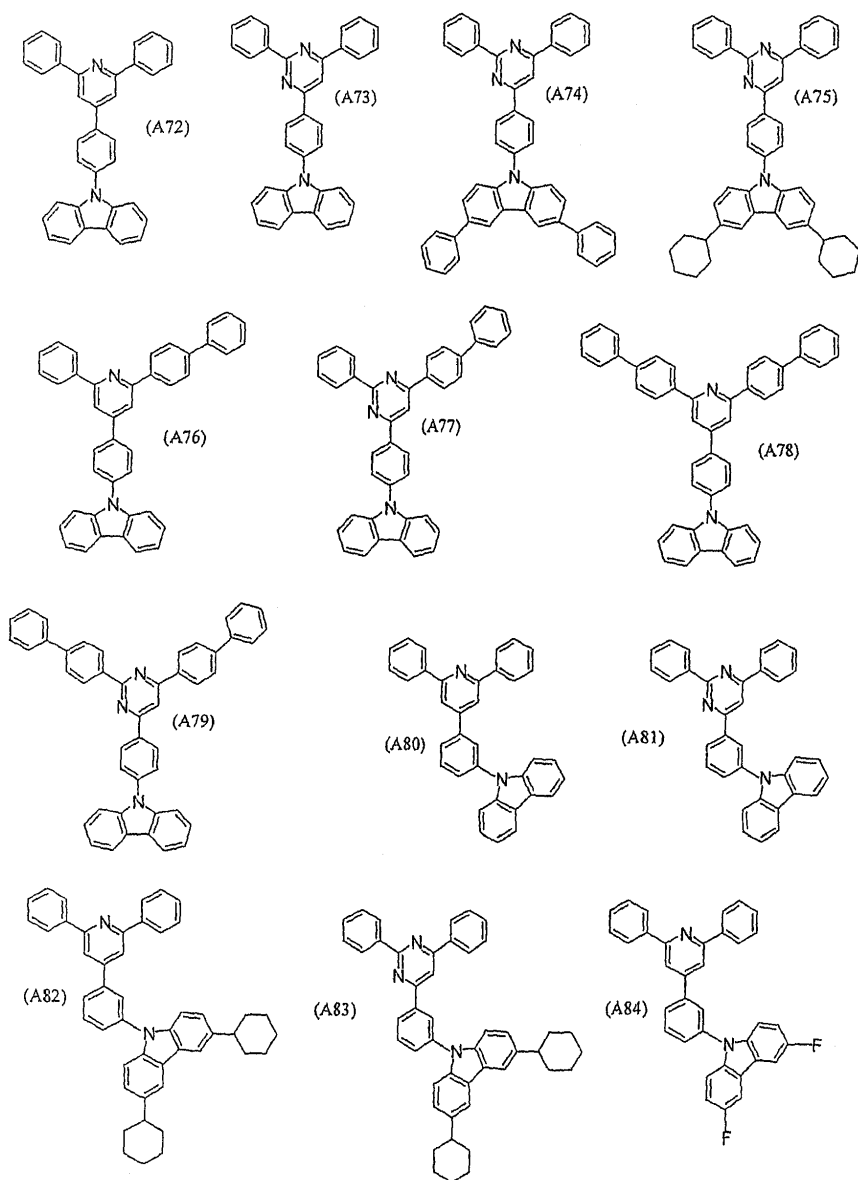
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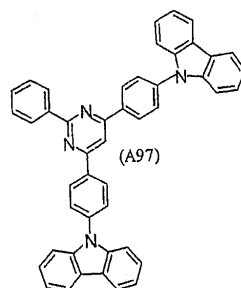
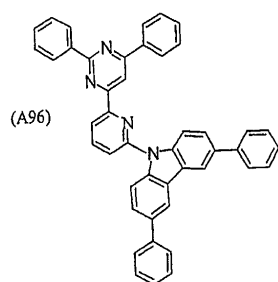
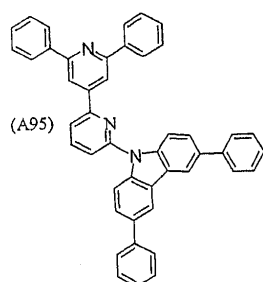
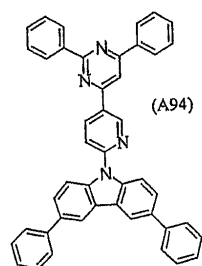
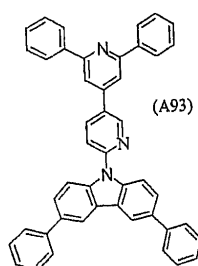
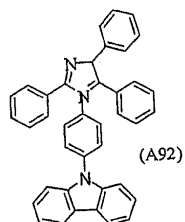
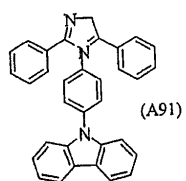
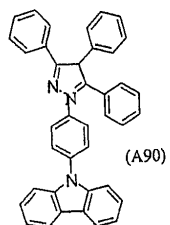
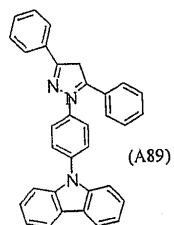
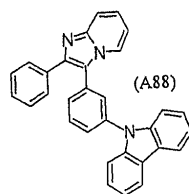
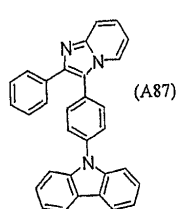
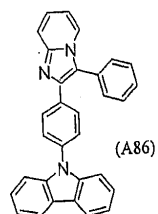
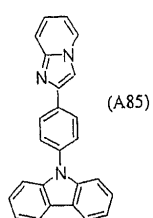
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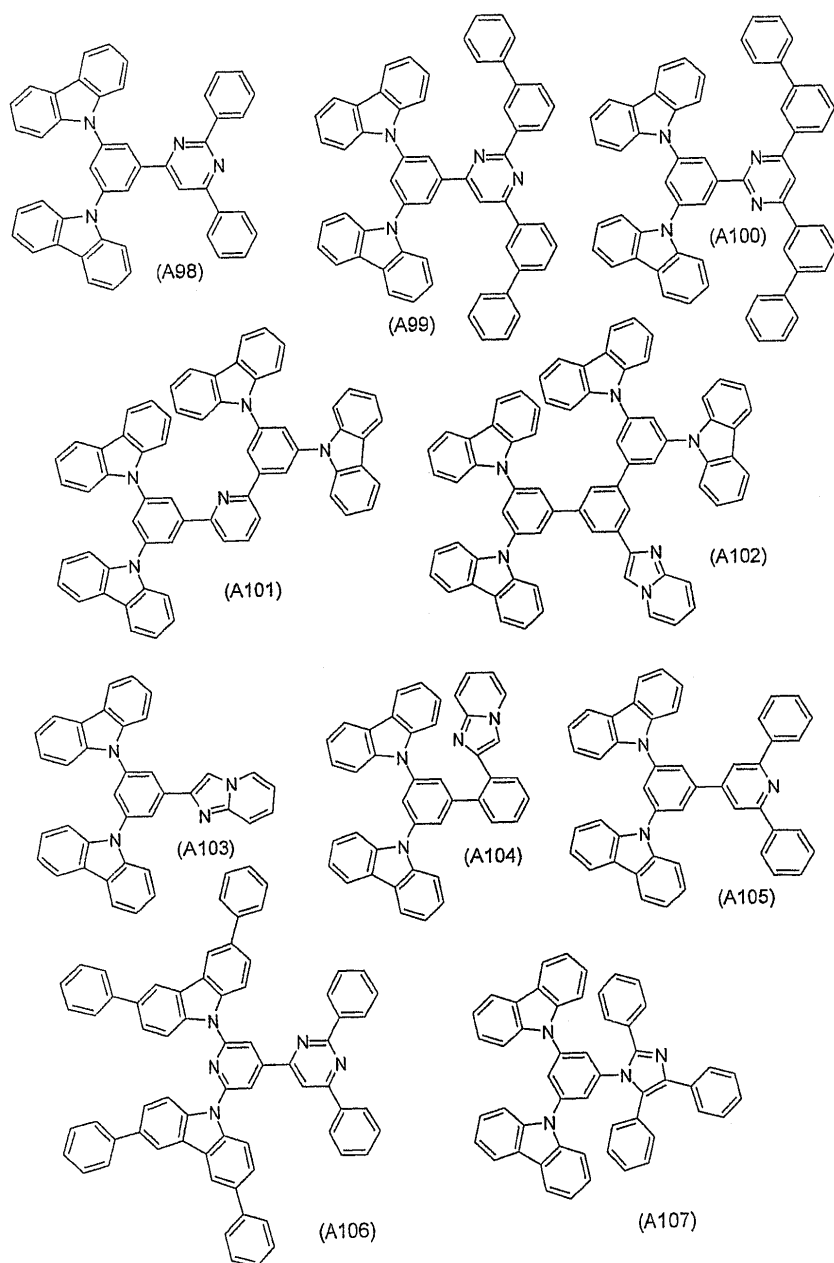


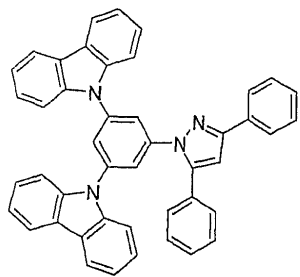




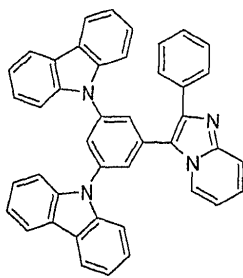




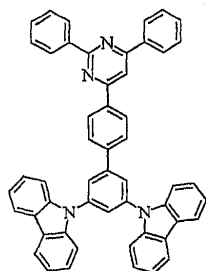




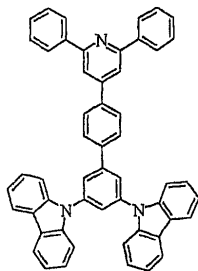
(A108)



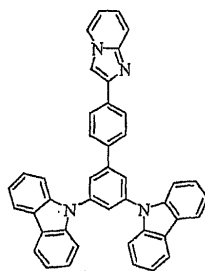
(A109)



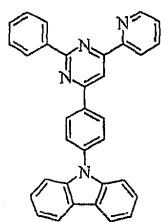
(A110)



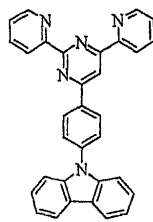
(A111)



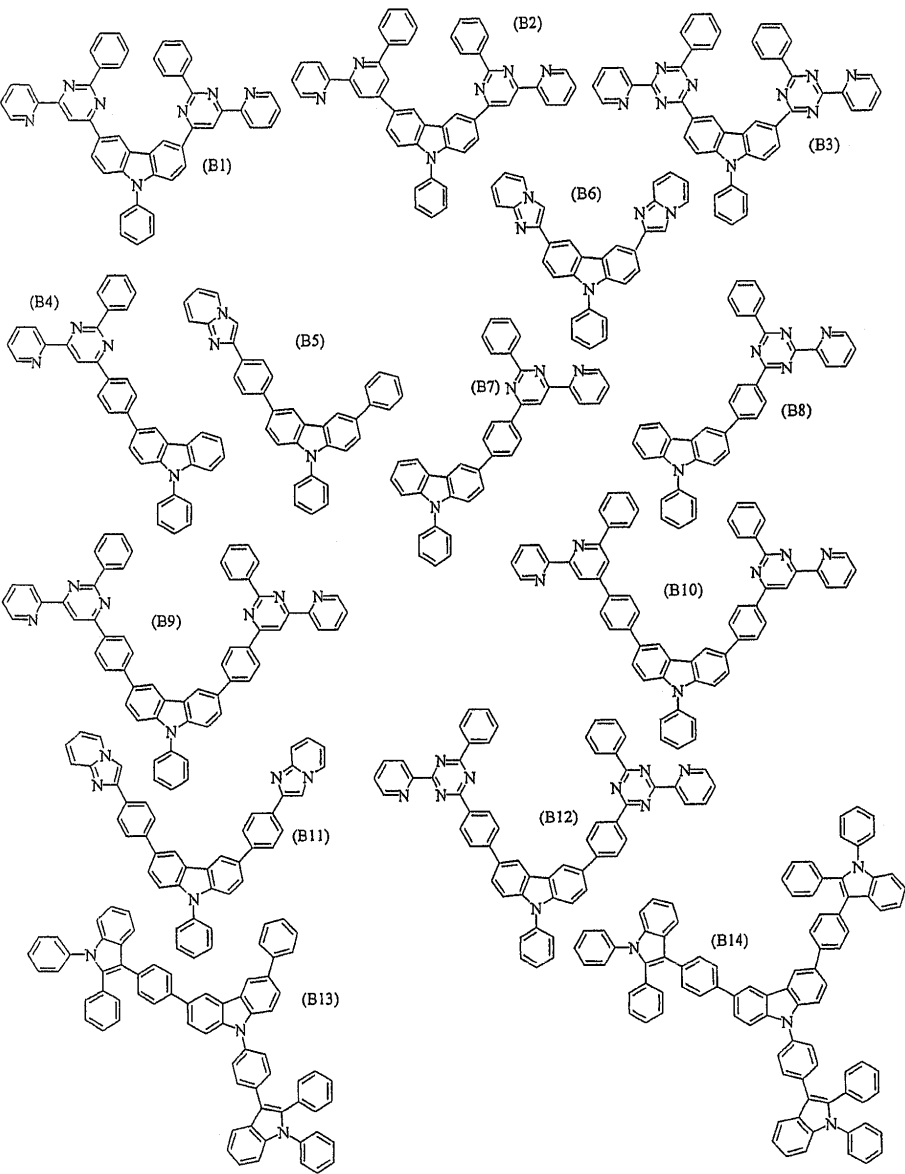
(A112)



(A113)

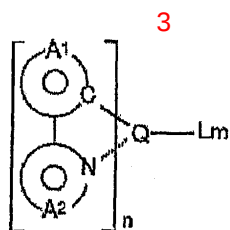


(A114)



	1	2	3	2.5	3.3 eV	, 2.5	3.2 eV
	1	2	1	2.8	3.8 eV	, 2.9	3.7 eV
L	EL	1	1 2	EL			E
	EL	EL			1 2		
	EL		가 (0.12, 0.10) 가	(0.17, 0.20) 가			
	EL	3					
가	EL	가	EL				
	1	2	1	2.8	3.8 eV	3	2.

[illegible]



A¹

A²

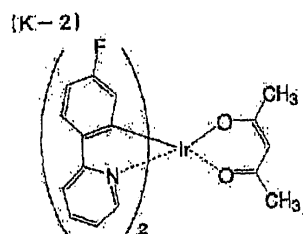
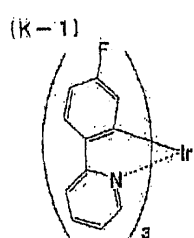
A¹
7,8-

Q 7 11

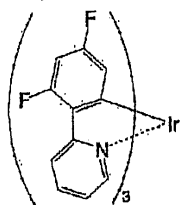
L β -

m n , Q가 2가 n=2, m=0 , Q가 3가 n=3 m=0, n=2
m=1 .

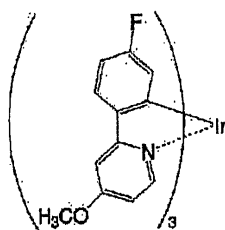
3



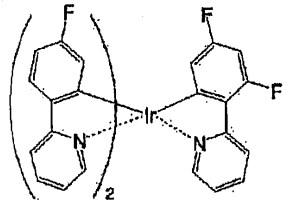
(K-3)



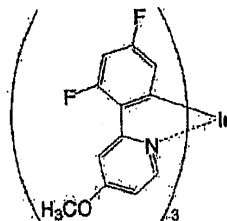
(K-4)



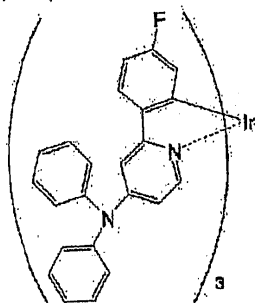
(K-5)



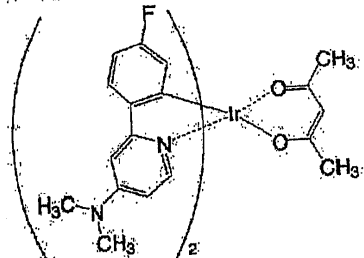
(K-6)



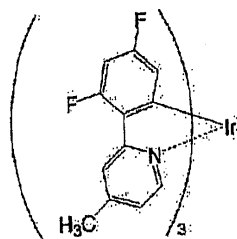
(K-7)

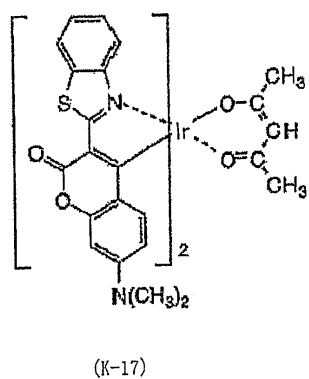
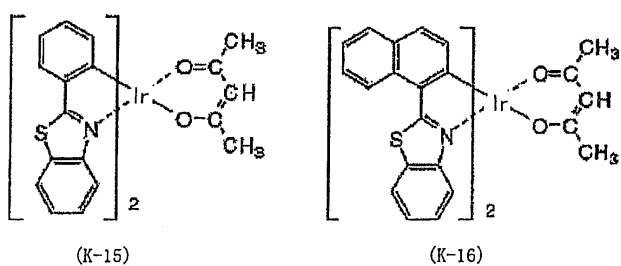
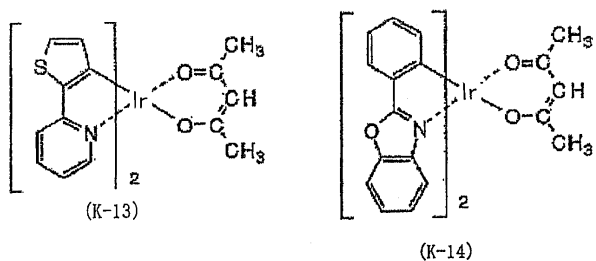
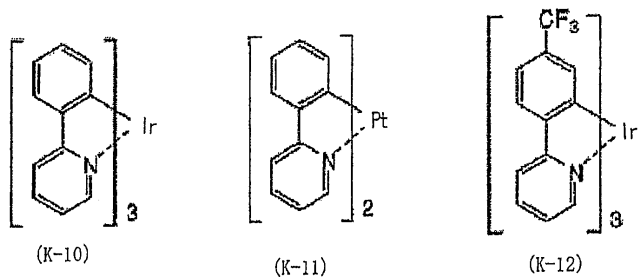


(K-8)

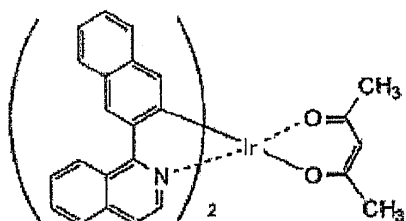


(K-9)

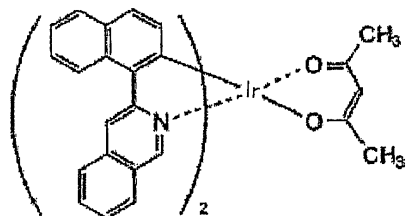




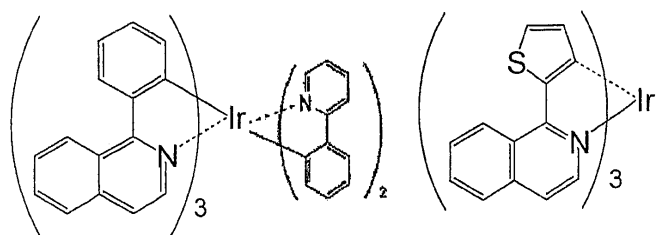
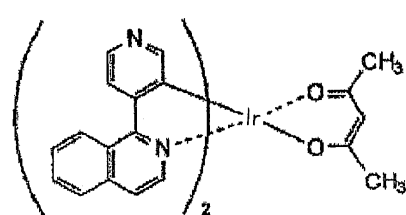
(K-18)



(K-19)



(K-20)



(K-21)

(K-22)

가

가

3, N,N'-
-N,N'-(3-)-1,1'- -4,4'- , N,N,N',N'-(4-)-1,1'- -4,4'- , N,N,N',N'
-(4-)-1,1'- -4,4'- , N,N'- -N,N'- -1,1'- -4,4'- , N,
N-()-N,N'-(4-n-)- -9,10- , N,N- (4- -4-)-4- -
(Pc) , H₂Pc, CuPc, CoPc, NiPc, ZnPc, PdPc, FePc, MnPc, ClAlPc, ClGaP
c, ClInPc, ClSnPc, Cl₂SiPc, (HO)AlPc, (HO)GaPc, VOPc, TiOPc, MoOPc GaPc-O-GaPc

가

가

5
 , 8-
) , (8-) , (8-) , (2- -8-
) , (8-) , (10- [h])
 , (10- [h]) , (2- -8-) , (2- -8-)
)(o-) , (2- -8-)(1-) , (2- -8-)(2-)

5
 , 2,5- (1-)-1,3,4- , POPOP, 2,5- (1-)-1,3,4- , 2,5- (1-)
)-1,3,4- , 2-(4'-tert-)-5-(4'-)-1,3,4- , 2,5- (1-)-1,3,4-
 , 1,4- [2-(5-)] , 1,4- [2-(5-)]-4-tert-
], 2-(4'-tert-)-5-(4'-)-1,3,4- , 2,5- (1-)-1,3,4- , 1,4-
 [2-(5-)] , 2-(4'-tert-)-5-(4'-)-1,3,4- , 2,5- (1-)
)-1,3,4- , 1,4- [2-(5-)]

가

EL , 4 eV , ITO , NESA ,
 , 4 eV , 가
 / , / , / ,
 , 2

EL 가
 , SiO_x , AlO_x , SiN_x , SiON, AlON, GeO_x , LiO_x , LiON, TiO_x , TiON, TaO_x , TaON, TaN_x , C ,
 , SiO_x , AlO_x , SiN_x , SiON, AlON, GeO_x C가
 , LiF, MgF₂ , CaF₂ , MgF₂ NaF가

EL

10%

가

EL

가

EL

가

가

5 nm

10 μm

가

, 10nm

가
 0.2 μm

가

가

가

-N-

가

EL

EL

1

2

EL

가

TV

3

1

(1) 3

3

(T1)

= 5:5:2

, 77K,

, SPEX

(10 μ mol/ FLUOROLOGII),

EPA(

(2) 1

1

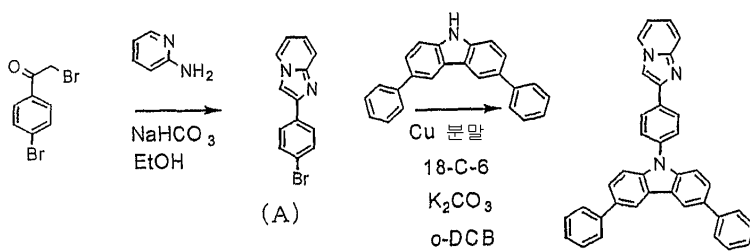
(10⁻⁵ /)

가

()

1((A5))

(A5)



(1) (A)

2,4'- (55) 가 9 15g(54) 100 Mℓ , 7.0g, 2- 5.2g
 (A) 12.5g(85%)

(2) (A5)

3,6- 2.9g(21 가) 6.1g(19), (A) 6.3g(23 가), 0.2g, 18- -6 1.7g 200
 30 Mℓ 가 , 3.0g(31%) 90 MHz ¹H-NMR FD-M

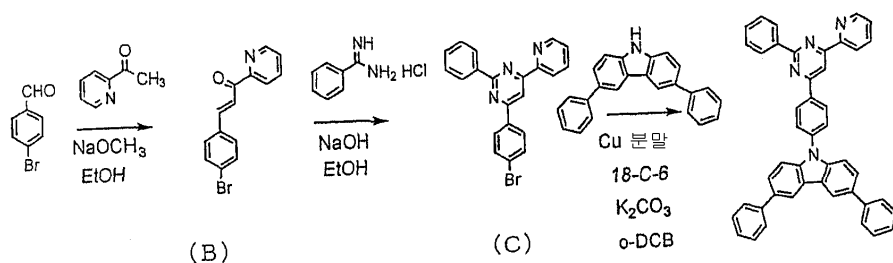
S() (A5) , FD-MS

FD-MS, C₃₇H₂₅N₃ = 511, m/z = 511(M⁺, 100).

3

2((A3))

(A3)



(1) (B)

4- 15g(81) 300 Mℓ , 2- 10g(83) 28%
15g(81) 가 7
(B) 9.5g(41%)

(2) (C)

(B) 9.5g(33) 80 Mℓ , 5.2g(34) 2.6g(65)
) 가 15 가
(C) 3.46g(27%)

(3) (A3)

3,6- 6.1g(19), (C) 8.9g(23), 0.2g, 18- -6 1.7g
2.9g(21) , o- 30 Mℓ 가 , 2
00 가 48
30 Mℓ 가 ,
3.9g(33%) 90 MHz ¹H-NMR FD-
MS (A3) , FD-MS

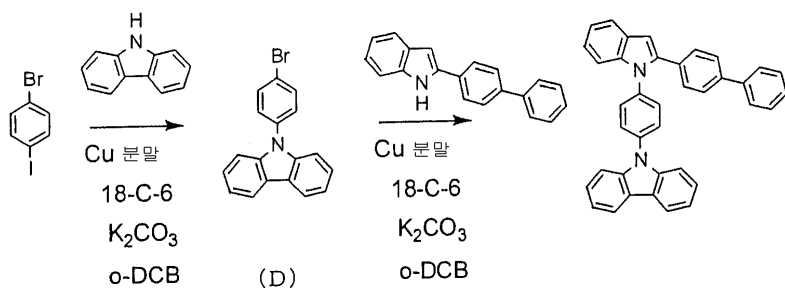
FD-MS, C₄₅H₃₀N₄ = 626, m/z = 626(M⁺, 100).

1

3

3((A26))

(A26)



(1) (D)

33g(0.20 mol), p- 68g(0.24 mol), 2.0g, 18- -6 18g 30g(0
 .22 mol) , o- 300 Mℓ 가 , 30 Mℓ 가 , 31g(49%)
 가 , 24 , ,

(2) (A26)

2- 5.4g(20), (D) 7.7g(24), 0.2g, 18- -61.8g, 3.0g
 (22)) , o- 30 Mℓ 가 , , 200
 가 48 , , ,
 30 Mℓ 가 ,
 1.7g(17%) 90 MHz ¹ H-NMR FD-M
 S (A26) , FD-MS

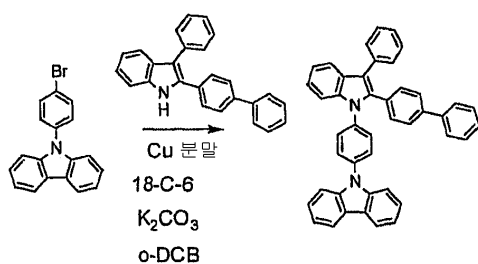
FD-MS, C₃₈ H₂₆ N₂ = 510, m/z = 510(M⁺, 100).

1

3

4((A27))

(A27)



3 (2) , 2- 2- -3-
 , 2.2g(19%) . 90 MHz ¹ H-NMR FD-MS (A27)
 , FD-MS

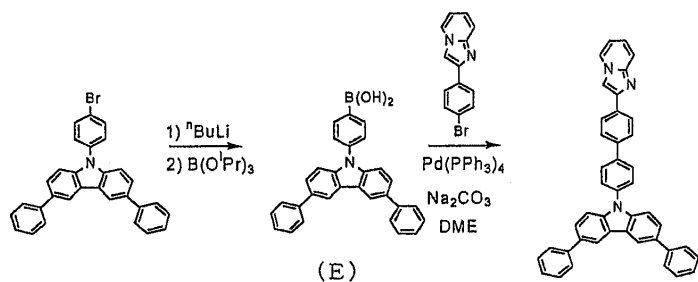
FD-MS, C₄₄ H₃₀ N₂ = 586, m/z = 586(M⁺, 100).

1

3

5((A11))

(A11)



(1) (E)

3,6- -9-p- 7.6g(16) 70 Mℓ , -60 n- (
 1.6 M) 12 Mℓ 가 , -60 0 2 , -60 8
 .8g 10 Mℓ 가 . 가 -60 0 2 , 5% 가

(E) 4.0g(58%)

(2) (A11)

2-(4'-
)- 0.17g 1,2- [1,2-a] 2.0g(7.3 30 Mℓ), (E) 3.5g(8.0 12 Mℓ) 가 8 가
2.0g(47%)
90 MHz ¹H-NMR FD-MS (A11), FD-MS

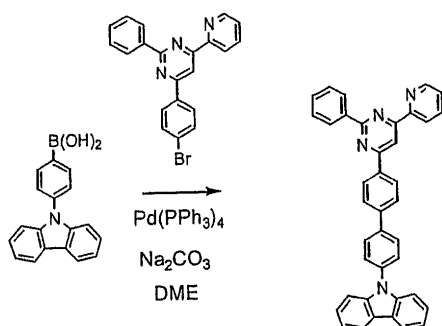
FD-MS, C₄₃H₂₉N₃ = 587, m/z = 587(M⁺, 100).

1

3

6((A9))

(A9)



2 (C) 2.0g(5.2 20Mℓ), 4-(9'- 1.7g(5.8 9 Mℓ) 가 8 (0.11g 1,2-)- 2.0M
1.8g(62%)
90 MHz ¹H-NMR FD-MS (A9), FD-MS

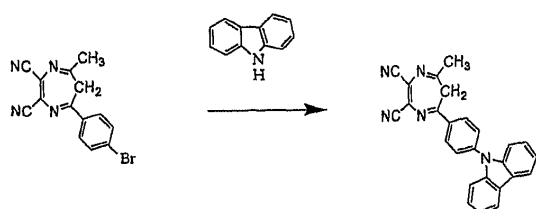
FD-MS, C₃₉H₂₆N₄ = 550, m/z = 550(M⁺, 100).

1

3

7((A43))

(A43)

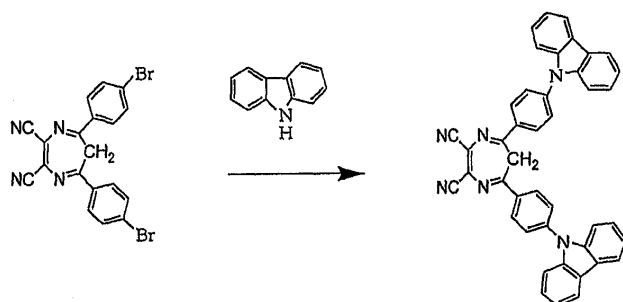


Ar 2.33g(10 200 Mℓ 3 2g(12)), 2,3- -5-(p-)-7- -6H-1,4-
-t- 0.06g(3 mol%), t- 2.0g(22) 100 Mℓ 가 100 Mℓ 가 1.2g(3
) (30%) NMR, IR FD-MS (A43), FD-
MS

FD-MS, C₂₆H₁₇N₅ = 399, m/z = 399(M⁺, 100).

8((A45))

(A45)

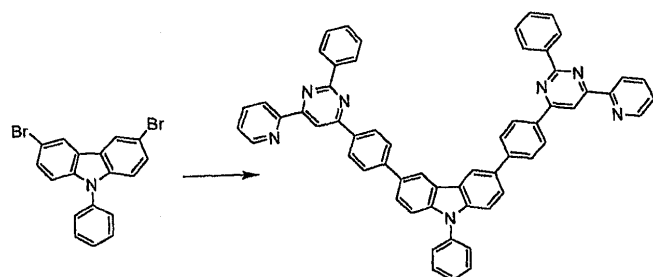


Ar, 20 Ml 3, 2,3-, -5,7- (p-)-6H-1,4-
 4.5g(10), 4g(24), () 0.28(1.5 mol%), -t-
 0.12g(3 mol%), t- 4.2g(442)
 가 () 100 Ml 160 Ml 가 , 100 18
)(29%) NMR, IR FD-MS (A45) 1.8g(2.9 , FD-MS

FD-MS, C₄₃H₂₆N₆ = 626, m/z = 626(M⁺, 100).

9((B9))

(B9)



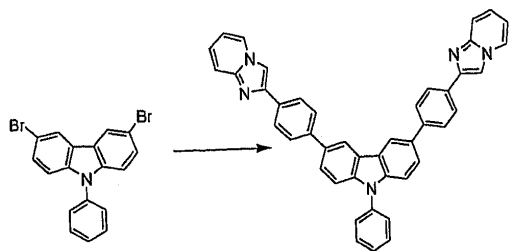
Ar, 4-(2'- -4'- -6'-) (11g, 32 , 2.6 eq), 3,6- -9-
 (5g, 12) () (0)(0.55g, 0.48 , 2% Pd) 1,2-
 (100 Ml) (2M, 10.2g, 96 , 3 /50Ml) 가 10
 90MHz ¹H-NMR FD-MS (B9) (8.5g, 83%) , FD-MS

FD-MS, C₆₀H₃₉N₇ = 857, m/z = 857(M⁺, 100).

, 1 , 3 .

10((B11))

(B11)



Ar (7.6g, 32%), 2.6%, 3,6- (5g, 12%), 1,2- (10g, 0.55g, 0.48, 2% Pd) (2M, 10.2g, 96%), 3, 10, 10 (5.7g, 76%)
 0 MHz ¹H-NMR FD-MS (B11) FD-MS

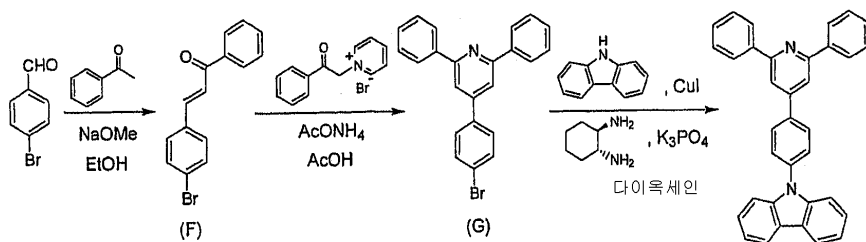
FD-MS, C₄₄H₂₉N₅ = 627, m/z = 627(M⁺, 100).

1

3

11(A72)

(A72)



(1) (F)

(F) 29.4g(84%)

(2) (G)

(F) 9.0g(31%), 12% (8.7g(31%), 19.3g(250%))
 (G) 10.6g(88%)

(3) (A72)

(G) 3.5g(9%), 1.7g(10%), 0.09g(0.5%), 4.0g(19%)
 1,4-18 (5%), 15 Ml (93%), 90MHz ¹H-NMR FD-MS (A72)
 FD-MS

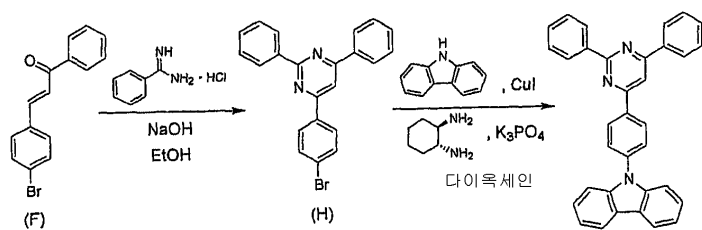
FD-MS, C₃₅H₂₄N₂ = 472, m/z = 472(M⁺, 100).

1

3

12((A73))

(A73)



(1) (H)

2 (2) (B) 11 (F)
(H) 7.8g(61%)

(2) (A73)

11 (3) (G) (H) 3.3g(76%)
FD-MS 90MHz ¹H-NMR FD-MS (A73)

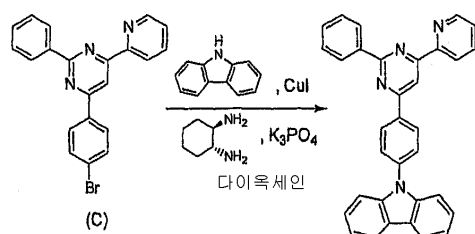
FD-MS, C₃₄H₂₃N₃ = 473, m/z = 473(M⁺, 100).

1

3

13((A113))

(A113)



11 (3) (G) 2 (C)
1.5g(50%) 90MHz ¹H-NMR FD-MS (A113)
FD-MS

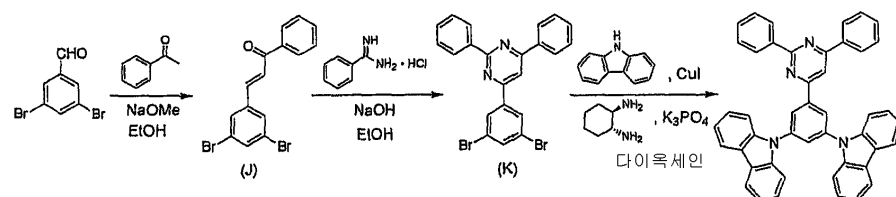
FD-MS, C₃₃H₂₂N₄ = 474, m/z = 474(M⁺, 100).

1

3

14((A98))

(A98)



(1) (J)

2 (1) , 4-

3,5-

(J) 19.2g(92%) , 2-

(2) (K)

2 (2) , (B) (J) (K) 5.5g(45%) .

(3) (A98)

(K) 3.0g(6), 2.3g(14), 0.12g(0.6) 4.2g(20)
 1,4- 21 Mℓ , -1,2- 0.8 Mℓ(6) 가 ,
 18 가 2 1,4-
 21 Mℓ , 0.12g(0.6) , 2.9g(14) -1,2-
 0.8 Mℓ(6) 가 , 18 가
 , 가 2
 3.3g(80%) , 30 Mℓ 가 ,
 , FD-MS 90 MHz ¹ H-NMR FD-MS (A98)

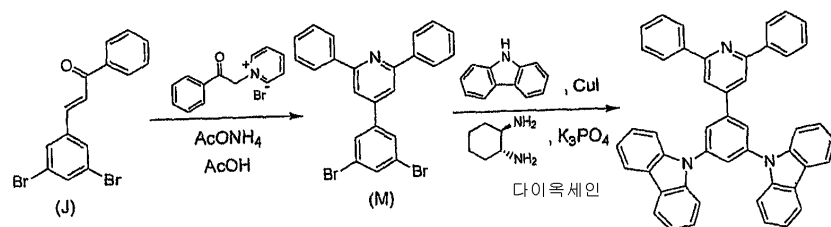
FD-MS, C₄₆ H₃₀ N₄ = 638, m/z = 638(M⁺, 100).

1

3

15((A105))

(A105)



(1) (M)

11 (2) , (F) 14 (1) (J)
(M) 10.0g(88%) .

(2) (A105)

14 (3) , (K) (M) 2.9g(71%)
 90MHz ¹ H-NMR FD-MS (A105)

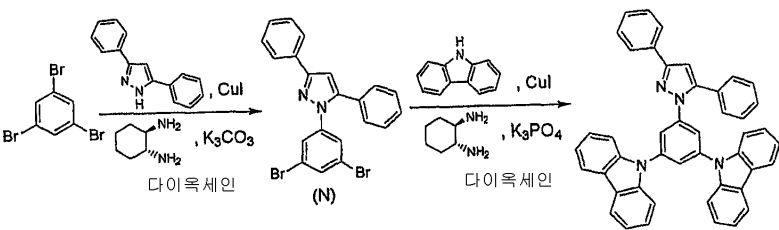
FD-MS, C₄₇ H₃₁ N₃ = 637, m/z = 637(M⁺, 100).

1

3

16((A108))

(A108)



(1) (N)

1,3,5- 11.9g(86) 13.0g(41), 3,5- 10.0g(45), 0.8g(4)
41) 가 , 1,4- 50 Mℓ , -1,2- 4.9 Mℓ(
가 , 2 , , 가 ,
(N) 2.0g(11%) .

(2) (A108)

(N) 2.0g(4), 1.4g(8), 0.08g(0.4) 2.9g(14)
1,4- 15 Mℓ , -1,2- 0.5 Mℓ(4) 가 ,
18 가 , 가 2
15 Mℓ , 0.08g(0.4), 2.9g(14), -1,2- 1,4-
0.5 Mℓ(4) 가 , 14 가 .
가 , 2 ,
5 Mℓ , 15 Mℓ 가 ,
5:2 2.4g(87%) 90MHz ¹ H-NMR FD-
MS (A108) , FD-MS
FD-MS, C₄₅ H₃₀ N₄ = 626, m/z = 626(M⁺, 100).
1 3

[3]

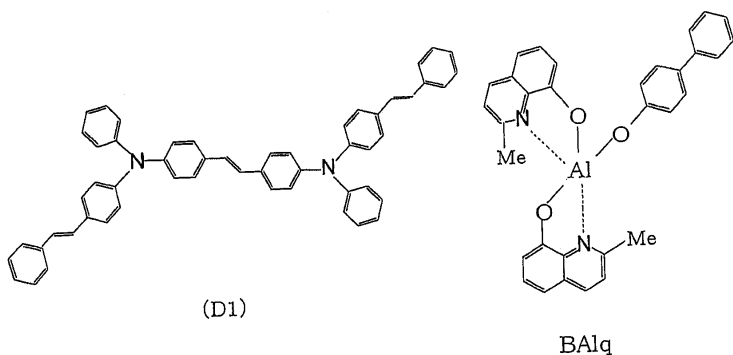
	화합물	1중합 에너지 갭 (e V)	3중합 에너지 갭 (e V)
합성예 1	A 5	3. 2	2. 7
합성예 2	A 3	3. 1	2. 7
합성예 3	A 2 6	3. 1	2. 6
합성예 4	A 2 7	3. 0	2. 6
합성예 5	A 1 1	3. 0	2. 7
합성예 6	A 9	3. 1	2. 5
합성예 9	B 9	3. 2	2. 6
합성예 10	B 1 1	3. 2	2. 7
합성예 11	A 7 2	3. 5	2. 8
합성예 12	A 7 3	3. 3	2. 8
합성예 13	A 1 1 3	3. 2	2. 7
합성예 14	A 9 8	3. 5	2. 9
합성예 15	A 1 0 5	3. 4	2. 9
합성예 16	A 1 0 8	3. 7	3. 0

1

25mm×75mm×1.1mm ITO (GEOMATEC)
5 , UV 30 .
60nm N,N'- (N,N'- -4-)-N,N'- -4,4'-

-1,1'- (TPD232) . TPD232 . TPD232
 20nm 4,4'- [N-(1-)-N-] (NPD)
 , , NPD 40nm (A5)
 , 1 (D1) , (A5):(D1) 40:3 (D1)
 , 2.79 eV (A5) (D1)
 20nm BA1q(Me) . BA1q
 () Li(Li : (SAES GATTERS)) Alq
 () Alq:Li (10nm) . Alq: Li Al
 EL

5.0V 150 cd/m² , 6.3 cd/A
 (0.14, 0.16) 가 .

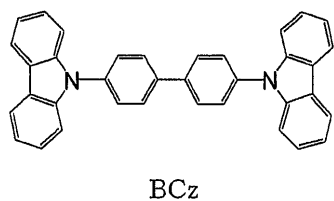


2 8

1 , (A5) , 4 EL
 , 가 , , 4 .

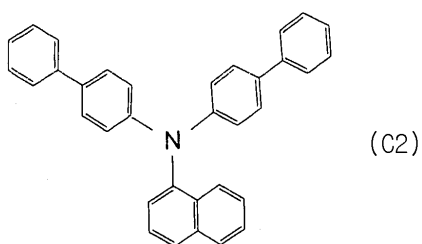
1

1 , (A5) , BCz 4
 EL , 가 , , , 4 .



2

1 , (A5) EL 2001-288462 (C2)
 4 , 가 , , , .



[4]

	발광층의 유기 호스트 재료	전압 (V)	발광 휘도 (cd/m ²)	발광 효율 (cd/A)	발광색	색도 좌표
실시예 1	A 5	5. 0	1 5 0	6. 3	청	(0. 14, 0. 16)
실시예 2	A 3	5. 8	1 6 0	5. 8	청	(0. 15, 0. 17)
실시예 3	A 2 6	6. 0	1 3 2	5. 2	청	(0. 14, 0. 16)
실시예 4	A 2 7	6. 0	1 5 4	5. 9	청	(0. 14, 0. 16)
실시예 5	A 1 1	5. 2	1 8 0	6. 3	청	(0. 15, 0. 17)
실시예 6	A 9	6. 2	1 4 5	5. 1	청	(0. 15, 0. 16)
실시예 7	B 9	5. 7	1 5 1	5. 7	청	(0. 15, 0. 17)
실시예 8	B 1 1	5. 0	1 8 1	6. 9	청	(0. 15, 0. 17)
비교예 1	B C z	8. 5	7 0	2. 4	청	(0. 14, 0. 16)
비교예 2	C 2	6. 5	6 5	2. 6	청	(0. 14, 0. 16)

4, 1 2 BCz (C2), EL

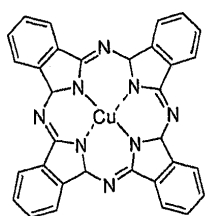
9

25mm×75mm×0.7mm ITO ()
5, UV 30

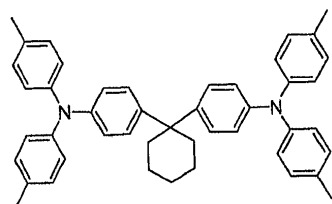
10nm (CuPc) CuPc Cu
Pc 30nm 1,1'- [4-N,N- ()] (TPAC)
TPAC Ir TPAC 30nm (A72)
Ir [(4,6-)- -N,C 2'
] (Flrpic) 가 Alq 7 %
30nm Alq 150nm Al: Li
LiF 0.2nm EL

F

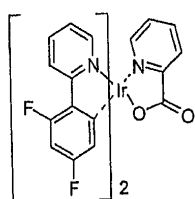
6.6V, 0.59 mA/cm², 8 gcd/m²
(018, 0.39), 14.98 cd/A



CuPc



TPAC



Flrpic

10 12

9 (A72)

5

EL

5

3

9 (A72)

BCz

EL

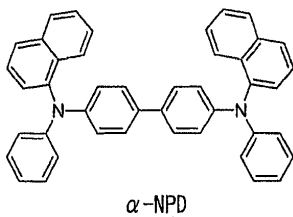
5

4

3

TPAC
Alq4,4'- [N-(1-)-N-]
BAIq(α -NP
EL

5



[5]

	발광층의 유기 호스트 재료	전압 (V)	전류 밀도 (mA/cm ²)	발광 휘도 (cd/m ²)	발광 효율 (cd/A)	발광색	색도 좌표
실시예 9	A 7 2	6 . 6	0 . 5 9	8 9	14.98	청록색	(0.18, 0.39)
실시예 10	A 9 8	6 . 4	0 . 5 4	8 6	15.89	청록색	(0.18, 0.40)
실시예 11	A 1 0 5	6 . 9	0 . 8 4	9 9	11.76	청록색	(0.17, 0.40)
실시예 12	A 7 3	6 . 0	1 . 0 0	9 9	9.91	청록색	(0.16, 0.39)
비교예 3	B C z	7 . 8	1 . 7 0	9 8	5.80	청록색	(0.16, 0.37)
비교예 4	B C z	7 . 6	1 . 0 9	9 9	9.15	청록색	(0.17, 0.37)

5

3 4

BCz

EL

가

1 2

가

(57)

1.

1 2

1

 $(Cz-)_{nA}$

2

 $Cz(-A)_m$

,

Cz

,

 $A \quad A$ $n \quad m \quad 1 \quad 3$

A

 $(M)_p-(L)_q-(M')_r$ $[\quad A \quad ,$ $M \quad M' \quad 2 \quad 40$

,

 $L \quad , \quad 6 \quad 30 \quad , \quad 5$ $30 \quad , \quad 2 \quad 30 \quad ,$ $p \quad 0 \quad 2, q \quad 1 \quad 2, r \quad 0 \quad 2 \quad , \quad p+r \quad 1 \quad .]$

2.

1 ,

 $1 \quad n=1 \quad , \quad A \quad p=1, r=0 \quad ,$ $1 \quad Cz \uparrow \quad 4 \quad 5 \quad 6 \quad 7 \quad , \quad A \quad M$ $2 \quad 4 \quad 5 \quad , \quad 8 \quad 11 \quad 3$ $0 \quad , \quad 2 \quad 30 \quad , L$

3.

1 ,

 $1 \quad n=2 \quad , \quad A \quad p=1, r=0 \quad ,$ $1 \quad Cz \uparrow \quad 4 \quad 5 \quad 6 \quad 7 \quad , \quad A \quad M$ $2 \quad 4 \quad 5 \quad , \quad 8 \quad 11 \quad 30$ $2 \quad 30 \quad , L$

4.

1 ,

- 1 $n=1$, A $p=2, r=0$,
- 1 Cz가 , A M
- 6 30 , 2 40 , L 2 30 ,
- 5.
- 1 ,
- 2 $m=2$, A $p=q=1$,
- 2 Cz가 , A M M'가
- 6 2 40 , 5
- 30 , L 6 30 , 2 30 ,
- 6.
- 1 ,
- Cz가 .
- 7.
- 6 ,
- Cz가 .
- 8.
- 6 ,
- 가 .
- 9.
- 1 ,
- 1 2 3 2.5 3.3 eV .
- 10.
- 1 ,
- 1 2 1 2.8 3.8 eV .
- 11.
- 1 1 ,
- 12.
- 1 ,
- 13.
- 1 ,
- 14.

1

15.

11

가

16.

11

17.

11

3

18.

11

专利名称(译)	有机电致发光器件材料和使用其的有机电致发光器件		
公开(公告)号	KR1020040094842A	公开(公告)日	2004-11-10
申请号	KR1020047014947	申请日	2003-03-19
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摘要(译)

本发明涉及一种有机电致发光器件用材料，该材料包括具有与含氮杂环基键合的芳基咔唑基或咔唑基亚烷基的化合物，以及夹在阴极和阳极之间的有机薄膜层，在有机电致发光器件中，可以提供一种有机电致发光器件，其中至少一层有机薄膜层含有用于有机电致发光器件的材料，并且具有高色纯度并发出蓝光。以及使用其的有机电致发光器件。

$$(CZ^-)_n A$$