

(19)
(12)(KR)
(A)(51) 。 Int. Cl. ⁷
C09K 11/06(11)
(43)2001 - 0112635
2001 12 20(21) 10 - 2001 - 0032909
(22) 2001 06 12

(30) 09/593,127 2000 06 13 (US)

(71)

343

(72)

14580

34

14612

132

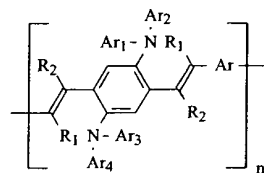
(74)

:

(54)

, , 1 :

1



R₁ R₂ ; 1 24 ; 6 40 ; 4 40 ; ;

Ar_1, Ar_2, Ar_3, Ar_4 Ar 6 40 ; 4 40
;

1

1 2 (EL) ;

2 2 EL ;

3 EL ;

4 22 , (photoluminescence) 22 EL
;

5 17 , 17 EL
;

6 22 EL - .

10: 20: ,

30: 40:

50: EL 60:

100: 200:

300: 400:

500: 600: EL

700: 1000:

2000: 3000:

4000:

(electroluminescent, EL)

(light emitting diode, LED)

(EL)

LED

LED

가

가

EL

가

() (PPV)

1990

(Burroughes et al.)

EL

[Burroughes, J. H., Nature, 347, 539 - 541(1990)].

(PF)[O

hiori, Y. et al., Jpn. J. Appl. Phys. Part 2, 20, L1941 - L1943(1991)], (p -

I., Adv. Mater., 4, 36 - 37(1992)]

()

, PPV

LED,

가

가

PPV

LED

PPV가

PPV

LED

PPV

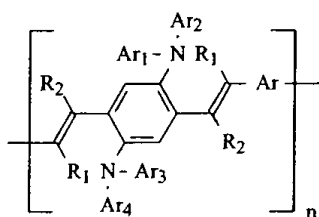
[S

tenger - Smith, J. D. et. al., Macromolecules 31, 7566 - 7569].

EL

1

1



R_1 R_2 , 1 24 , 6 40 , 4 40 ;

Ar_1, Ar_2, Ar_3, Ar_4 Ar 6 40 , 4 40

Ar

Ar

Ar

(1) - (electron - hole)

EL

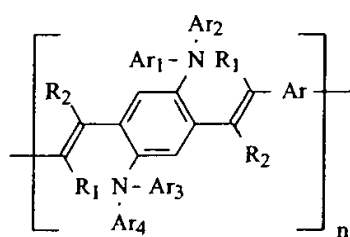
(2) ;

(3) .

1

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1

R₁ R₂ , 1 24

, 6 28

, 4 40

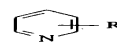
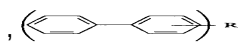
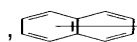
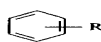
R₁ R₂Ar₁, Ar₂, Ar₃, Ar₄ Ar

6 40

;

Ar₁, Ar₂, Ar₃, Ar₄ Ar

4 40

, Ar₁, Ar₂, Ar₃ Ar₄

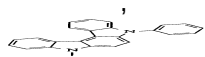
,

R , , 1 24
 , 4 40
 ;

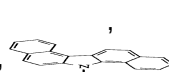
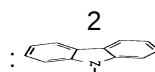
, 6 28

, Ar₁ Ar₂ Ar₃ Ar₄
 40

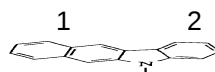
Ar₃ Ar₄



, Ar₁ Ar₂



, Ar₁ Ar₂

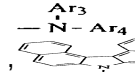


Ar₃ Ar₄

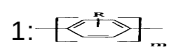
1



12



Ar 1 .

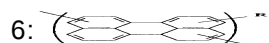
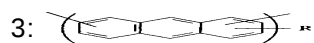
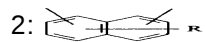


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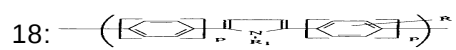
R , , 1 24
 , 4 40
 ; m 1 3 ;

, 6 28

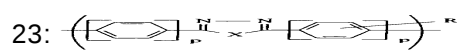
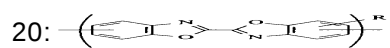
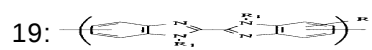
2 24 , R 1 .



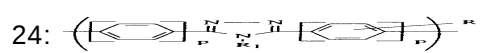
, R_1 , X_2 ;



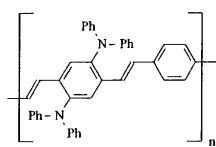
, R_1 , $p = 0, 2$;



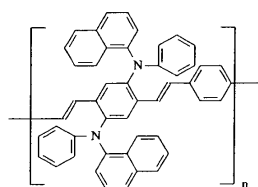
, $X = O, S$, $p = 0, 2$;



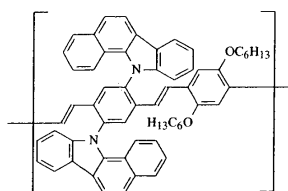
, R_1 , $p = 0, 2$.



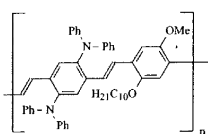
중합체 1



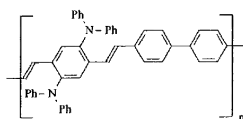
중합체 2



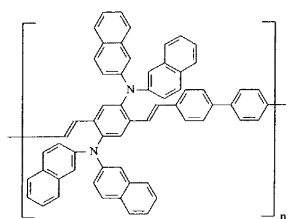
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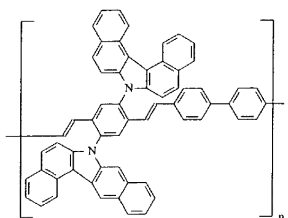
중합체 4



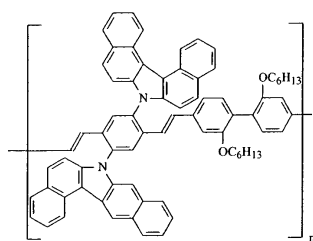
중합체 5



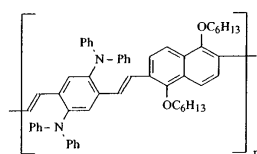
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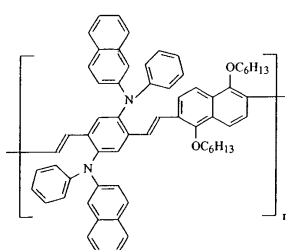
중합체 7



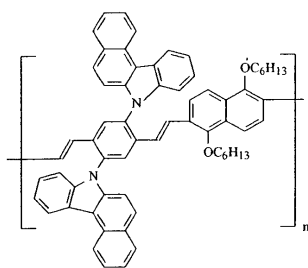
중합체 8



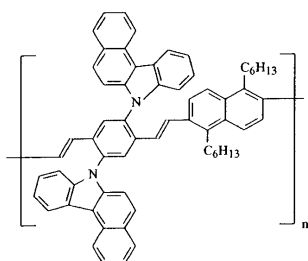
중합체 9



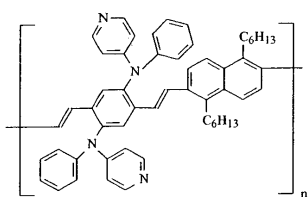
중합체 10



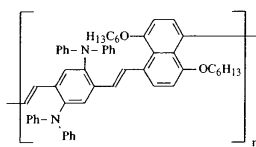
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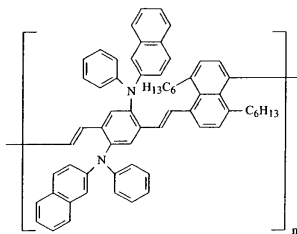
중합체 12



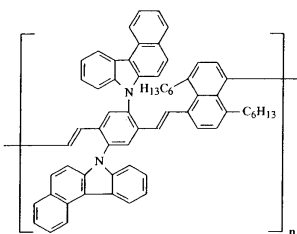
중합체 13



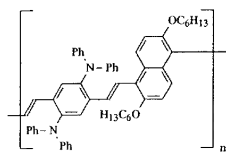
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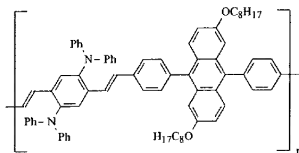
중합체 15



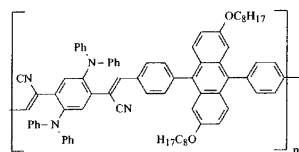
중합체 16



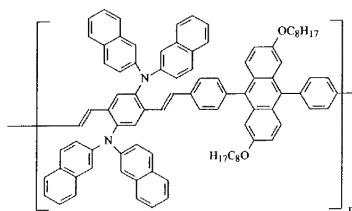
중합체 17



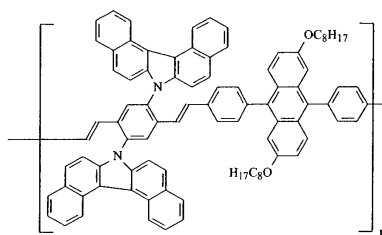
중합체 18



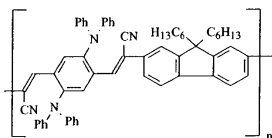
중합체 19



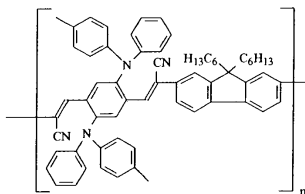
중합체 20

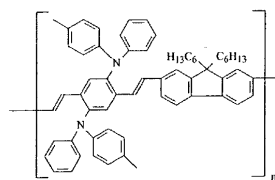


중합체 21

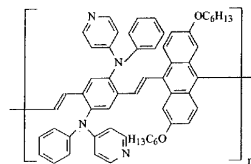


중합체 22

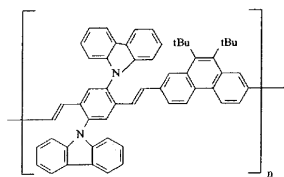
중합체 23
- 12 -



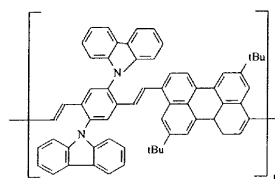
중합체 24



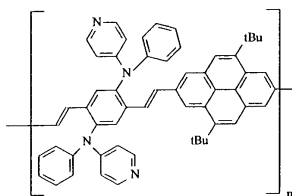
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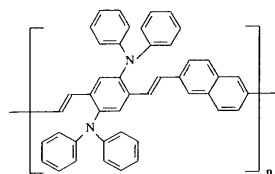
중합체 26



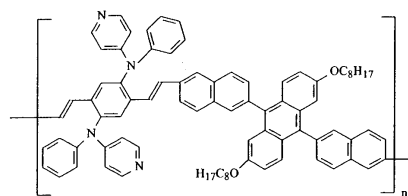
중합체 27



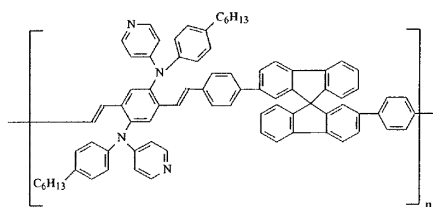
중합체 29



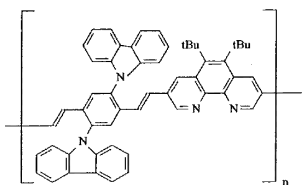
중합체 30



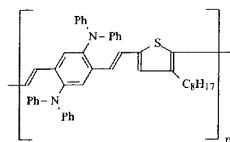
중합체 31



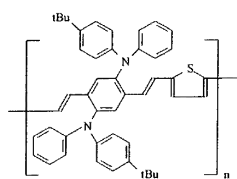
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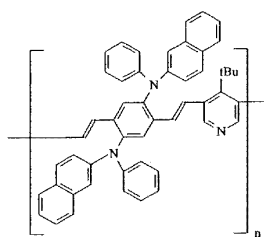
중합체 33



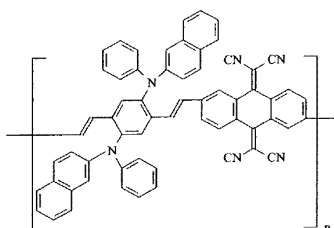
중합체 34



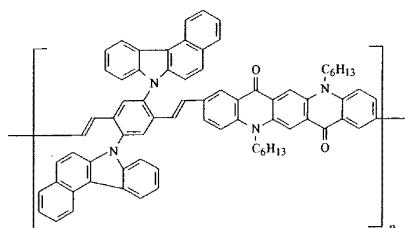
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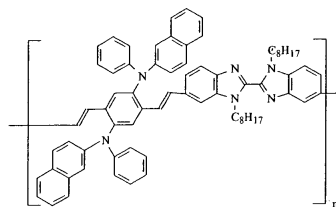
중합체 36



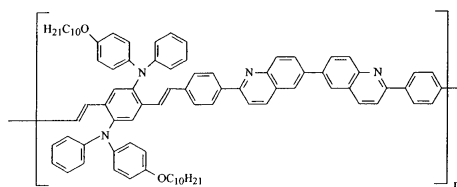
중합체 37



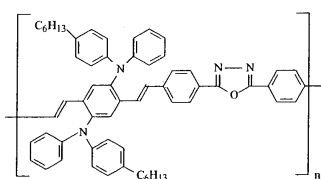
중합체 38



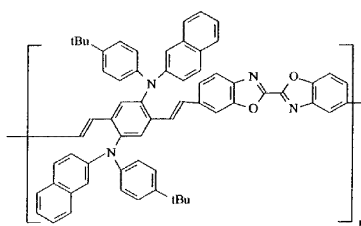
중합체 39



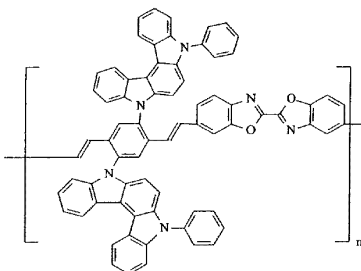
중합체 40



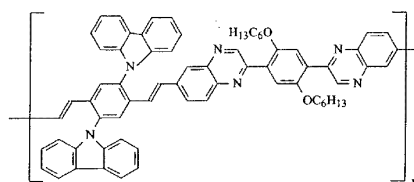
중합체 41



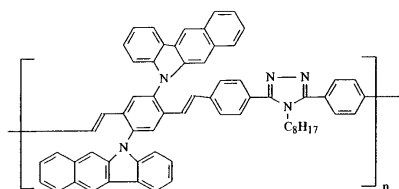
중합체 42



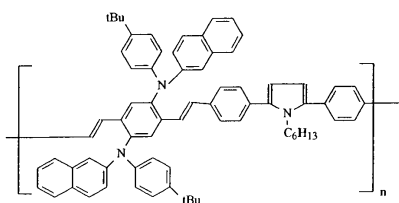
중합체 43



중합체 44



중합체 45



중합체 46

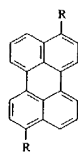


, Ar

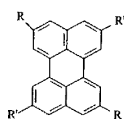
(Horner - Emmons) , (Knoevenagel) , (Heck) (Wittig) ,
269, 376(1995)] [Science,
t - 1
6
1 EL (30)
(40) 2 (40)
EL (50) (20) (30) , (60) (40)
(10)
2 EL 2 EL (300)
(400) , (500) (600) (200)
, (700) (100)
2 EL 2 EL
4,356,429 ; (B) : (A)
05 - ; (C) 5,776,622
69,292 ; (D) 09/191,7
4,7
3 EL (2000) (4000)
(3000) (3000) (3000)
(1000)
EL
(FD) 2
% EL EL EL
EL EL EL
4,769,292 EL

EL

:

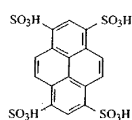


FD 1 R=H

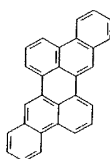
FD 2 R=CO₂Pr-i

FD 3 R=H, R'=t-Bu

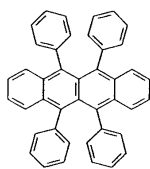
FD 4 R=R'=t-Bu



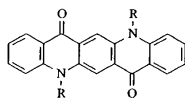
FD 5



FD 6



FD 7

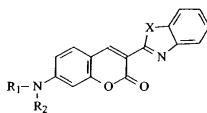
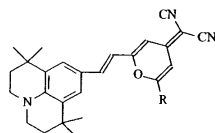


FD 8 R=H

FD 9 R=Me

FD 10 R=Pr-i

FD 11 R=2-에틸헥실

FD 12 R₁=R₂=Me, X=OFD 13 R₁=R₂=헥실, X=OFD 14 R₁=R₂=페닐, X=OFD 15 R₁=R₂=Me, X=SFD 16 R₁=R₂=헥실, X=SFD 17 R₁=R₂=페닐, X=S

FD 18 R=n-헥실

FD 19 R=페닐

(3000)

09/191,70

5

EL
5,776,622

Mg, Li,

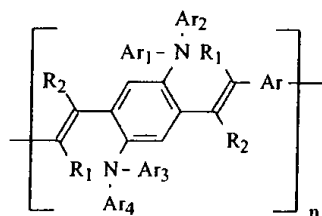
5,429,884

가

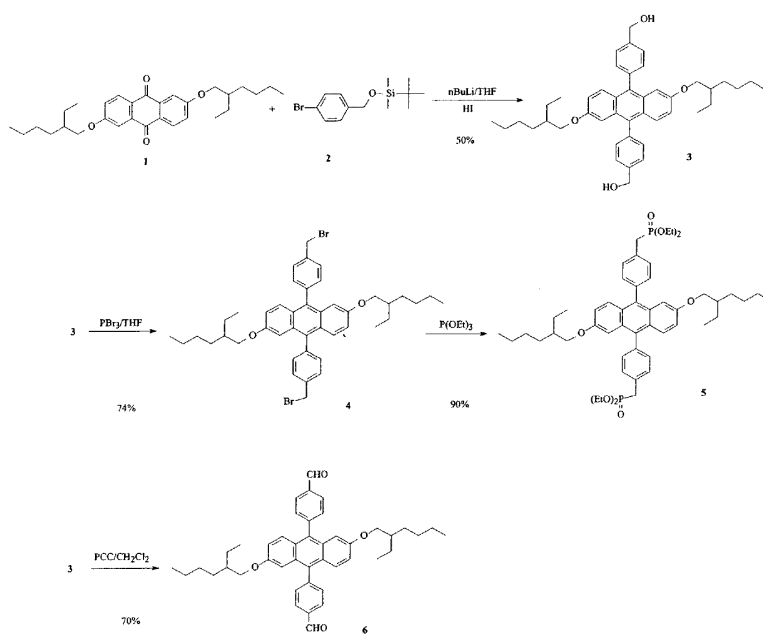
가 1

1 6

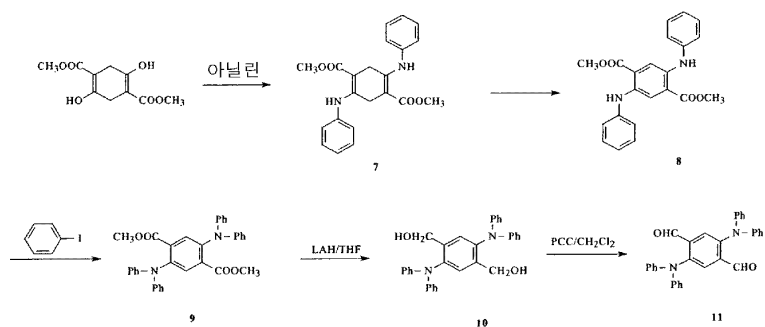
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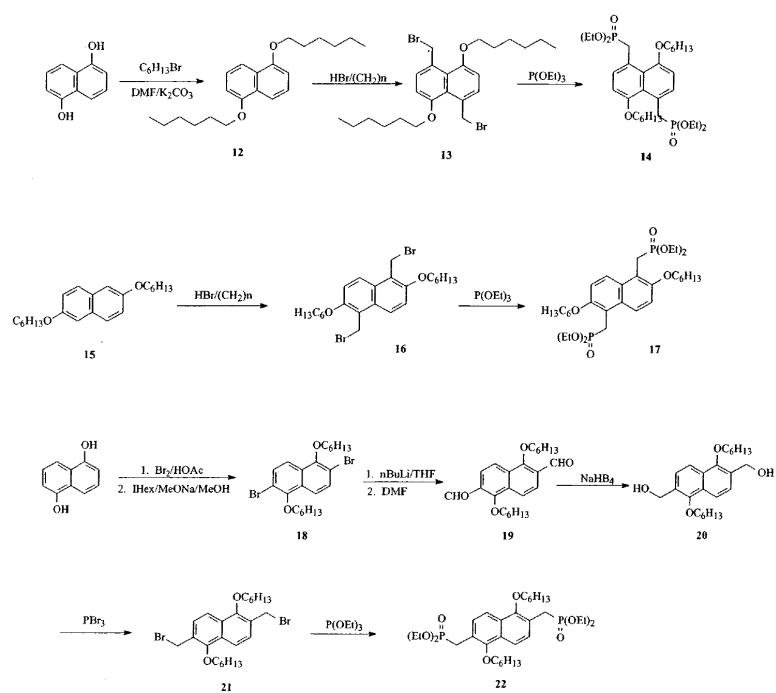
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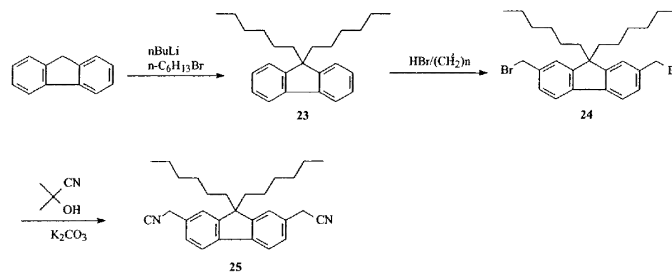
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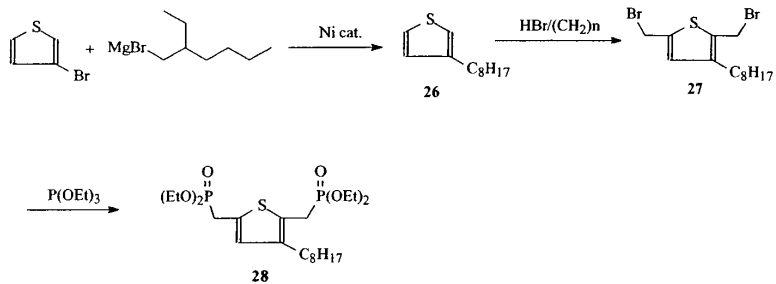
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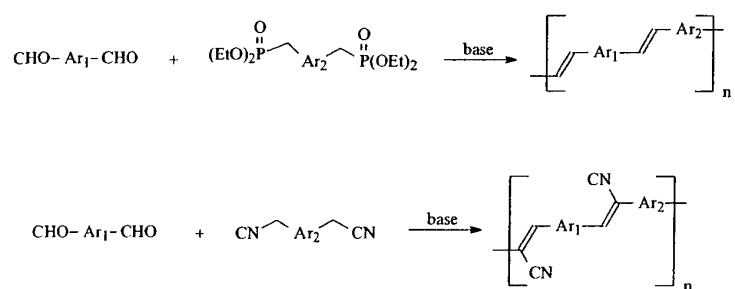
4



5



6



1: 2,6 - (2 -) (1)

2,6 - (100.0 g, 0.42) 2 - (165.0 g, 0.86) 1 ℓ DMF
 K_2CO_3 (120.0 g, 0.87) 가 . 90 가 .
 DMF , 500 Mℓ 가 . (3 x 400 Mℓ) , (1 x 200 Mℓ)
 , $MgSO_4$. 12
 5.21 g (65%) . 1H NMR($CDCl_3$) δ (ppm): 0.92 - 0.98(m, 12H, CH_3), 1.34 - 1.54(m, 16H), 1.75 - 1.81(m, 2H, $CH(CH_3)$), 4.02(d, J = 5.5 Hz, 4H, OCH_2), 7.19(d, J = 8.4 Hz, 2H), 7.70(s, 2H), 8.19(d, J = 8.5 Hz, 2H); ^{13}C NMR($CDCl_3$): 11.12, 14.06, 23.04, 23.88, 29.08, 30.51, 39.34, 71.34, 110.64, 120.84, 127.00, 129.62, 135.88, 164.29, 182.27. 49 51 ; FD - MS: m/z 464(M^+).

2: 4 - - 2 - t - (2)

1 ℓ 4 - (100.0 g, 0.53), (91.0 g, 1.34), t -
 (TBDMS - Cl)(96.5 g, 0.64) DMF 100 Mℓ 가 .
 3 , 3 $MgSO_4$.
 154.2 g (62%) . 1H NMR($CDCl_3$) δ (ppm): 0.07
 (s, 9H), 0.91(s, 6H), 4.65(s, 2H), 7.17(d, J = 8.3 Hz, 2H), 7.42(s, J = 8.3 Hz, 2H); ^{13}C NMR($CDCl_3$): 1.71, 21.93, 29.48, 67.89, 124.13, 131.27, 134.82, 144.02; FD - MS: m/z 301(M^+).

3: 2,6 - (2 -) - 9,10 - (4 -) (3)

2(67.2 g, 0.22) 300 Mℓ THF - 78 . - 60
 n - BuLi(2.5M, 86 Mℓ, 0.22) 가 . 가 , -
 78 1 1(30.0 g, 0.065) 200 Mℓ THF
 가 . TLC 가 HI (57%, 145
 g, 0.65) 가 TBDMS 10 가
 , 3 .
 , $MgSO_4$.
 20:80 :
 - 20.2 g (48%) . 1H NMR($CDCl_3$) δ (ppm): 0.82 - 0.89(m, 12H, CH_3), 1.26 - 1.43(m, 16H), 1.60 - 1.66(m, 2H), 1.85(s, br, 2H, OH), 3.72(d, J = 5.5 Hz, 2H, OCH_2), 4.89(s, 4H,), 6.84(d, J = 2.0 Hz, 2H), 7.00(dd, J₁ = 9.3 Hz, J₂ = 2.2 Hz, 2H), 7.47(d, J = 7.9 Hz, 4H,), 7.52(d, J = 9.7 Hz, 2H), 7.61(d, J = 7.8 Hz, 4H,); ^{13}C NMR($CDCl_3$): 11.17, 14.03, 23.00, 23.89, 29.08, 30.64, 39.16, 65.37, 70.17, 103.90, 127.07, 126.98, 127.13, 128.07, 129.56, 131.46, 134.74, 138.95, 139.85, 155.71. 110 112 ; FD - MS: m/z 646(M^+).

4: 2,6 - (2 -) - 9,10 - (4 -) (4)

3(4.40 g, 6.8) 25 Mℓ THF 0 . PBr_3 (1.3 Mℓ, 17)
 가 .
 $MgSO_4$. 15:85 CH_2Cl_2 :
 3.90 g (74%) . 1H NMR($CDCl_3$) δ (ppm): 0.8
 2 - 0.88(m, 12H, CH_3), 1.23 - 1.42(m, 16H), 1.61 - 1.69(m, 2H), 3.71(d, J = 5.7 Hz, OCH_2), 4.67(s, 4H,), 6.78(d, J = 2.4 Hz, 2H), 7.00(dd, J₁ = 9.5 Hz, J₂ = 2.4 Hz, 2H), 7.43(d, J = 8.0 Hz, 4H,), 7.49(d, J = 9.5 Hz, 2H), 7.62(d, J = 8.0 Hz, 4H,); ^{13}C NMR($CDCl_3$): 11.15, 14.06, 23.04, 23.88, 29.03, 30.62, 33.46, 39.06, 70.36, 103.83, 120.29, 126.81, 127.98, 129.27, 129.53, 131.68, 134.40, 136.91, 139.84, 155.80. 105 107 ; FD - MS: m/z 772(M^+).

5: 2,6 - (2 -) - 9,10 - (4 -) (5)

4(3.80 g, 4.9) (95 Mℓ, 29) 50 Mℓ 4
100 가 . 3.94 g
(90%) . $^1\text{H NMR}(\text{CDCl}_3)$ δ (ppm): 0.83 - 0.89(m, 12H, CH_3), 1.27 - 1.43(m, 28H), 1.59 - 1.66(m, 2H), 3.34(d, $J = 41.7$ Hz, 4H,), 3.71(d, $J = 5.3$ Hz, 4H, OCH_2), 4.08 - 4.18(m, $\text{P}(\text{O})\text{OCH}_2$, 8 H), 6.84(d, $J = 2.3$ Hz, 2H), 6.99(dd, $J_1 = 9.5$ Hz, $J_2 = 2.4$ Hz, 2H), 7.42(d, $J = 7.8$ Hz, 4H,), 7.48(d, $J = 9.5$ Hz, 2H), 7.55(dd, $J_1 = 8.0$ Hz, $J_2 = 2.2$ Hz, 4H,); $^{13}\text{C NMR}(\text{CDCl}_3)$: 11.21, 14.04, 16.46, 16.54, 23.01, 23.92, 29.14, 30.66, 32.89, 34.72, 39.37, 62.20, 62.29, 70.02, 103.95, 120.00, 127.00, 128.06, 129.56, 129.99, 130.08, 130.71, 130.83, 131.44, 131.47, 134.67, 138.12, 138.17, 155.76.
94 96 ; FD - MS: m/z 886(M^+).

6: 2,6 - (2 -) - 9,10 - (4 -) (6)

3(10.0 g, 0.015) 180 Mℓ (PCC)(8.0 g, 0.037) 가 . 100 Mℓ 1
HCl, MgSO_4 . 3
1:1 CH_2Cl_2 :
7.0 g(70%)
 $^1\text{H NMR}(\text{CDCl}_3)$ δ (ppm): 0.82 - 0.88(m, 12H, CH_3), 1.20 - 1.43(m, 16H), 1.60 - 1.68(m, 2H), 3.70(d, $J = 5.5$ Hz, OCH_2), 6.73(d, $J = 2.2$ Hz, 2H), 7.04(dd, $J_1 = 9.5$ Hz, $J_2 = 2.4$ Hz, 2H), 7.44(d, $J = 9.5$ Hz, 2H), 7.67(d, $J = 8.0$ Hz, 4H,), 8.15(d, $J = 8.0$ Hz, 4H,), 10.21(s, 2H,); $^{13}\text{C NMR}(\text{CDCl}_3)$: 11.13, 14.02, 22.97, 23.87, 29.07, 30.59, 39.12, 70.22, 103.37, 120.80, 127.59, 129.12, 130.00, 132.03, 134.01, 135.69, 146.38, 156.10, 192.00. 125 127 ; FD - MS: m/z 642(M^+).

7: 2,5 - () - 3,6 - (7)

(DMSS, 50 g, 0.22) (100 Mℓ)
2 100 가 , 가 . TLC (CH_2Cl_2 : , 1/1) DMSS 가 120 4
EtOH 가 .
가 EtOH 82 g() . $^1\text{H NMR}(\text{CDCl}_3)$ δ (ppm): 3.39(s, 4H), 3.65(s, 6H, COOCH_3), 7.09 - 7.38(m, 10H,), 10.62(s, 2H, NH); $^{13}\text{C NMR}(\text{CDCl}_3)$: 27.65, 50.84, 88.71, 124.63, 124.75, 129.12, 139.35, 156.74, 169.31. 236 238 ; FD - MS : m/z 378(M^+).

8: 2,5 - () (8)

7(80 g, 0.21) CH_2Cl_2 가 ,
TLC(CH_2Cl_2 : , 1/1) , CH_2Cl_2
EtOH . CH_2Cl_2 가 ,
EtOH 73 g (9
2%) . $^1\text{H NMR}(\text{CDCl}_3)$ δ (ppm): 3.83(s, 6H, COOCH_3), 7.00 - 7.34(m, 10H,), 8.00(s, 2H,), 8.56(s, br, 2H, NH); $^{13}\text{C NMR}(\text{CDCl}_3)$: 52.20, 118.58, 118.96, 119.71, 122.06, 129.38, 137.71, 141.88, 167.78; 164 166 ; FD - MS: m/z 376(M^+).

9: N,N,N',N' - 2,5 - (9)

8(40 g, 0.11), (200 Mℓ, 1.79), K₂CO₃ (20 g, 0.14) (1.4 g, 0.022)
 N₂ 185 24 가 . TLC(CH₂Cl₂: , 1/1)
 CH₂Cl₂ 가 CH₂Cl₂ ,
 EtOH 가 EtOH .
 45 g(80%) . ¹H NMR(CDCl₃) δ (ppm): 3.35(s, 6H, COOCH₃), 6.96 - 7.28(m, 2
 OH,), 8.44(s, 2H,); ¹³C NMR(CDCl₃): 51.94, 122.69, 123.00, 129.18, 131.00, 132.47, 142.1
 7, 147.32, 166.76; 249 251 ; FD - MS: m/z 528(M⁺).

10: 1,4 - - 2,5 - (N,N -) (10)

LiAlH₄ (6.4 g, 0.17) N₂ 가 THF(400 Mℓ)
 0 9(40 g, 0.076) 60 가 15
 가 45 . TLC(CH₂Cl₂: , 1/1) 0
 . 30 가 4
 Na₂SO₄
 34 g(95%) . AA8790 - 138. 4.36(s, 4H,), 7.00 - 7.50(m, 22H,
); 208 210 ; FD - MS: m/z 472(M⁺).

11: 2,5 - (N,N -) (11)

(PCC, 30 g, 0.064) CH₂Cl₂ (350 Mℓ) N₂ .
 10 가 , . TLC(CH₂Cl₂: , 1/1) 90
 .
 CH₂Cl₂ .
 (CH₂Cl₂: , 1/1) , 가
 가 21.5 g(7
 2%) . ¹H NMR(CDCl₃) δ (ppm): 7.01 - 7.06(m, 12H), 7.24 - 7.29(m, 8H), 7.61(s, 2H), 10.
 13(s, 2H); ¹³C NMR(CDCl₃): 123.13, 123.53, 129.10, 129.80, 136.49, 146.49, 148.34, 189.51; 260
 262 ; FD - MS: m/z 468(M⁺).

12: 1,5 - () (12)

500 Mℓ 1,5 - (15.0 g, 0.094), (27.2 g, 0.2), n -
 (32.5 g, 0.2) 200 Mℓ DMF 가 90 가 ,
 700 Mℓ .
 25.2 g(80%) . ¹H NMR(CDCl₃) δ (ppm): 0.92(t, J = 6.5 Hz, 6H),
 1.35 - 1.41(m, 8H), 1.52 - 1.57(m, 4H), 1.85 - 1.92(m, 4H), 4.10(t, J = 6.4 Hz, 4H), 6.81(d, J = 7.6 Hz, 2
 H), 7.30 - 7.36(m, 2H), 7.84(d, J = 8.3 Hz); 92 93 .

13: 1,5 - () - 4,8 - () (13)

12(10.0 g, 0.030) (1.92 g, 0.064) 10 Mℓ
 HBr(33%, 12.3 Mℓ, 0.064) . 50 5 가
 .
 14.7 g(94%) . ¹H NMR(CDCl₃) δ (ppm): 0.92(t, J = 6.5 Hz, 6H), 1.36
 - 1.41(m, 8H), 1.51 - 1.57(m, 4H), 1.99 - 2.09(m, 4H), 4.13(t, J = 6.4 Hz, 4H), 5.31(s, 4H), 6.84(d, J =
 8.2 Hz, 2H), 7.37(d, J = 8.2 Hz, 2H); 105 107 .

14: 4,8 - - 1,5 - () (14)

50 Mℓ 13(9.0 g, 0.017) (7.5 Mℓ, 0.044) 가 .
4 100 가 10:90 :

6.5 g(59%) . $^1\text{H NMR}(\text{CDCl}_3)$ δ (ppm): 0.92(t, J = 6.8 Hz), 1.08(t, J = 7.1 Hz), 1.36 - 1.41(m, 8H), 1.47 - 1.54(m, 4H), 1.95 - 2.05(m, 4H), 3.75 - 3.91(m, 8H), 4.06 - 4.14(d t , 8H, OCH₂), 4.14(s, 4H), 6.80(d, J = 8.2 Hz, 2H), 7.23 - 7.27(m, 2H); $^{13}\text{C NMR}(\text{CDCl}_3)$: 13.94, 16.23, 16.31, 22.52, 25.94, 28.84, 31.60, 33.92, 35.76, 61.34, 61.43, 68.84, 106.28, 106.29, 119.77, 119.92, 130.14, 130.24, 156.04. 80 82 ; FD - MS: m/z 628(M⁺).

15: 2,6 - () (15)

2,6 - (30.0 g, 0.19) 90 400 Mℓ DMF (81.6 g, 0.59)
n - (97.5 g, 0.59) 700 Mℓ , 41.3 g(67%)
. $^1\text{H NMR}(\text{CDCl}_3)$ δ (ppm): 0.91(t, J = 6.9 Hz, 6H), 1.32 - 1.40(m, 8H), 1.44 - 1.54(m, 4H), 1.77 - 2.86(m, 4H), 4.02(t, J = 6.6 Hz, 4H), 7.06 - 7.12(m, 4H), 7.60(d, J = 8.8 Hz, 2H); 78 79 .

16: 1,5 - () - 2,6 - () (16)

15(9.0 g, 0.030) (1.87 g, 0.062) 40 Mℓ
HBr(30%, 12.4 Mℓ, 0.062) 50 5 가 .
9.0 g(58%) . $^1\text{H NMR}(\text{CDCl}_3)$ δ (ppm): 0.93(t, J = 6.9 Hz, 6H), 1.37 - 1.42(m, 8H), 1.51 - 1.61(m, 4H), 1.84 - 1.93(m, 4H), 4.18(t, J = 6.4 Hz, 4H), 5.07(s, 4H), 7.35(d, J = 9.3 Hz, 2H), 8.03(d, J = 9.3 Hz, 2H); 110 112 .

17: 2,6 - () - 1,5 - () (17)

50 Mℓ 16(8.0 g, 0.16) (13 Mℓ, 0.078) 가 .
4 100 가 10:90 :
5.0 g(51%) . $^1\text{H NMR}(\text{CDCl}_3)$ δ (ppm): 0.92(t, J = 7.0 Hz, 6H), 1.15(t, J = 7.0 Hz, 12H), 1.34 - 1.53(m, 12H), 1.79 - 1.89(m, 4H), 3.71(d, J = 22.0 Hz, 2H), 3.91 - 3.96(m, 8H), 4.10(t, J = 6.6 Hz, 4H), 7.28(d, J = 9.5 Hz, 2H), 8.02(d, J = 9.5 Hz, 2H); $^{13}\text{C NMR}(\text{CDCl}_3)$: 13.99, 16.25, 16.33, 22.60, 25.78, 29.68, 31.64, 61.75, 61.84, 69.41, 113.73, 113.88, 114.66, 114.70, 125.12, 125.20, 128.78, 152.81. 101 102 ; FD - MS: m/z 628(M⁺).

18: 2,6 - - 1,5 - () (18)

1,5 - (20.0 g, 0.125) 400 Mℓ 0 .
(40.1 g, 0.250) 가 가 1 .
2,6 - - 1,5 - 36.1 g(90%)
(36.0 g, 0.114) (13.0 g, 0.24), 320 Mℓ
(50.0 g, 0.24) .

25.5 g(60%) . $^1\text{H NMR}(\text{CDCl}_3)$ δ (ppm): 0.93(t, J = 6.8 Hz, 6H), 1.36 - 1.41(m, 8H), 1.55 - 1.60(m, 4H), 1.88 - 1.98(m, 4H), 4.06(t, J = 6.6 Hz, 4H), 7.58(d, J = 9.0 Hz, 2H), 7.73(J = 9.0 Hz, 2H); $^{13}\text{C NMR}(\text{CDCl}_3)$: 14.03, 22.61, 25.69, 30.23, 31.69, 74.62, 113.73, 119.31, 130.11, 131.03, 148.04, 152.86. 41 43 ; FD - MS: m/z 486(M⁺).

19: 1,6 - () - 2,6 - (19)

18(13.0 g, 0.027) 110 Mℓ THF - 78
 nBuLi (2.5M, 32 Mℓ, 0.080) 가 - 60
 가 - 78 1 DMF(17 Mℓ, 0.21) 가
 (3 x 100 Mℓ)
 MgSO₄ 6.72 g
 (65%) . ¹H NMR(CDCl₃) δ (ppm): 0.93(t, J = 6.7 Hz, 6H, CH₃), 1.37 - 1.42(m, 8H,), 1.55 - 1.60(m, 4H,), 1.95 - 2.00(m, 4H,), 4.15(t, J = 6.7 Hz, 4H, OCH₂), 7.92(d, J = 8.8 Hz, 2H,), 7.89(d, J = 8.8 Hz, 2H,), 10.60(s, 2H, CHO); ¹³C NMR(CDCl₃): 14.01, 22.59, 25.65, 30.25, 31.63, 79.50, 119.53, 123.69, 127.51, 133.19, 161.56, 189.51. 50 52 ; FD - MS: m/z 384(M⁺).

20: 1,5 - () - 2,6 - () (20)

0 30 Mℓ 20 Mℓ (1.90 g, 50) 가
 10 , 10 Mℓ 19(3.25 g, 8.4)
 가 가 30 Mℓ 1M KOH 30
 3 MgSO₄
 (2.91 g(88%)) . ¹H NMR(CDCl₃) δ (ppm): 0.93(t, J = 6.8 Hz, 6H, CH₃), 1.37 - 1.42(m, 8H,), 1.51 - 1.58(m, 4H,), 1.87 - 1.97(m, 4H,), 2.19(s, br, 2H, OH), 4.00(t, J = 6.7 Hz, 4H, OCH₂), 4.88(s, 4H,), 7.50(d, J = 8.6 Hz, 2H,), 7.84(d, J = 8.6 Hz, 2H,).

21: 2,6 - () - 1,5 - () (21)

20(2.90 g, 7.5) 15 Mℓ THF 0 5 Mℓ THF
 F PBr₃ (1.7 Mℓ, 18) 가
 5.95 :
 2.61 g(68%) . ¹H NMR(CDCl₃) δ (ppm): 0.94(t, J = 6.8 Hz, 6H, CH₃), 1.39 - 1.44(m, 8H,), 1.55 - 1.62(m, 4H,), 1.92 - 2.01(m, 4H,), 4.10(t, J = 6.6 Hz, 4H, OCH₂), 4.73(s, , 4H), 7.49(d, J = 8.7 Hz, 2H,), 7.84(d, J = 8.7 Hz, 2H,). 58 60 .

22: 1,5 - () - 2,6 - () (22)

21(2.50 g, 4.9) (2 Mℓ, 12) 100 4
 가 20:80 :
 2.34 g(76%) . ¹H NMR(CDCl₃) δ (ppm): 0.94(t, J = 6.8 Hz, 6H, CH₃), 1.26(t, J = 7.1 Hz, 12H, CH₃), 1.38 - 1.43(m, 8H,), 1.53 - 1.63(m, 4H,), 1.88 - 1.98(m, 4H,), 3.39(d, J = 21.7 Hz, 4H, OCH₂), 3.99 - 4.12(m, 8H, POCH₂), 7.55(d, J = 8.8 Hz, 2H,), 7.79(d, J = 8.8 Hz, 2H,); ¹³C NMR(CDCl₃): 13.98, 16.28, 16.35, 22.59, 25.77, 26.14, 27.99, 30.40, 31.72, 61.97, 62.06, 75.09, 118.14, 120.62, 120.72, 128.30, 129.12, 153.51, 153.53, 153.64; 48 50 ; FD - MS: m/z 628(M⁺).

23: 9,9' - (23)

(23.0 g, 0.14) 200 Mℓ THF - 78 n - BuLi(2.5M, 65 Mℓ, 0.16) 가 , 1 . 20 Mℓ THF n - BuLi(- (27.4 g, 0.17) 가 2 n - BuLi(2.5M, 65 Mℓ, 0.16) 가 1 , n - (27.4 g, 0.17) 가 , 42.3 g(93%) MgSO₄ . ¹H NMR(CDCl₃) δ (ppm): 0.57 - 0.66(m, 4H), 0.75(t, J = 6.7 Hz, 6 H), 0.86 - 0.90(m, 4H), 1.02 - 1.11(m, 8H), 1.91 - 1.97(m, 4H), 7.28 - 7.34(m, 6H), 7.67 - 7.69(m, 2H); ¹³ C NMR(CDCl₃): 13.97, 22.57, 23.74, 29.73, 31.50, 40.42, 55.02, 119.62, 122.83, 126.67, 126.96, 141.13, 150.69.

24: 2,7 - () - 9,9' - () (24)

23(15.0 g, 0.045) (13.5 g, 0.45) 30% HBr 90 Mℓ 70 200 Mℓ 11.2 g ¹H NMR(CDCl₃) δ (ppm): 0.58 - 0.65(m, 4H), 0.75(t, J = 6.7 Hz, 6H), 1.03 - 1.11(m, 12H), 1.92 - 1.98(m, 4H), 4.57(s, 4H), 7.32 - 7.35(m, 4H), 7.61(d, J = 7.7 Hz, 2H); ¹³ C NMR(CDCl₃): 13.96, 22.45, 23.65, 29.51, 31.34, 34.32, 40.07, 55.14, 120.02, 123.66, 127.98, 136.91, 140.74, 151.66.

25: 2,7 - () - 9,9' - () (25)

24(6.85 g, 0.013) 50 Mℓ (4.55 g, 0.033) , (3.0 Mℓ, 0.033) 0.15 g - 18 - 6 가 10:90 : 2.8 g(51%) ¹ H NMR(CDCl₃) δ (ppm): 0.58 - 0.65(m, 4H), 0.75(t, J = 6.7 Hz, 6H), 1.05 - 1.15(m, 12H), 1.93 - 1.99(m, 4H), 3.84(s, 4H), 7.28 - 7.32(m, 4H), 7.68(d, J = 7.7 Hz, 2H); ¹³ C NMR(CDCl₃): 13.96, 22.54, 23.73, 23.91, 29.58, 31.46, 40.23, 55.46, 120.43, 122.42, 126.81, 128.93, 140.32, 151.97; 70 72 ; FD - MS: m/z 412(M⁺).

26: 3 - (2 -) (26)

(10.2 g, 0.42) 40 Mℓ THF 3 가 (Grinard) , 100 Mℓ THF 2 - (79.0 g, 0.41) 가 가 , 1 가 100 Mℓ THF 3 - (50.0 g, 0.31) , [1,3 - ()] (1.7 g, 0.003) 100 Mℓ THF 가 , 2N HCl , MgSO₄ 27.5 g (46%) ¹H NMR(CDCl₃) δ (ppm): 0.84 - 0.89(m, 6H), 1.19 - 1.33(m, 8H), 1.53 - 1.57(m, 1H), 2.56(d, J = 6.8 Hz, 2H), 6.87 - 6.90(m, 2H), 7.19 - 7.23(m, 2H); ¹³ C NMR(CDCl₃): 10.86, 14.12, 23.05, 25.70, 28.95, 32.58, 34.40, 40.46, 120.64, 124.79, 128.80, 141.93; FD - MS: m/z 196(M⁺).

27: 2,5 - () - 3 - (2 -) (27)

26(7.0 g, 0.036) (2.57 g, 0.086) 3 Mℓ HBr (2
 30%, 0.088 , 18 Mℓ) .
 00 Mℓ , NaHCO₃ , 9.6 g
 (70%), 가 . ¹H NMR(
 CDCl₃) δ (ppm): 0.84 - 0.91(m, 6H), 1.19 - 1.33(m, 8H), 1.53 - 1.61(m, 1H), 2.45(d, J = 7.2 Hz, 2H), 4.63
 (s, 4H), 6.81(s, 1H); ¹³C NMR(CDCl₃): 10.89, 14.09, 23.01, 25.33, 25.89, 26.66, 28.90, 32.73, 40.25, 13
 0.49, 135.51, 140.00, 141.96; FD - MS: m/z 380(M).

28: 2,5 - () - 3 - (2 -) (28)

27(9.6 g, 0.025) (10.8 Mℓ, 0.063) 100 Mℓ 4
 100 가 . 25:75 :
 9.0 g (72%) . ¹H NMR(CDCl₃) δ (ppm): 0.82 - 0.89(m, 6H), 1.
 25 - 1.31(m, 20H), 1.47 - 1.55(m, 1H), 2.42(d, J = 7.1 Hz, 2H), 3.19 - 3.29(m, 4H), 4.01 - 4.11(m, 8H), 6.
 70(s, 1H); ¹³C NMR(CDCl₃): 10.90, 14.10, 16.38, 16.45, 16.46, 23.08, 25.70, 28.98, 32.66, 32.69, 32.70,
 40.48, 125.63, 129.37, 129.47, 139.91; FD - MS: m/z 496(M⁺).

29: -

THF . 2.5
 NaH 가 . 가
 2 . 45 .

30:

1:1 THF t -
 . t - 가 .
 45 . 2 .

EL

31

EL . EL

(a) - - (ITO) , ,

(b) (30 mL 30 mg) 2 μm (Teflon) 500 700 ,

(c) 10:1 Mg Ag 2000 .

EL . ,

1 T_g T_d (PL) , EL
ITO/ /Mg:Ag EL 31 4 5
22 17 , PL EL 22 EL - 6

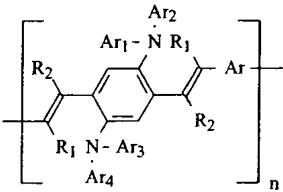
[1]

	M _w ^a	T _g ()	T _d ()	(λ _{max} nm) ^b	(λ _{max} nm) ^b	EL (λ _{max} nm)
4	32000	121	412	509	555	556
1	67200	225	448	362	562	ND ^c
5	34700	237	454	403	521	ND
30	2580	210	420	421	577	ND
18	204000	175	390	430	530	572
22	31100	149	395	404	664	668
34	5710	120	388	515	591	620
14	2740	105	290	408	506	572
9	36300	123	351	449	543	ND
17	2180	79	329	421	527	572
^a ^b ^c						

1 EL 1
EL

(57)

1.
; ; , 1
:
1



R₁ R₂ ; 1 24 ; 6 40
; 4 40 ;

Ar_1, Ar_2, Ar_3, Ar_4 Ar 6 40 ; 4 40 ;

2.

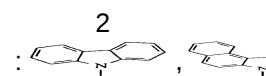
1 ,

Ar_1 Ar_2 가 1 , Ar_3 Ar_4 가 2 .

3.

1 ,

Ar_1 Ar_2 가 1 , Ar_3 Ar_4 가 2 .



4.

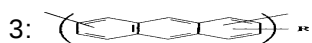
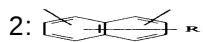
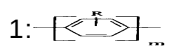
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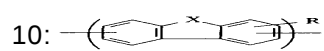
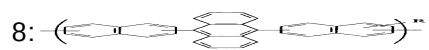
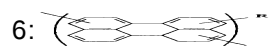
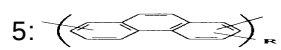
Ar Ar .

5.

1 ,

Ar 1 24 , R ; 1 24 ; 6 28 ; 4 40 ; m 1 3 :

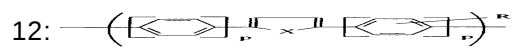




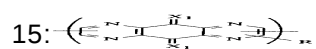
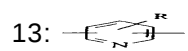
, X O S ;



, p 0 2 ;



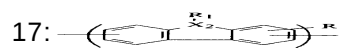
, X O S , p 0 2 ;



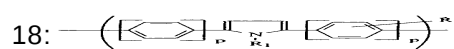
, X_1 0 2 ;



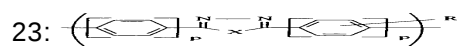
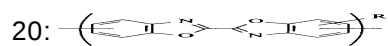
, R_1 ; 4 40 ; 1 24 ; 6 28 ;



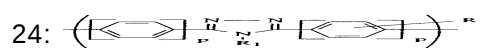
, R_1 , X_2 ;



, R_1 , p 0 2 ;



, X 0 S , p 0 2 ;

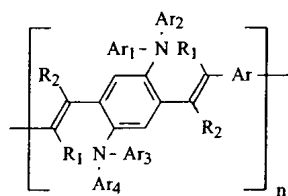


, R_1 , p 0 2 .

6.

； ；
1 ；

1



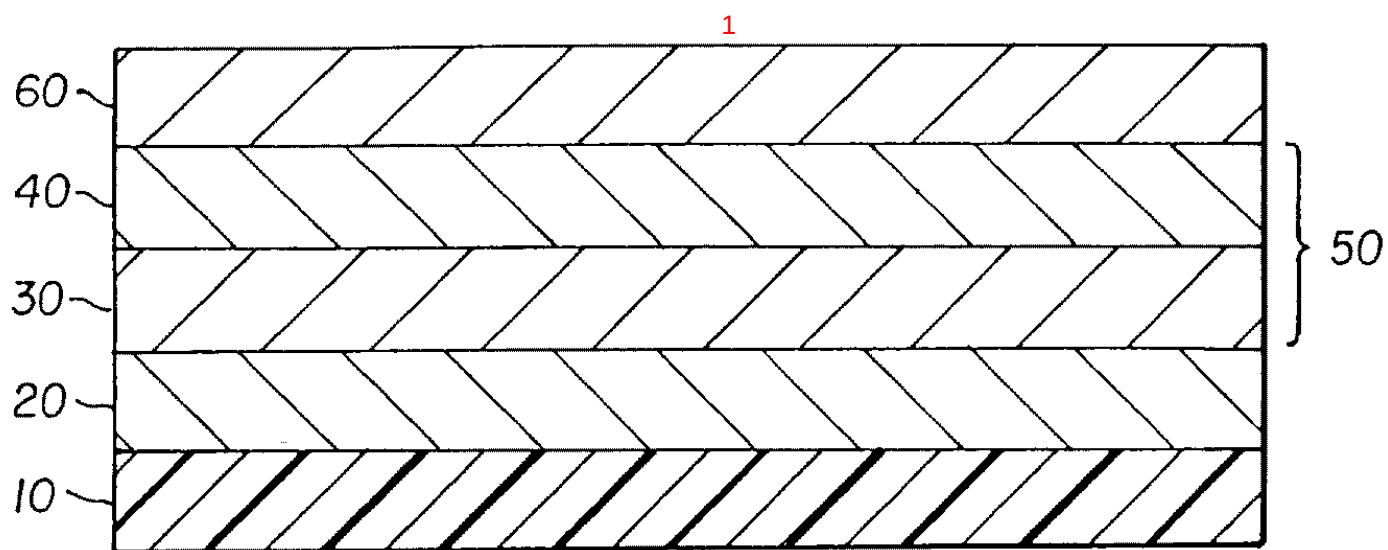
R_1 R_2 ； 1 24
； 4 40

； 6 40
；

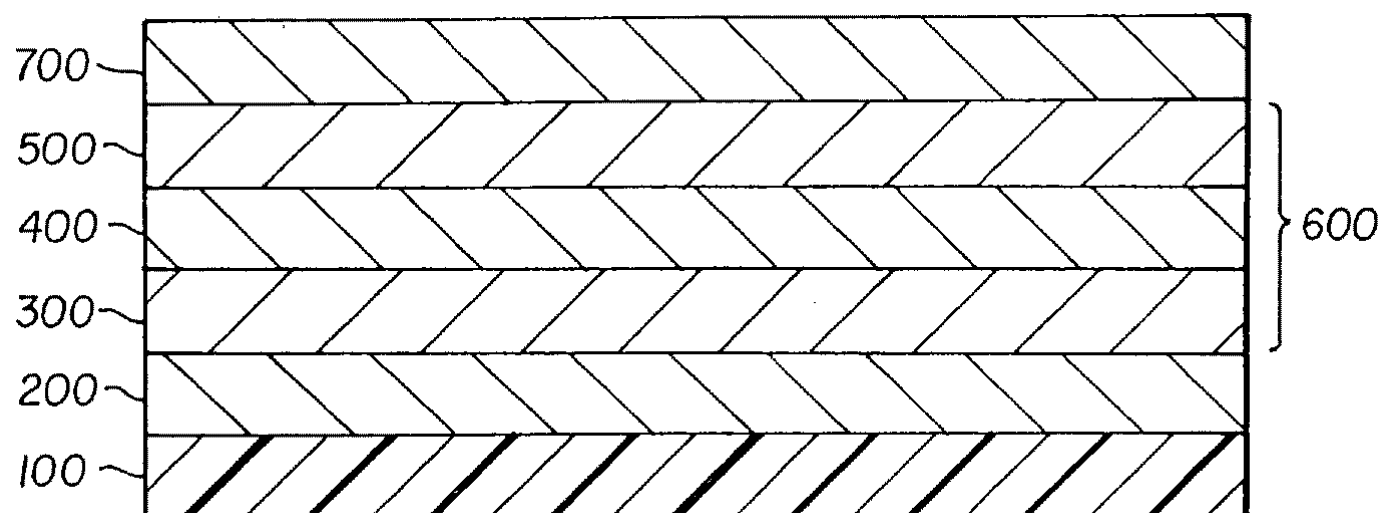
$\text{Ar}_1, \text{Ar}_2, \text{Ar}_3, \text{Ar}_4$ Ar

6 40
；

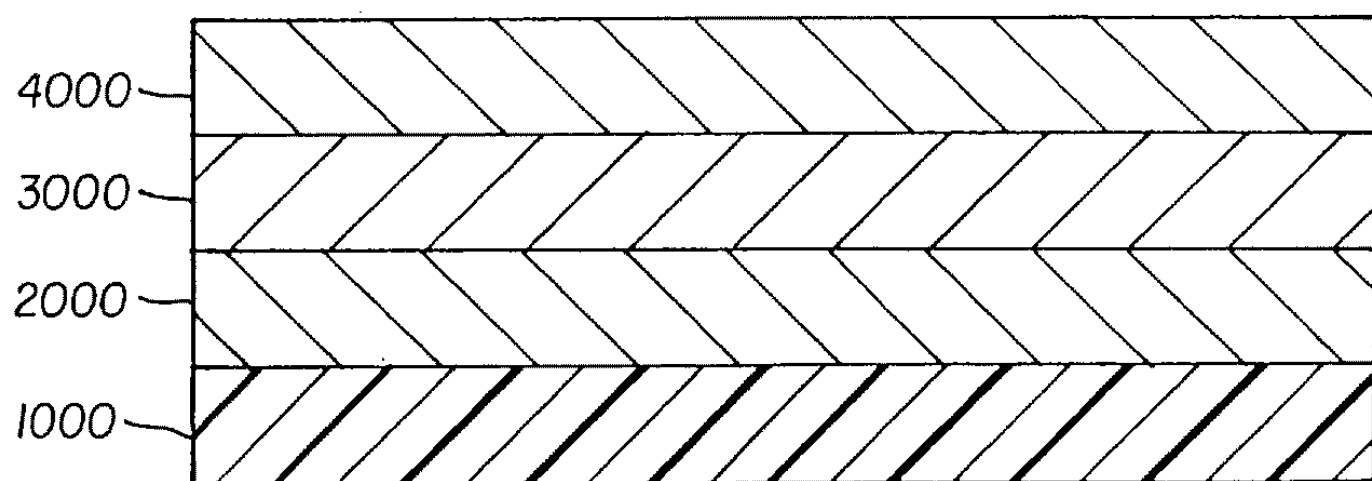
； 4 40



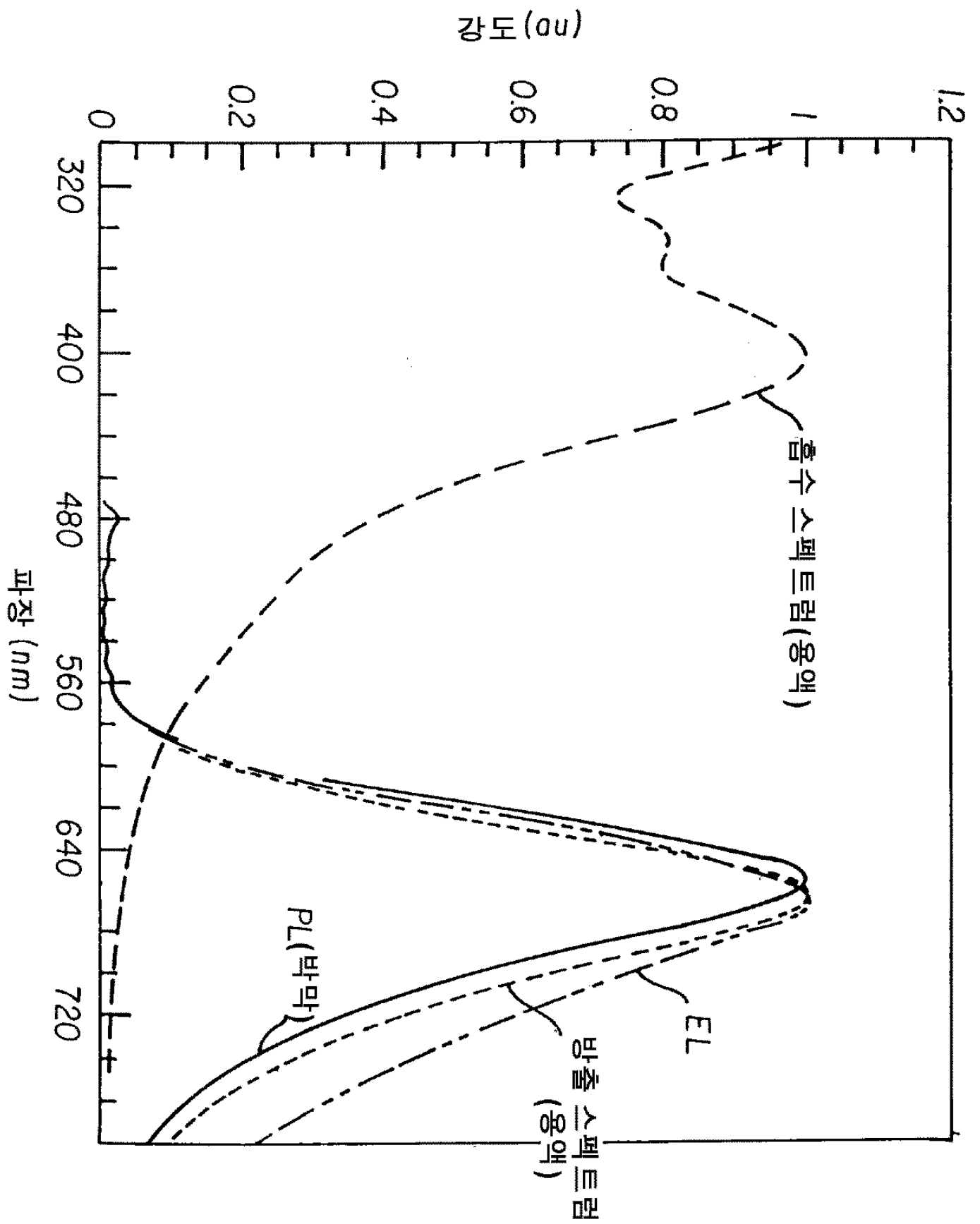
2



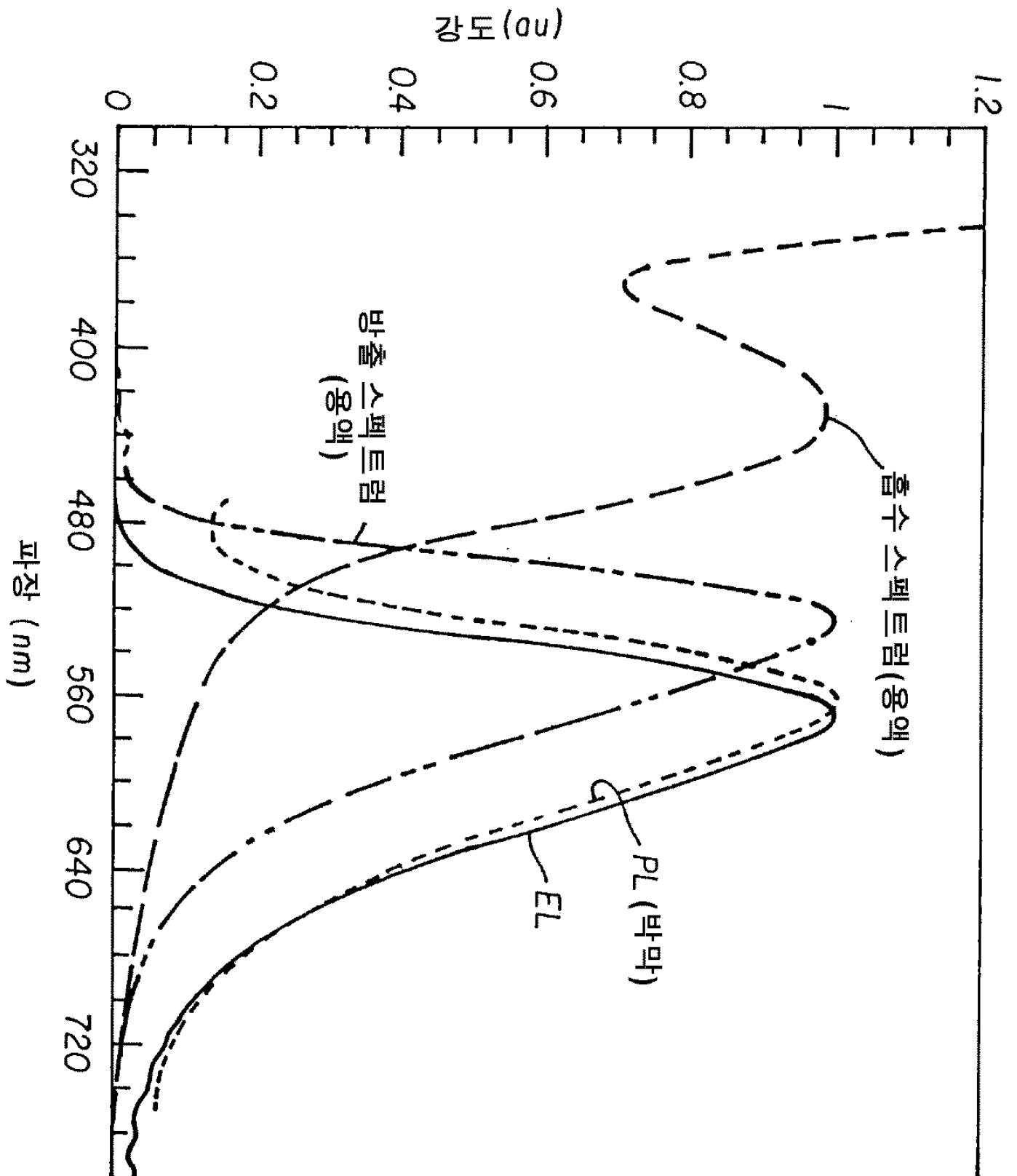
3



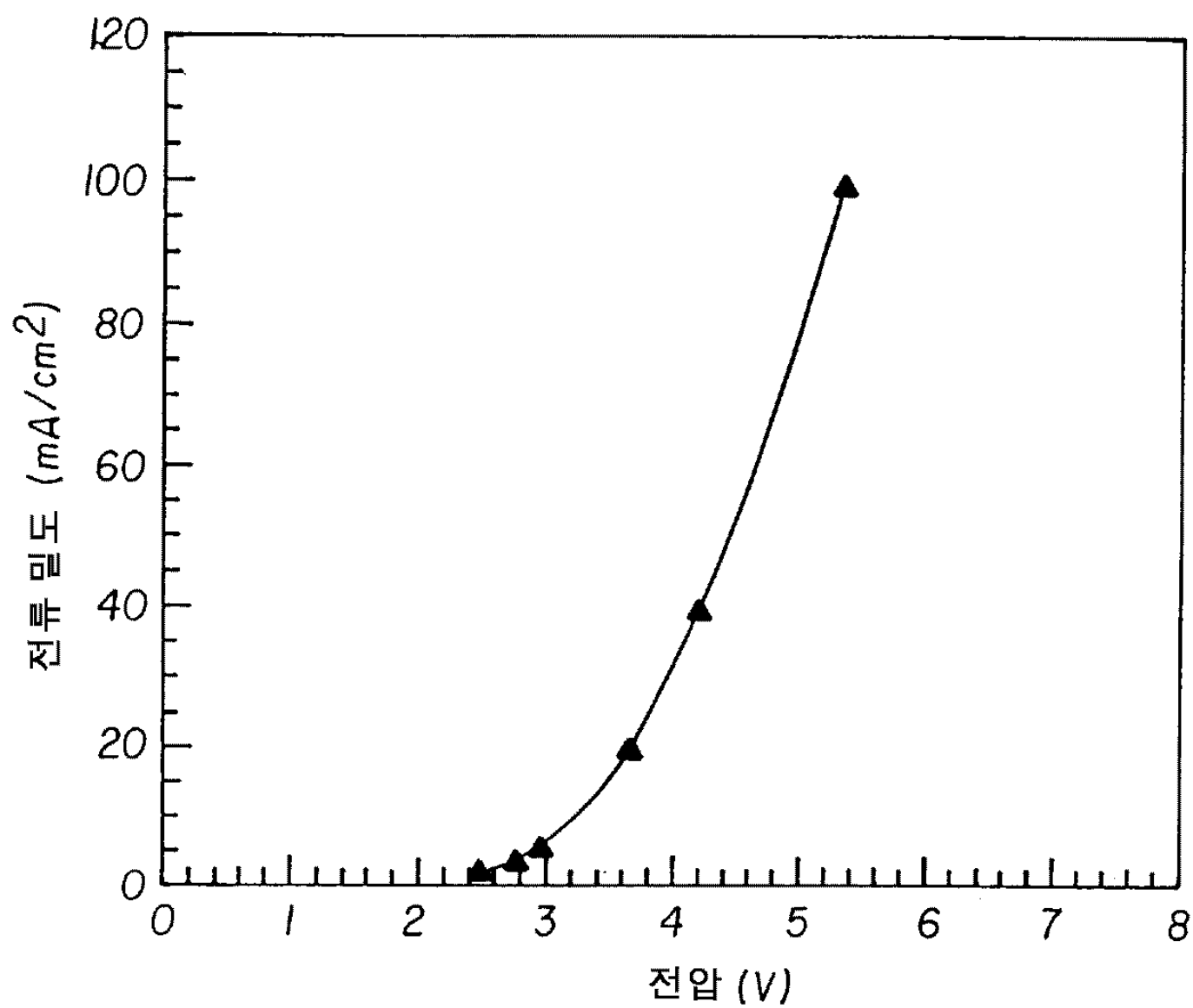
4



5



6



专利名称(译)	具有芳胺聚合物的电致发光器件		
公开(公告)号	KR1020010112635A	公开(公告)日	2001-12-20
申请号	KR1020010032909	申请日	2001-06-12
[标]申请(专利权)人(译)	伊斯曼柯达公司		
申请(专利权)人(译)	柯达公司针		
当前申请(专利权)人(译)	柯达公司针		
[标]发明人	SHI JIANMIN 쉬지안민 ZHENG SHIYING 정쉬잉		
发明人	쉬지안민 정쉬잉		
IPC分类号	H01L51/50 C08G61/02 C09K11/06 H01B1/12 H01L51/00 H01L51/30		
CPC分类号	C09K11/06 H01B1/12 H01L51/0035 H01L51/0038 H01L51/0043 H01L51/0052 H01L51/0059 Y10S428/917		
代理人(译)	KIM, CHANG SE 张居正, KU SEONG		
优先权	09/593127 2000-06-13 US		
其他公开文献	KR100802756B1		
外部链接	Espacenet		

摘要(译)

一种电致发光器件，其包括阳极，阴极以及设置在所述阳极和阴极之间的聚合物发光材料，所述具有芳胺部分的聚合物发光材料具有分子式：
其中：R1和R2独立地是氢，1至24个碳原子的烷基，或6至40个碳原子的芳基或取代的芳基，或4至40个碳原子的杂芳基或取代的杂芳基或氰基；Ar 1，Ar 2，Ar 3，Ar 4和Ar分别是6至40个碳原子的芳基或取代的芳基；或4至40个碳的杂芳基或取代的杂芳基，或其组合。

