

(19)
(12)

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(51) 。 Int. Cl. 7
C09K 11/06

(11)
(43)

2003 - 0019141
2003 03 06

(21) 10 - 2002 - 0050811
(22) 2002 08 27

(30) 09/941,009 2001 08 28 (US)

(71) 343

(72) 14580 821

14580 34

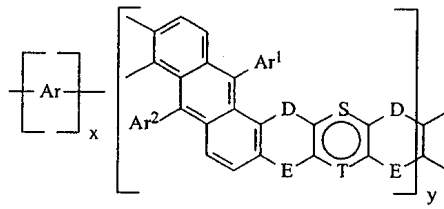
14610 42

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¹H NMR

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¹³C NMR

(ladder)

(EL)

(LED)

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LED

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(casting)

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[Burroughes, J.H. Nature 1990, 347, 539 - 41] (p -) (PPV) 가
 . EL (balancing) (Burroughes) EL
 (PF) (Ohmori, Y.) [Jpn. J. Appl.
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 2, 4, 36] () [Solid State Commun. 1991, 80, 605]

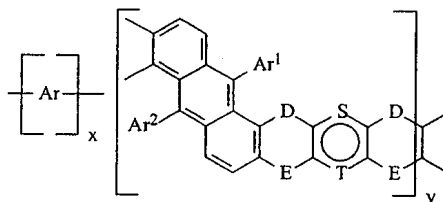
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 (Huber) [Acta Polymer, 1994, 45, 244] (intrachain) (

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$0 < x < 1, 0 < y < 1 \quad x + y = 1$;

S, T, R, 1, 24, 6, 28, N-R, N-R(C, N, 4)

D, E, R, E, 가, R-C-R

Ar¹, Ar², Ar, 6, 40, ;

Ar¹, Ar², Ar, 4, 40, .

Ar, Ar, -

1, (rigid chromophore), 가, Ar

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1) 가 ;

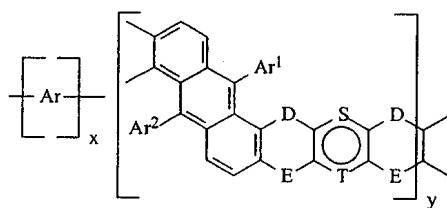
2) - ;

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0 < x < 1, 0 < y < 1, x + y = 1 ;

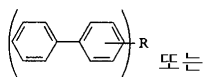
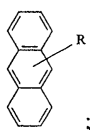
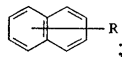
S, T, R, 1, 24, 6, 28, N-R, N-R(C, N, 4)

D E , D E 가 R - C - R
 (, C R) ;

Ar¹, Ar² Ar 6 40 ;

Ar¹, Ar² Ar 4 40 .

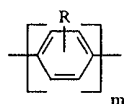
, Ar¹ Ar² .



R .

Ar 1 25 :

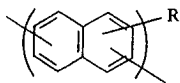
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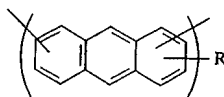
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m 1 3 .

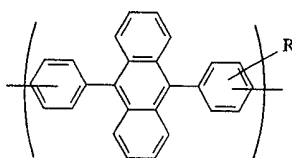
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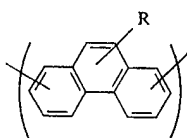
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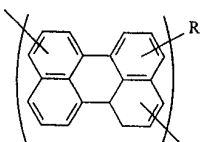
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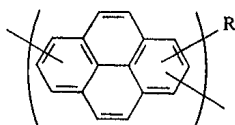
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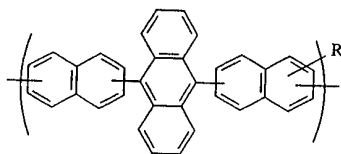
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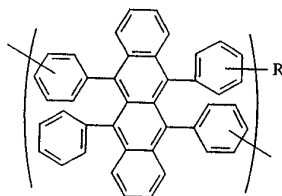
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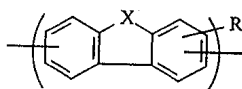
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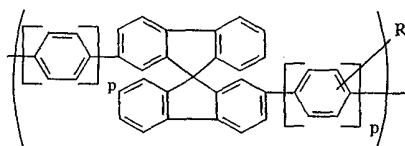


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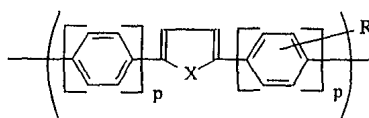
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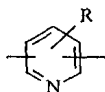


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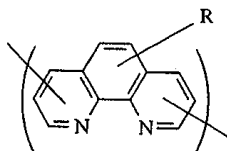
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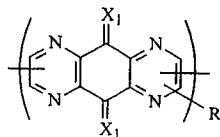
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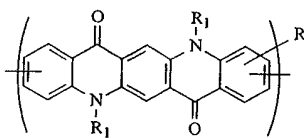


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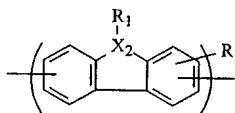
X₁ 0 2

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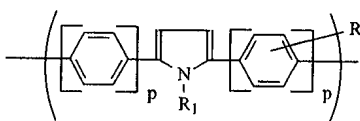


R¹ 40 , , 1 24 , 6 28 , 4

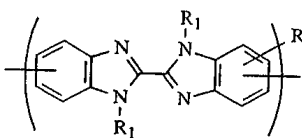
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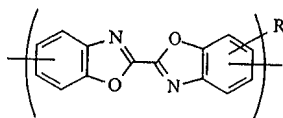
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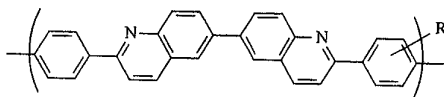
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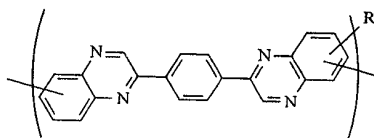
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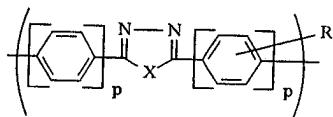
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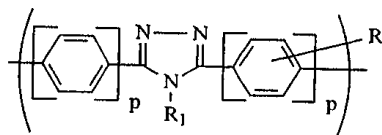
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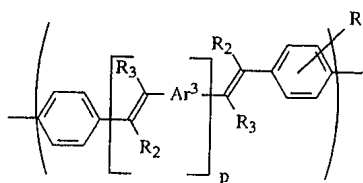
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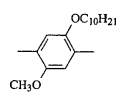
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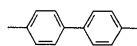
Ar³ Ar ,
 R₂ R₃ 4 40 , 1 24 , 6 28 , R₂ R₃ ,
 Ar .



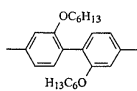
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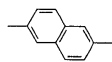
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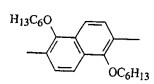
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Ar-4



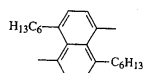
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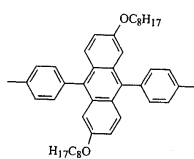
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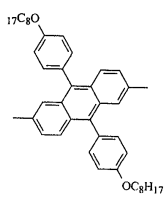
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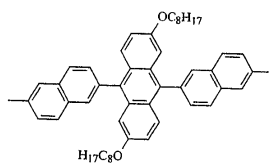
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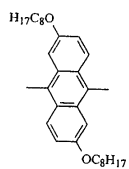
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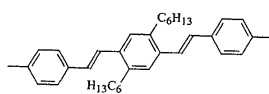
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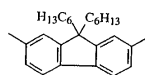
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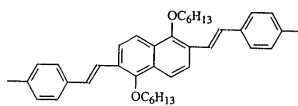
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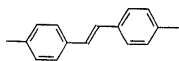
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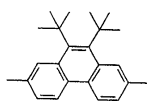
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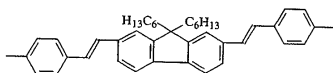
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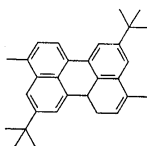
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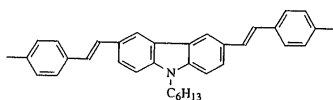
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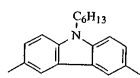
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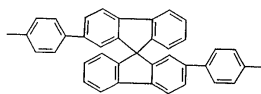
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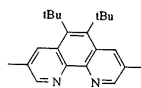
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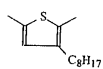
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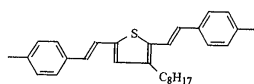
Ar-22



Ar-23



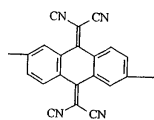
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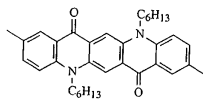
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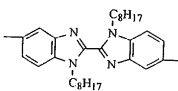
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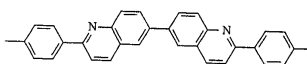
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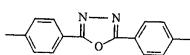
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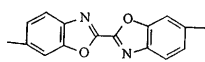
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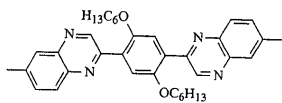
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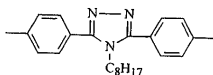
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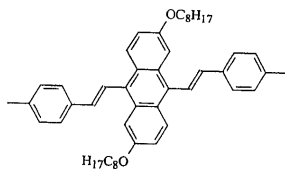
Ar-32



Ar-33



Ar-34

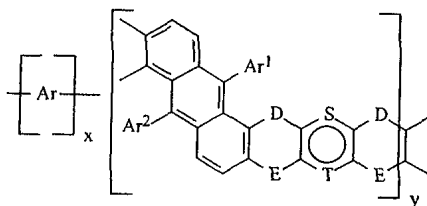


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Ar-35

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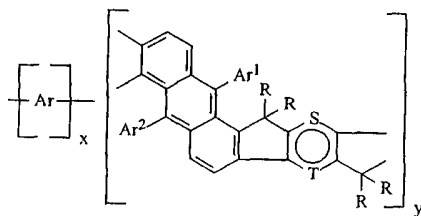


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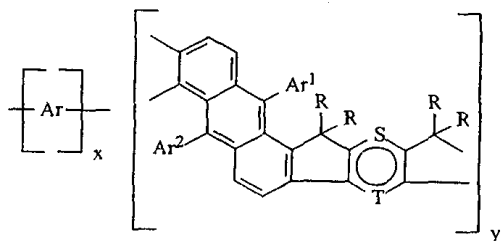
1, D E 가
R-C-R(, C R

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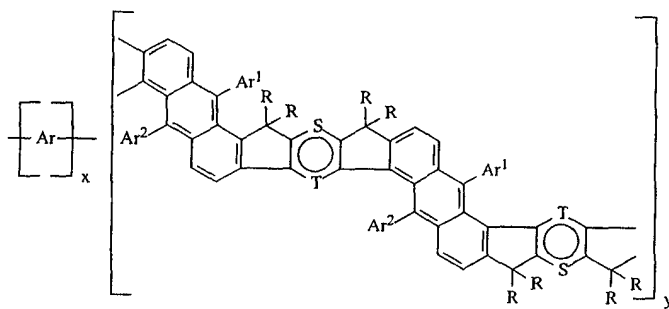
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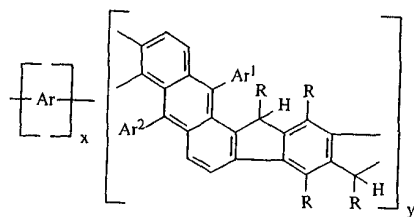


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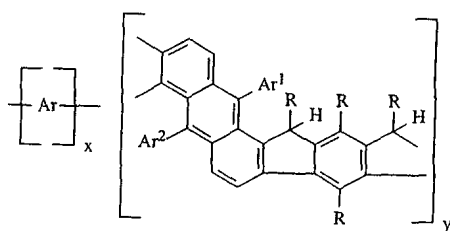


CH-R , 1 S T C-R ; D E 가
5 10

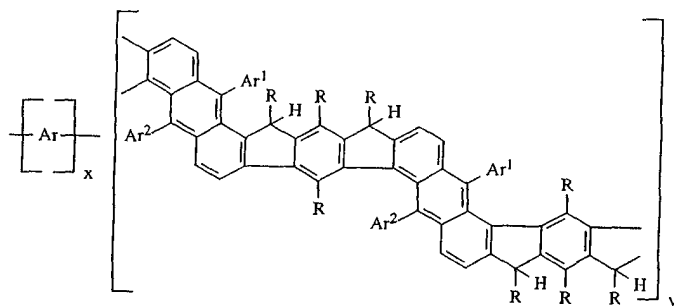
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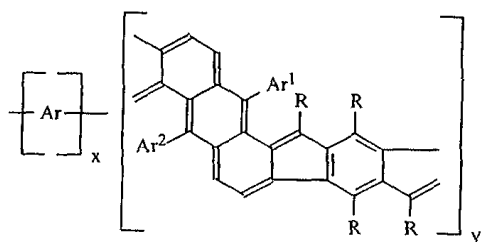
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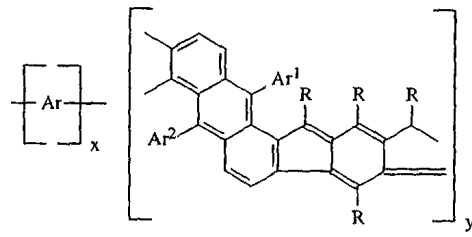
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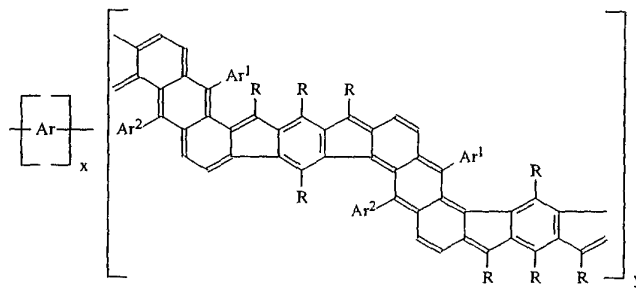
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9



10

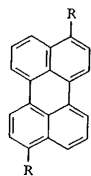


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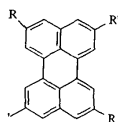
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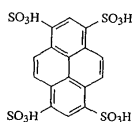


FD 1 R=H

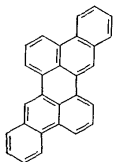
FD 2 R=CO₂Pr-i

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

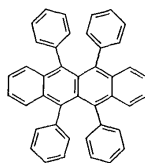
FD 4 R=R'=t-Bu



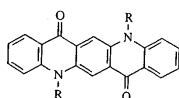
FD 5



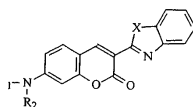
FD 6



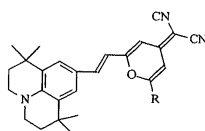
FD 7



- FD 8 R=H
- FD 9 R=Me
- FD 10 R=Pr-i
- FD 11 R=2-에틸헥실



- FD 12 R₁=R₂=Me, X=O
- FD 13 R₁=R₂=헥실, X=O
- FD 14 R₁=R₂=페닐, X=C
- FD 15 R₁=R₂=Me, X=S
- FD 16 R₁=R₂=헥실, X=S
- FD 17 R₁=R₂=페닐, X=S



- FD 18 R=n-헥실
- FD 19 R=페닐

EL 가 , 가 - EL

Pd - (Suzuki) [Synthetic
Comm. 1981, 11(7), 513]. EL (Inbasekaran)
(5,777,070).
(Scherf) [Makromol. Chem. Rapid Commun. 1991, 12, 489]
1 3

1 EL (30) (40)
 2 (40) EL (5)
 0) (20) (30) (60) (40)
 (10) 1

2 EL 2 EL (300) (400)
 (500) (600) (200) (700)
 (100) 2

2 EL 가 2 , a) 4,356,42
 9 EL ; b) 5,776,622
 ; c) 09/191,705 -
 ; d) 4,769,292
 (emitter)

3 EL (2000) (4000) (3000) (3000)
 (1000) 3

EL ; FD,
 ; EL ;
 - EL

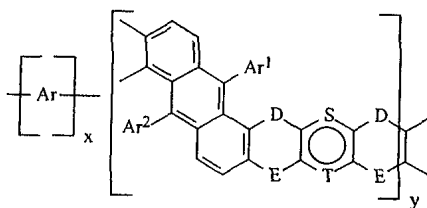
(3000) 가

(Groenendaal, L.) (3,4 -)(PEDOT) 09/191,705
 [Adv. Mater. 2000, 12, 481]. EL
 5,429,884 ((Namiki)) 5,7
 76,622 Mg, Li

가

가 1 가

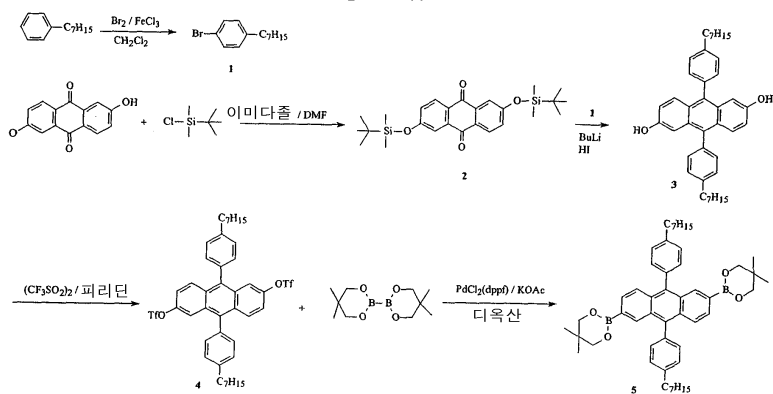
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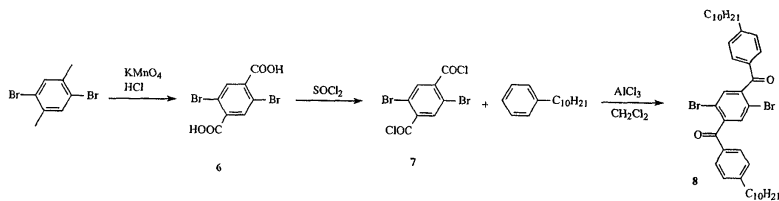
1 3

1

단량체의 합성

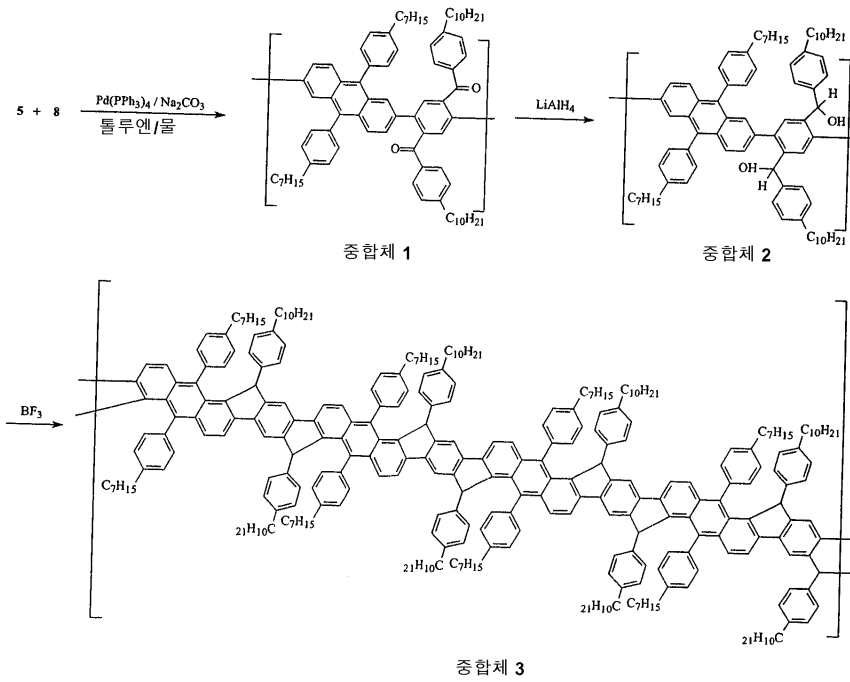


2



3

중합체의 합성



1: 1 - - 4 - (1)

(100g, 0.57mol) 900Mℓ , (1.41g, 9mmol) 가
 0 가 (32Mℓ, 0.62mmol) 가 ,
 MgSO₄ , 1N KOH ,
 60g 42%

¹H NMR (CDCl₃) δ
 (ppm): 0.88 (t, J = 6.9 Hz, 3 H), 1.26-1.31 (m, 8 H), 1.54-1.59 (m, 2 H), 2.54 (t, J = 7.8 Hz, 2 H), 7.04 (d, J = 8.2 Hz, 2 H), 7.38 (d, J = 8.2 Hz, 2 H). FD-MS: m/z 255 (M⁺).

2: 2,6 - (t -) (2) .

2 - 2,6 - (80.0g, 0.33mol), (108.8g, 1,6mol), t -
 (115.5g, 0.77mol) DMF 600Mℓ 가 . 3 90 가
 . TLC가 . 2 .

85.1g 54%

¹H NMR

(CDCl₃) δ (ppm): 0.28 (s, 12H), 1.00 (s, 18 H), 7.14 (dd, *J*₁ = 8.5 Hz, *J*₂ = 2.5 Hz, 2 H), 7.64 (d, *J* = 2.5 Hz, 2 H), 8.17 (d, *J* = 8.5 Hz, 2 H). ¹³C NMR (CDCl₃): -4.36, 25.53, 117.35, 125.34, 127.57, 129.73, 135.73, 161.26, 182.17. Mp 131-133 °C. FD-MS: *m/z* 468 (M⁺).

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

2 (37g, 0.079mol) THF 200Mℓ - 78 n - BuLi(2.
5M, 94Mℓ, 0,24mol) 가 - 60 가 , 1 - 78
1 (60.2g, 0.24mol) THF 100Mℓ 가
HI (47%, 143Mℓ, 0.79mol)
TBDMS 10 가 ,
3
MgSO₄
10/90 / 22.4g
51%

¹H NMR (CDCl₃) δ (ppm): 0.91 (t,

J = 7.0 Hz, 6 H), 1.26-1.43 (m, 8 H), 1.71-1.81 (m, 2 H), 2.73 (t, *J* = 7.8 Hz, 2H), 5.21 (s, br, 2H, OH), 6.89 (d, *J* = 2.3 Hz, 2 H), 6.96 (dd, *J*₁ = 9.5 Hz, *J*₂ = 2.5 Hz, 2 H), 7.32 (d, *J* = 8.6 Hz, 4 H, 패널), 7.35 (d, *J* = 8.6 Hz, 4 H, 패널), 7.57 (d, *J* = 9.4 Hz, 2 H). ¹³C NMR (CDCl₃): 14.16, 22.72, 29.26, 29.52, 31.60, 31.86, 35.90, 106.84, 118.58, 127.07, 128.46, 128.98, 129.64, 131.04, 134.94, 136.30, 142.10, 151.69. Mp 162-164 °C. FD-MS: *m/z* 558 (M⁺).

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

3 (17.8g, 0.032mol) 65Mℓ 0
(16Mℓ, 0.096mol) 가
(3 × 200Mℓ) 2N HCl (2 × 200Mℓ) MgSO₄
13.1g 50%

¹H NMR (CDCl₃) δ (ppm): 0.92 (t,

J = 7.0 Hz, 6 H), 1.26-1.43 (m, 8 H), 1.76-1.81 (m, 2 H), 2.81 (t, *J* = 7.9 Hz, 2H), 7.25 (dd, *J*₁ = 9.6 Hz, *J*₂ = 2.3 Hz, 2 H), 7.34 (d, *J* = 7.9 Hz, 4 H, 패널), 7.44 (d, *J* = 7.9 Hz, 4 H, 패널), 7.61 (d, *J* = 2.2 Hz, 2 H), 7.86 (d, *J* = 9.6 Hz, 2 H). FD-MS: *m/z* 822 (M⁺).

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

4(2.7g, 0.003mol), () (1.6g, 0.007mol), 1,1' - ()
) ()/ (0.16g, 4 6mol%), 1,1' - () (0.
 11g, 4 6mol%) (1.9g, 0.02mol) 50Mℓ 50Mℓ 가 . 10
 80 가 . 50Mℓ 가 .
 1.3g 53%

¹H NMR (CDCl₃) δ (ppm): 0.91 (t, J = 7.0 Hz, 6 H), 0.98 (s, 12 H), 1.34-1.45 (m, 8 H), 1.80-1.82 (m, 2 H), 2.80 (t, J = 7.9 Hz, 2 H), 3.70 (s, 8 H), 7.39-7.40 (m, 4 H), 7.64-7.65 (m, 8 H), 8.24 (s, 2 H). ¹³C NMR (CDCl₃): 14.16, 21.93, 22.73, 29.30, 29.38, 31.39, 31.79, 31.92, 35.89, 72.21, 125.97, 128.24, 128.27, 129.98, 130.97, 131.29, 134.42, 136.17, 137.75, 141.67. M.p. 172-174 °C; FD-MS: m/z 750 (M⁺).

6: 2,5 - (6)

2,5 - - p - (35g, 0.13mol) (210g, 1.32mol) 1.2
 lite) em . 2 가 . (ce
 P₂O₅ pH가 1 HCl

¹H NMR (DMSO) δ (ppm): 5.06 (s, br, 2 H), 8.02 (s, 2 H); FD-MS: m/z 324 (M⁺).

7: 2,5 - (7)

6(19.2g, 0.059ml) 30Mℓ 가 . 20
 가 4 가 . 9.
 2g 90%

¹H NMR (CDCl₃) δ (ppm): 8.20 (s, 2 H). Mp 80-82°C.

8: 1,4 - - 2,5 - (4 -)) (8)

7(19.2g, 0.059mol) CH₂Cl₂ 100Mℓ (16.6g, 0.12mol) 가
 (45.3g, 0.21mol) 가 가 , CH₂Cl₂ MgSO₄ CH₂Cl₂ 50Mℓ
 N HCl , 31.8g 74%

¹H NMR (CDCl₃) δ
 (ppm): 0.88 (t, J=6.7 Hz, 6 H), 1.26-1.32 (m, 28 H), 1.62-1.67 (m, 4 H), 2.69 (t, J
 = 7.6 Hz, 4 H), 7.32 (d, J= 7.9 Hz, 4 H), 7.58 (s, 2 H), 7.76 (d, J= 7.9 Hz, 4 H).
 Mp 128-129 °C.

9: 1

5(1.18g, 1.57mmol) 8(1.14g, 1.57mmol) 7Mℓ (A
 liquat,) 336(0.11g, 0.27mmol) 2N Na₂CO₃ (2.6Mℓ, 5.2mmol) 가 10
 () (54mg, 3mol%) 가 24
 100 가 가 가 6 가
 1N HCl 1.58g 92%
 (Soxhlet) THF
 2 60 13.1g 77%
 6810 , 1.88(THF
) 436 47

10: 1 2

1(0.5g, 0.46mmol) THF 10Mℓ THF 15Mℓ LAH(0.14g, 3.6mmol)
 0 가 . 1 , 1N HCl CH₂Cl₂
 NaHCO₃ MgSO₄
 0.3g 60%

11: 2 3

2(0.2g, 0.18mmol) CH₂Cl₂ 10Mℓ 0 BF₃ (1.5Mℓ,
 12.2mmo) 가 . 20 , , NaHCO₃
 MgSO₄ 45
 0.15g 75%
 18800 , 2.38(THF)
 432 ,

EL

12

EL

EL

a) - - (ITO)

b) PEDOT (1.3%, (Bayer Corp.) (Baytron) P)
 ITO - 500 20 120

c) (30ml PEDOT 30mg) 0.2 μ m (Teflon)
 - 500 700

d) 10:1 Mg Ag 2000

EL

4 2 PL 5 3

Ag EL (PL) EL ITO(PEDOT)/ /Mg:

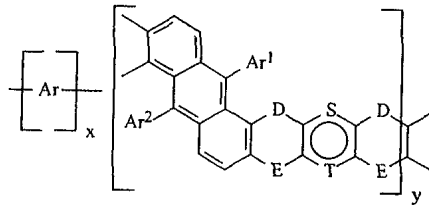
가 EL

(57)

1.

1

1



$0 < x < 1, 0 < y < 1 \quad x + y = 1$;

S T , R 1 24 , - R, N - R(, C , N 4
 40 , 6 28) ;

D E , D E 가 R - C - R
 (, C R) ;

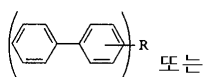
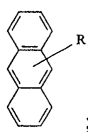
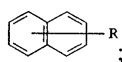
Ar¹, Ar² Ar 6 40 ;

Ar¹, Ar² Ar 4 40 .

2.

1 ,

Ar¹ Ar² 가 .



3.

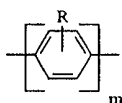
1 ,

Ar Ar .

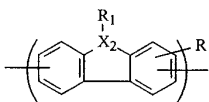
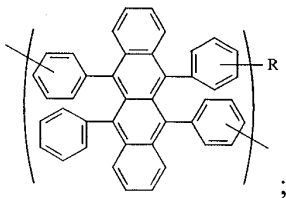
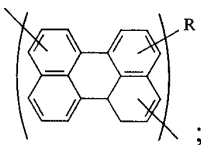
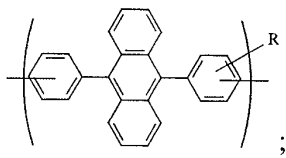
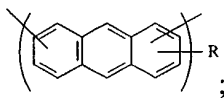
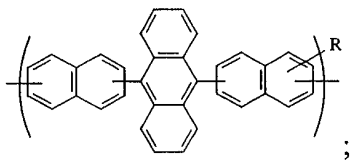
4.

1 ,

Ar .

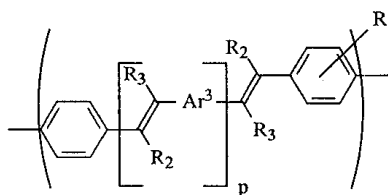


m 1 3 .



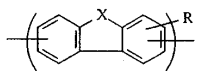
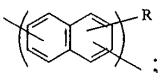
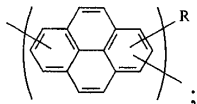
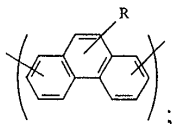
R₁ , 1 24 , 6 28 , 4 40 ;

X₂ .

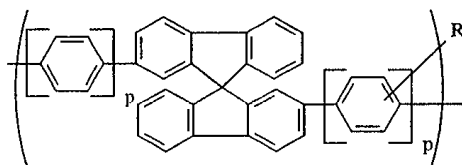


Ar³ Ar ;

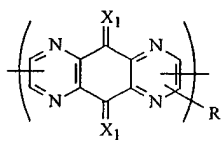
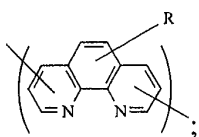
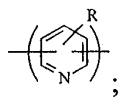
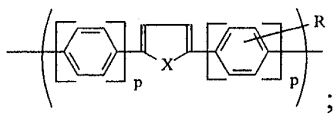
R₂ R₃ , 1 24 , 6 28 , 4 40 .



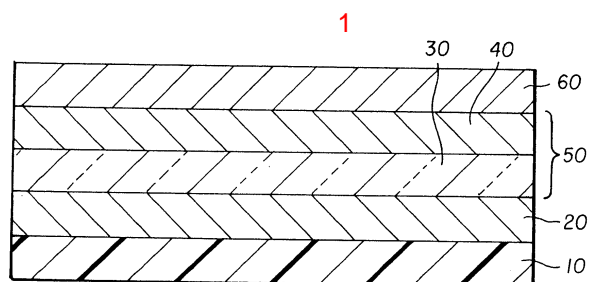
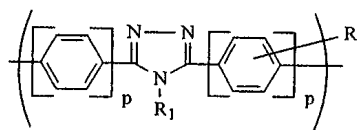
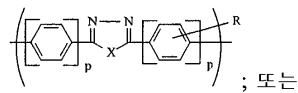
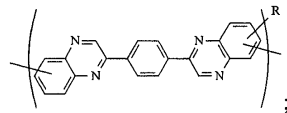
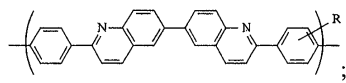
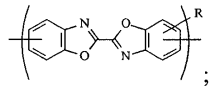
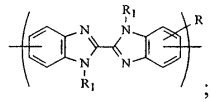
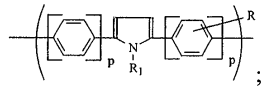
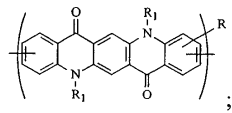
X O S .



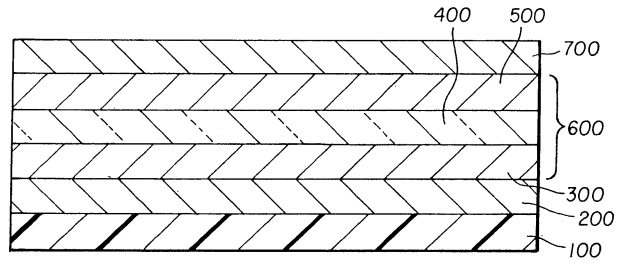
,
p 0 2 .



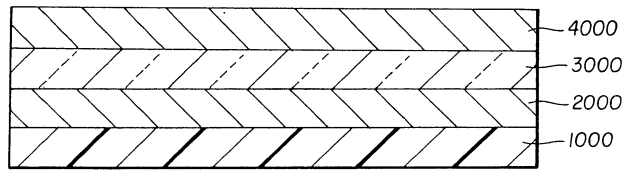
,
X₁ 0 2 .



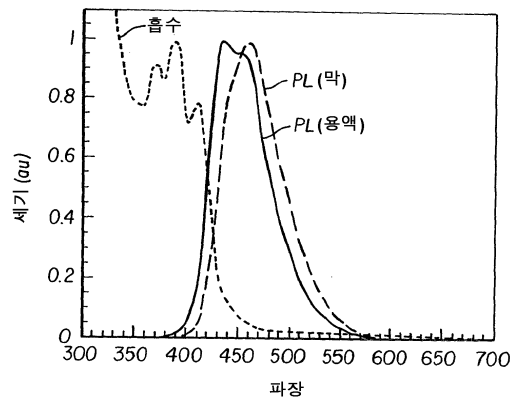
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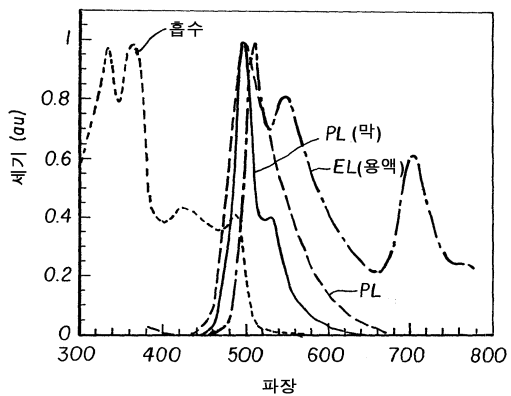
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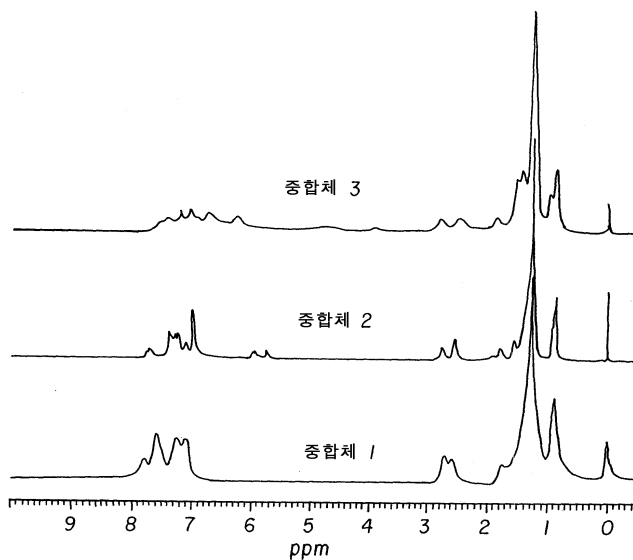
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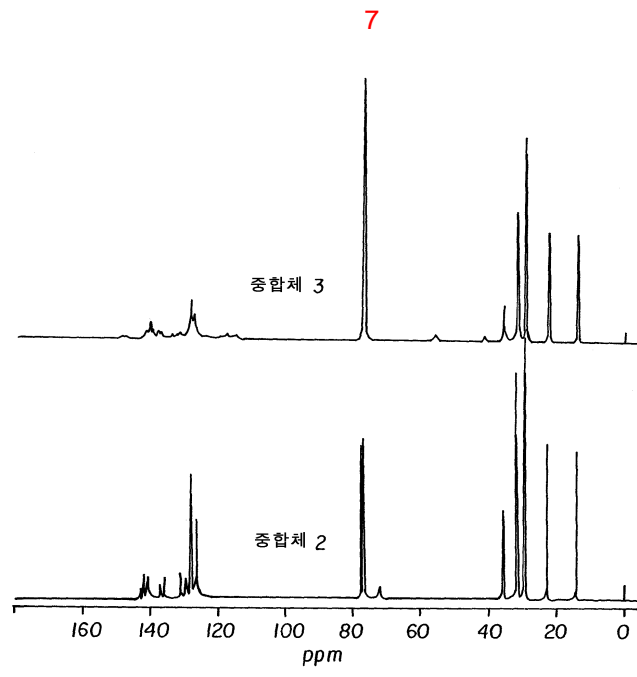


5



6





专利名称(译)	一种在发光层中具有二芳基蒽梯型聚合物的电致发光器件		
公开(公告)号	KR1020030019141A	公开(公告)日	2003-03-06
申请号	KR1020020050811	申请日	2002-08-27
[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	ZHENG SHIYING 정시영 SHI JIANMIN 시지안민 VAETH KATHLEENMICHELLE 바에쓰카틀린미셸		
发明人	정시영 시지안민 바에쓰카틀린미셸		
IPC分类号	H01L51/00 H01L51/50 H01L51/30 C08G61/00 C09K11/06		
CPC分类号	H01L51/0035 H01L51/5012 Y10S428/917 H01L51/0043 H01L51/0044 H01L51/0052		
代理人(译)	KIM, CHANG SE 张居正, KU SEONG		
优先权	09/941009 2001-08-28 US		
外部链接	Espacenet		

摘要(译)

本发明涉及具有发光层的有机发光二极管，所述发光层包括用于形成均聚物的重复单元或包含以下化学式1的结构共聚物，所述发光层设置在阳极，阴极，阳极和阳极之间。阴极。该等式与本申请中定义的相同。

