

(19)
(12)

(KR)
(A)

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C09K 11/06

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(43)

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2004 09 30

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(87)
(87)

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2003 07 31

(30)JP-P-2002-00012224 2002 01 21 (JP)
JP-P-2002-00012222 2002 01 21 (JP)
JP-P-2002-00014881 2002 01 23 (JP)
JP-P-2002-00172127 2002 06 12 (JP)

(71)가 가
2 14 8

(72)2 14 8가 가
2 14 8가 가
2 14 8가 가
2 14 8가 가

가 가1 1 3-21

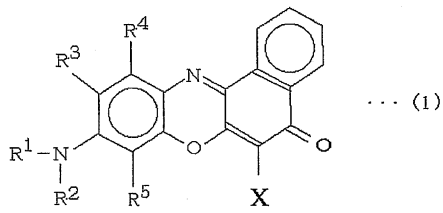
가 가2 6-9

(74)
:

(54),

가 , , 가
.
(1)
:

((1))



, , , EL, ,

가 , (magenta) 가 ,

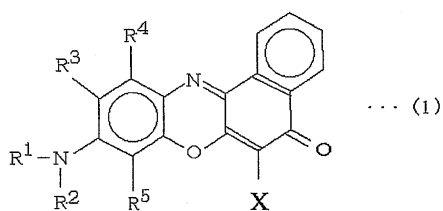
(EL(electroluminescence)) 가 .
 , 가 가 , .

가 , 가 / CIE X 가 0.62, 0.63

(1)

:

((1))

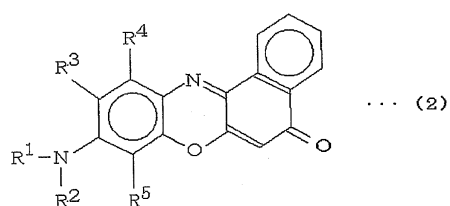


[, (1) , R¹
 -CR⁶R⁷-(, -CR⁶R⁷-
 , R⁶ R⁷) , R⁶ , R¹ R³ -CH₂CH₂
 R² , , R² R⁵ -CH₂CH₂-CR⁸R⁹-(, -CR⁸

R^9 - , R^8 R^9 , R^8 R^9) ,
 R^3 , R^1 R^4 ,
 R^4 R^3 ,
 R^5 R^2 ,
 X].

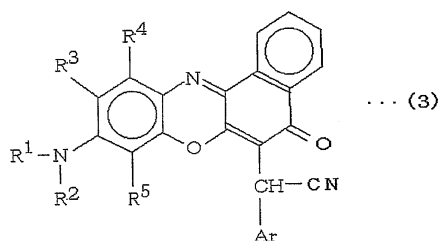
(1) (2)

((2))



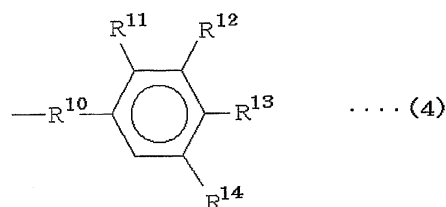
(, (2) , R^1 , R^2 , R^3 , R^4 R^5).
(3)

((3))



(, (3) , R^1 , R^2 , R^3 , R^4 R^5 , Ar (4), (6)
(7) :

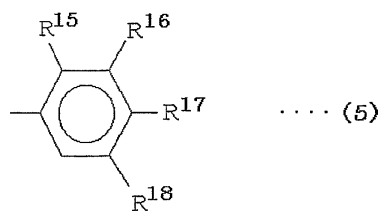
((4))



(, (4) , R^{10} , R^{11} R^{12} ,
 $-CF_2-O-CF_2-$, R^{12} ,
 $-CF_2-O-CF_2-$, R^{13} ,
 $-CF_2-O-CF_2-$, (5) ,
 $-CF_2-O-CF_2-$, R^{14} , R^{13} , R^{12} ,
 $-CF_2-O-CF_2-$, R^{13} ,

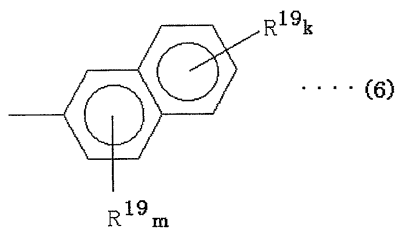
),

((5))



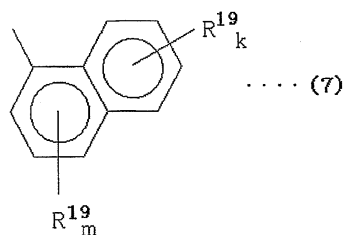
(, (5) , R¹⁵ R¹⁶ -CF₂-O-CF₂- , R¹⁶
 , R¹⁷ 1 5 -CF₂-O-CF₂- , R¹⁵ -CF₂-O
 -CF₂-, R¹⁷ 1 5 , R¹⁶ -CF₂-O-CF₂- , R¹⁷ -CF₂-O-CF₂- , R¹⁷
 18 , R¹⁷ 1 5 , R¹⁶ 1 5 , R¹⁶
 17),

((6))



(, (6) , R¹⁹ , m 1 3 , 1 5
 , k 1 4), , m k R¹⁹

((7))



(, (7) , R¹⁹ , m 1 3 , 1 5
 , k 1 4). , m k R¹⁹

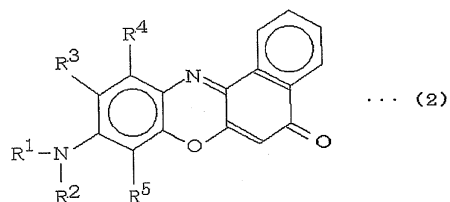
(3)

(2)

(8)

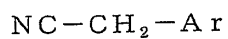
:

((2))



(, (2) , R¹, R², R³, R⁴ R⁵),

((8))

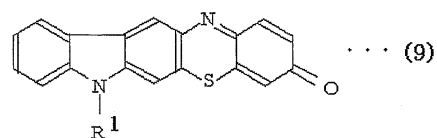


(, (8) , Ar).

(9)

:

((9))

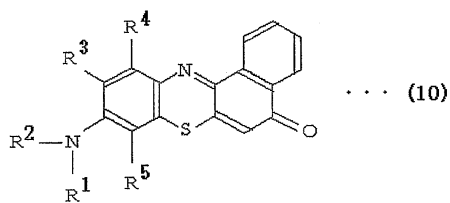


(, (9) , R¹).

(10)

:

((10))



(, (10) , R¹, R², R³, R⁴ R⁵).

, (9)

R¹ (, R¹)

4-

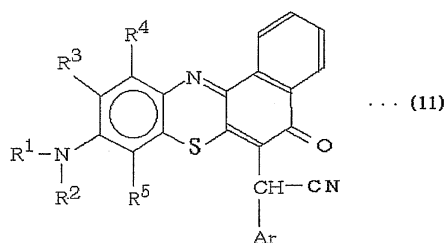
, .

가 R¹ 4- R² (, R¹ R² 1-)

(11)

:

((11))



(, (11) , R^1, R^2, R^3, R^4, R^5 , Ar 2).

(11) $NC-CH_2-Ar$ (, Ar 2) (10)

NC-CH₂-Ar(, Ar 2)

1) , 1 (1), (3), (9), (10) (1

(hole)

1 (1), (3), (9), (10)

(11)

1

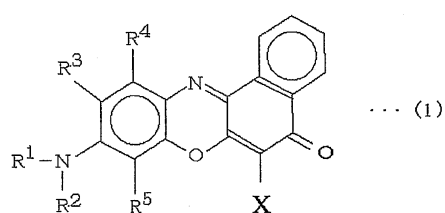
(11) 1 (1), (3), (9), (10)

1

()

(1) :

((1))



(1) , R^1 , 1 5 . R^1

(1) , R^2 , R^1 1 5 . R^2 ,

R^1

. R^1 R^2

R^1 , R^6 R^3 R^7 -CH₂CH₂-CR_{1 5}⁶R⁷-(, -CR_{1 5}⁶R⁷- , R^6 R^7)

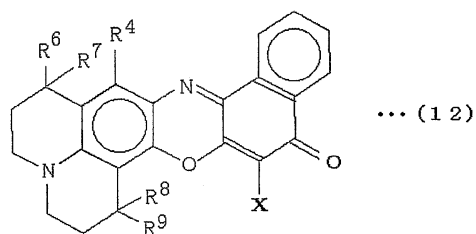
R^1 R^2 가 -NR¹R² , -n-

, -i-

$$\begin{array}{c} R^2 \\ , \\ R^8 \end{array} \quad \begin{array}{c} R^5 \\ R^9 \end{array} \quad -CH_2CH_2-CR^8R^9-(\quad , \quad -CR^8R^9- \quad , \quad R^8 \quad R^9)$$

$$\begin{array}{c} R^1 \\ 2CH_2-CR^8R^9- \end{array} \quad -CH_2CH_2-CR^6R^7- \quad (1) \quad , \quad R^2 \text{가} \quad R^5 \quad -CH$$

$$(\quad (12))$$



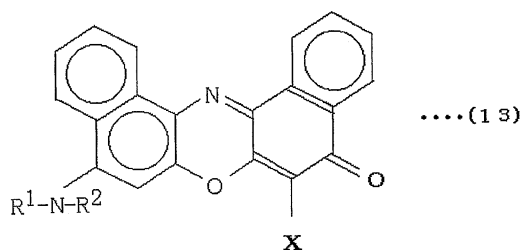
$$(12) \quad R^4, R^6, R^7, R^8, R^9 \quad X$$

$$(1) \quad , R^3 \quad R^4$$

$$. R^3 \quad R^4 \text{가}$$

$$(13)$$

$$(\quad (13))$$



$$(13) \quad , R^1, R^2 \quad X$$

$$(1) \quad X$$

$$(1) \quad -NR^1R^2 \text{가} \quad X$$

$$\pi$$

$$R^1-N-R^2$$

$$\pi$$

$$(1)$$

$$(2)$$

N-

N-

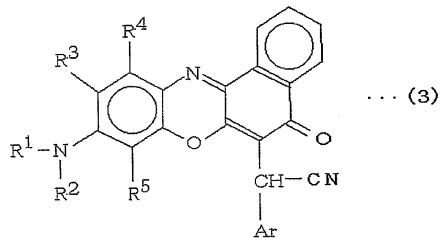
$$(2)$$

가 5

100 250 , 100 170 .

가

(3) :



(3) , R¹ , 1 5 . R¹

(3) R² , R¹ R² 1 5 . R² ,

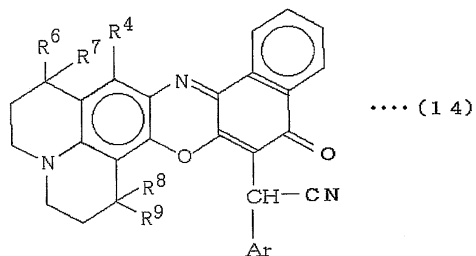
R¹ R³ -CH₂CH₂-CR⁶R⁷-(, -CR⁶R⁷- , R⁶ R⁷ ,

R¹ R² 가 -NR¹R² , -n- ,

R² R⁵ -CH₂CH₂-CR⁸R⁹-(, -CR⁸R⁹- , R⁸ R⁹ ,

R¹ R³ -CH₂CH₂-CR⁶R⁷- , R² 가 R⁵ -CH₂CH₂-CR⁸R⁹- (3) (14) :

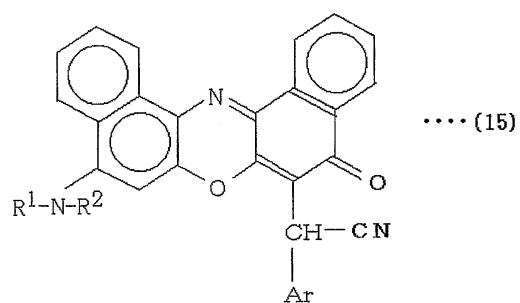
((14))



(14) , R⁴ , R⁶ , R⁷ , R⁸ R⁹ . (14) Ar

(3) , R³ R⁴ , R³ R⁴ 가 (15) :

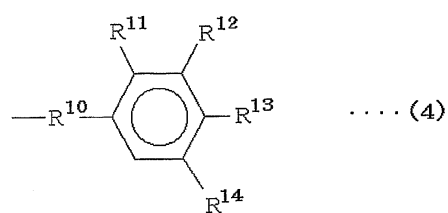
((15))



(15) , R¹ R²

(3) Ar (4), (6) (7) :

((4))



(4) R¹⁰

(4) R¹¹ , R¹²

-CF₂-O-CF₂-

(4) , R¹² , 1 5

(,

가 1 5

), R¹¹

-CF₂-O-CF₂- ,

R¹³

-CF₂-O-CF₂-

, r

, ,

(4) , R¹³

-CF₂-O-CF₂- ,

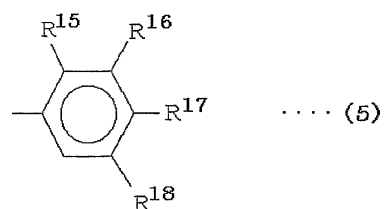
(5) 1 5

(4) R¹⁴ R¹³

, R¹³

1 5

((5))



(5) , R¹⁵

, R¹⁶

-CF₂-O-CF₂-

(5) , R¹⁶

-CF₂-O-CF₂- , R¹⁷

, 1 5

-CF₂-O-CF₂- ,

, R¹⁵

(5) , R¹⁷

-CF₂-O-CF₂-

, 1 5

R¹⁶

(5) , R¹⁸ R¹⁷

1 5

, R¹⁷

R¹², R¹³, R¹⁶ R¹⁷

1 5

가

, R¹², R¹³ (3), (14) (15) Ar, R¹⁰
R¹⁴ 1

R¹¹

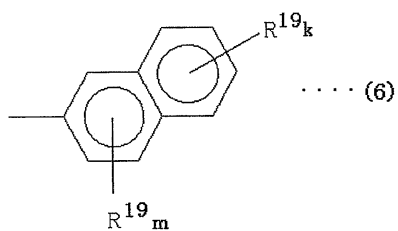
(1)

조합례	R ¹¹	R ¹²	R ¹³	R ¹⁴
1	-H	-CF ₃	-H	-CF ₃
2	-H	-F	-CF ₃	-H
3	-H	-CF ₃	-F	-H
4	-H	-CF ₃	-CN	-H
5	-H	-CN	-CF ₃	-H
6	-H	-F	-CN	-H
7	-H	-CN	-F	-H
8	-H	-F	-CF ₃	-H
9	-CF ₂ -O-CF ₂ -		-H	-H
10	-H	-CF ₂ -O-CF ₂ -		-H
11	-H	화학식 (5)	-H, -CF ₃ , -CN, 또는 -H	-H
12	-F	-F	-CF ₃	-H
13	-CF ₃	-H	-CF ₃	-H

1, 2,5-, 2,6-, 3,4-, 3,5-, 2,4-
; 3-; 4-; 3,5- ()
; 4-; -3-; 6-; -2-

Ar (6) :

((6))



, (6) R¹⁹
R¹⁴ (6) k 1 4, m 1 3 1 5
(6) m k

(7) , 1 가 1 , 3 , 4 , 5 ,
 6 , 7 8 ()-2- , 가 1 , 3 ,
 4 , 5 , 6 , 7 8 -2- , 2 ,
 가 1 1 3 , 1 4 , 1 5 , 1 6 , 1 7 ,
 1 8 , 3 4 , 3 5 , 3 6 , 3 7 ,
 3 8 , 4 5 , 4 6 , 4 7 , 4 8 , 5
 6 , 5 7 , 5 8 , 6
 7 ()-2- , 2 가 1 3 ,
 1 4 , 1 5 , 1 6 , 1 7 , 1 8 , 3
 4 , 3 5 , 3 6 , 3 7 , 3 8 , 4
 5 , 4 6 , 4 7 , 4 8 , 5
 7 , 5 8 , 6 7 , 6 8 , 7
 -2- , 3 가 1 , 3 , 4 , 1 , 3
 5 , 1 , 3 6 , 1 , 3 7 , 1 , 3 8 , 1 ,
 4 , 5 , 1 , 4 6 , 1 , 4 7 , 1 , 4 8 ,
 , 1 , 5 6 , 1 , 5 7 , 1 , 5 8 , 1 ,
 6 , 7 , 1 , 5 8 , 3 , 4 5 , 3 , 4 6 ,
 , 3 , 4 7 , 3 , 4 8 , 3 , 5 6 , 3 ,
 5 , 7 , 3 , 5 8 , 3 , 6 7 , 3 , 6 8 ,
 , 4 , 7 8 , 4 , 5 6 , 4 , 5 7 , 4 ,
 5 , 8 , 4 , 6 7 , 4 , 6 8 , 5 , 7 ,
 , 5 , 6 7 , 5 , 6 8 , 5 , 7 , 8 ,
 7 8 ()-2- , 3 가 1 , 3 ,
 4 , 1 , 3 5 , 1 , 3 6 , 1 , 3 7 , 1 ,
 , 3 8 , 1 , 4 5 , 1 , 4 6 , 1 , 4 7 , 1 ,
 7 , 1 , 4 8 , 1 , 5 6 , 1 , 5 7 , 1 ,
 , 5 8 , 1 , 6 7 , 1 , 5 8 , 3 , 4 ,
 5 , 3 , 4 6 , 3 , 4 7 , 3 , 4 8 , 3 ,
 , 5 6 , 3 , 5 7 , 3 , 5 8 , 3 , 6 ,
 7 , 3 6 , 4 8 , 7 , 8 , 5 6 , 4 ,
 , 5 7 , 4 8 , 5 6 , 4 7 , 4 8 , 6 ,
 8 , 4 7 , 8 , 5 6 , 7 , 5 6 , 8 , 5
 , 7 8 , 6 , 7 8 -2- 1,3,4,5,6,7,8-

(3) , Ar -CH- -NR¹R²가 , -Ar
 , H가 δ +가 , CH C
 , 가 , π
 , R¹-N-R² 가 π
 , Ar , 가 ,

(3) .

(2) (8)
 :

(8))

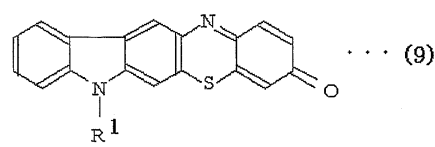
NC-CH₂-Ar .

(3) , , 가 5 ,
 100 170 , 100 250 ,

가

(9) :

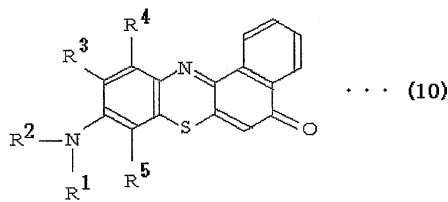
((9))



, (9), R¹

(10) :

((10))

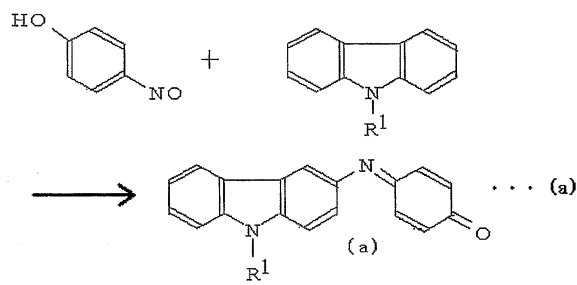


, (10), R¹, R², R³, R⁴, R⁵

(9)

, (a), 4- (a) R¹ (, R¹) :

((a))

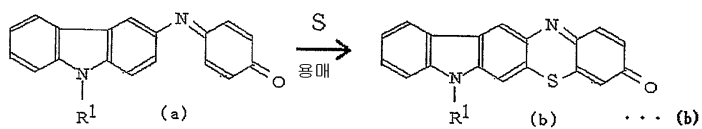


10 (a), , -70 -40 1

, (b), (a) o-

(b), , (9), , :

((b))



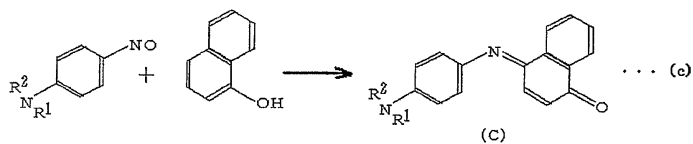
(b) , 100 250 30 5 가

(10)

(c) , R^1, R^2 (, R^1, R^2)가 4- R^3, R^4 (4- R^3, R^4) 1- R^5 가

(c) :

(c))



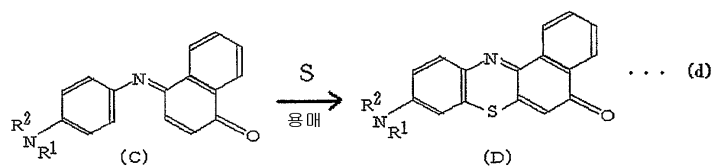
(c) O 100 1 10 , , , , ,

(d) (a) o-

(d)가 :

(10)

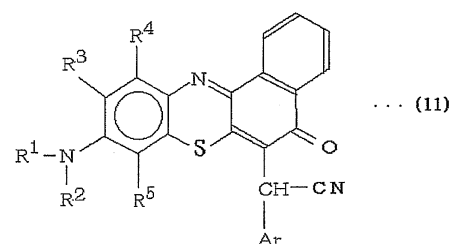
(d))



(d) , 100 250 30 5 가

(10) , (11)

(11))



(11) R^1, R^2, R^3, R^4, R^5 Ar

(2) 가 , 가 (3)
(2) ITO , In_2O_3 , SnO_2 , ZnO , CdO , ,

0.5 % . , 0.01 2 %, 0.05

30 ~ 50 nm, 100 ~ 300 nm . 가
가 , , , , ,

(3) 100 nm 가 0.1 가

(4) 가 , MgAg, (4)

(4) (1) (3)

ITO, 4,4'-(Cz-TPD), m-MTDATA(4,4',4''-EL)

2

2 (6) (4) (B) (1) (2), (hole) (5), (3a,3b),
 (1), (2) (4) 1 (A) .
 2 (B) (3a) (3b) (3a)
 (3b) DPVBi DPVBi
 (5) , N,N'- -N,N'- (m-)- (TPD) α -NPD
 , , , π
 (6) , 2-(4-tert-)-5-(4-)-1,3,4-
 2,5- (1-)-1,3,4- 2,5- (5'-tert- -2'-)
 (Alq3),
 (Bebq2) .
 2 (B) (6) Alq3 .
 EL .
 2 (B) 1 (B) 1 (A) (A) . , 2
 (B) 1 (A) .
 3 3 EL
 3 (C) (1) (2), (5), (3), (8) (4)
 .
 3 (C) (B) .
 4 . 4 (D) (1), (2),
 (5), (3) (4) .
 1 4 , ,
 2 (, , , 2
), , , 2 (, ,
 , , 2), ,
 3
 .
 40 % , 0.01 20 % , 50 80 % (PVK), 5
 , (rubrene) , Alq3가
 .
 , ,
 EL , EL EL

[illegible]

29 26 , (18)

IR .

30 26 (18)

NMR .

31 26 , (18)

.

(1)

< >

500 Mℓ 가
250 Mℓ .

가

5.0 g(15.7 mmol),

,

5.63 g(23.6 mmol)

(bath)

135

가

, 2.5

204 205 .

IR

,

5

, NMR

200 mg
6 .

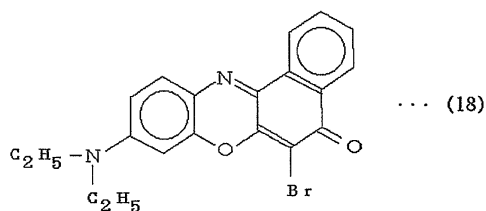
C: 60.47 H: 4.31 N: 7.05 O: 8.05 Br: 20.11

C: 59.19 H: 4.24 N: 6.43 O: 8.36 Br: 21.61

(18)

(同定) :

((18))



(18)

F-4500 10 mg/ ℓ 가

7 .

()

(勵起) 365 nm

400 nm

700 nm

1200 nm/

5.0 nm

5.0 nm

(photomultiplier) 700 V

7, 550 700 nm

< >

5 Mℓ 70 mg, 2,5- (1-)-1,3,4- (BND) 30 mg
 1, (18) 0.15 mg, 5 Mℓ가 가
 (() , US-2)

20 ITO (50×5
 0 mm, ITO 200 μm, 三容眞空工業(株)) 10 , 2-
 10 (blowing) , ()
 254 nm) UV 5 , 가 ITO (()
 , 1H-D7) , 1,500 rpm, 3
 가 100 μm가 50
 30 (大亞眞空技研(株) , VDS-M2-46) (Al:Li= 9
 9:1 , ()) 4×10⁻⁶ Torr 150 nm , 1

, () BM-7 Fast
 , 20V 10.65 mA 가 1095.00 Cd/m² , CIE X (,
 X)가 0.6642, E Y (, Y)가 0.3270 .

< >

ITO (50×50 mm, 三容眞空工業(株)) 10 , 2-
 10 , 254 nm) UV 5 ITO (()
 ITO (大亞眞空技研(株) , UDS-M2-46) , 4×10⁻⁶ Torr
 45 nm TPD , (18) Alq3 2%
 40 nm) 150 nm , 1 (Al:Li= 99:1 , ()

, () BM-7 Fast
 , 16V 33.81 mA 가 84.38 Cd/m² , X가 0.6717 Y가 0.3283 .

(2)

< >

500 Mℓ 가 1.27 g(4.0 mmol), N- 0.53 g(4.0 mmol)
 200 Mℓ 가 110 가 , 2 700 Mℓ
 , 2 ,
 , 830 mg , 220 222 , IR 8
 , NMR 9 .

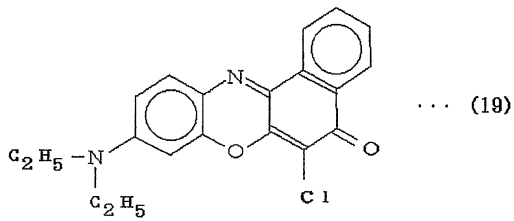
C: 68.08 H: 4.86 N: 7.94 O: 9.07 Cl: 10.05

C: 67.79 H: 5.01 N: 7.89 O: 8.89 Cl: 10.31

(19)

:

((19))



(19)

10 mg/ ℓ 가

1

10

()

365 nm

400 nm

800 nm

1200 nm/

5.0 nm

5.0 nm

700 V

10

550 700 nm

< >

5 Mℓ (19) 0.3 mg (() 70 mg, 2,5- (1-) - 1,3,4- (BND) 30 mg 가 , 5 Mℓ가 , US-2) , ITO (50×50 mm, ITO 20 200 μm, 三容眞空工業(株)) 10 , 2- 10 (254 nm) UV 5 , 가 ITO , (() , 1H-D7) , 1,500 rpm, 30 가 100 μm가 (大亞眞空技研(株) , VDS-M2-46) (Al:Li= 99:1 , ()) 4×10⁻⁶ Torr 150 nm , 1

BM-7 Fast , () 20V 10.06 mA 가 1215 Cd/m² , X가 0.6229 Y가 0.3599 .

< >

ITO (50×50 mm, 三容眞空工業(株)) 10 , 2- 10 (254 nm) UV 5 ITO , (()) ITO (大亞眞空技研(株) , UDS-M2-46) , 4×10⁻⁶ Torr 45 nm TPD , (6) Alq3 0.3%

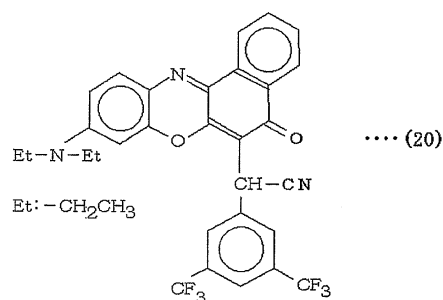
40 nm (Al:Li= 99:1 , ()) 150 nm , 1 ,
 , () BM-7 Fast
 , 13V , 38.53 mA 가 361 Cd/m² , X가 0.6489 Y가 0.3511 .

(3)

A

100 Mℓ 가 0.50 g(1.57 mmol), 3,5- () 0.40 g
 (1.57 mmol) 25 Mℓ 가 135
 가 , 4 , , 가 30
 , 5% , , 가 30
 , 30 mg , 12% , 257 260
¹ H-NMR (20) 11 12
 IR :

((20))

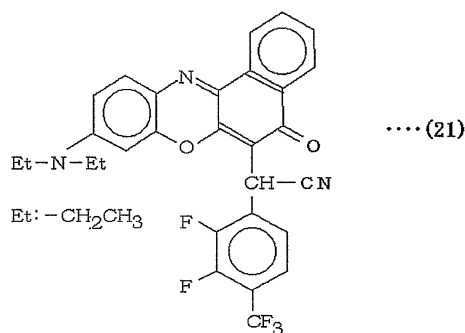


(4)

B

100 Mℓ 가 0.50 g(1.57 mmol), 2,3- -4-()
 0.35 g(1.57 mmol) 25 Mℓ 가 135 가 , 3
 , 5% , , 가 30
 , 10 mg , 6.4% , 172 174
 IR 13 (21)
 :

((21))



(5)

5 Mℓ (, PVK , 關東化學(株)) 70 mg, 2,5- (1-)-1,3,4-
 - (, BND ,) 29 mg A 1 mg , 5 Mℓ가
 US-2) , 20 (() ,
 ITO (50×50 mm, 三容眞空工業(株)) 10 , 2-
 10 , UV (() .
 , 172 nm) UV 30 , 가 ITO
 , (() , 1H-D7) 1,500 rpm,
 3 50 30
 (大亞眞空技研(株) , VDS-M2-46) (Al:Li= 99:1 , ()
) 4×10^{-6} Torr 1500 , EL
 EL 2 , () Fast BM-7 .

(6)

5 Mℓ PVK 68 mg, 2-(4-tert- -5-(4-)-1,3,4- (, PBD)
 31.2 mg A 0.8 mg , 5 Mℓ가 가
 EL , 5 5 2

(7)

5 Mℓ PVK 63.7 mg, 2,5- (5'-tert- -2'-) (, BBO) 35.5 mg
 A 0.8 mg , 5 Mℓ가 가
 EL , 5 5 2

(8)

5 Mℓ PVK 64.0 mg, BBOT 35.6 mg A 0.4 mg , 5 Mℓ가
 가
 5 EL , 5 2

(1)

5 Mℓ PVK 68.2 mg, PBD 31.3 mg 0.5 mg , 5 Mℓ가
 가
 EL , 5 5 2

(2)

배합량 m g		실시에 5	실시에 6	실시에 7	실시에 8	비교예 1
PVK		70.0	68.0	63.7	64.0	68.2
BND		29.0				
PBD			31.2			31.3
BBO T				35.5	35.6	
색소 A		1.0	0.8	0.8	0.4	
나일 레드						0.5
최고 휘도cd/m ²		2454.4	2215.0	2629.2	3475.6	2137.0
색도	X	0.6417	0.6307	0.6330	0.6278	0.5402
	Y	0.3477	0.3535	0.3610	0.3648	0.4324

(9)

5 M $\varnothing$ (, PVK , 關東化學(株)) 70.1 mg, 2,5- (1-)-1,3
 ,4- (, BND ,) 29.3 mg A 0.61 mg , 5 M $\varnothing$ 가
 가
 , US-2) , 20
 , 2- 10 ITO (50×50 mm, 三容眞空工業(株)) 10
) . , 172 nm) UV 30 , UV 가 ITO
 , () , 1H-D7)
 1,500 rpm, 3 50 3
 0 , (大亞眞空技研(株) , VDS-M2-46) (Al:Li= 99:
 1 , ()) 1×10⁻⁶ Torr 1500 , EL
 .
 EL , () Fast BM-7
 3 .

(10)

5 M $\varnothing$ PVK 70.1 mg, BND 29.3 mg, A 0.61 mg , ,
 5 M $\varnothing$ 가 가 , 5 M $\varnothing$
 PVK 69.9 mg, BND 29.1 mg, 0.4 mg A 0.6 mg ,
 5 M $\varnothing$ 가 가
 9 EL .
 9 . 3 .

(11)

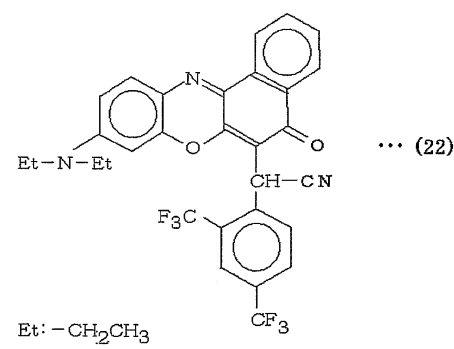
EL A EL B 9
 3 . , 9

(12)

C
 3,5- () 1.57 mmol 2,4- () 1.5
 7 mmol C 3 (22)

C ¹ H-NMR 16

((22))



EL A C 9
3 EL 9

(3)

		실시에 9	실시에 10	실시에 11	실시에 12
총 량 / mg	PVK	70.1	69.9	70.1	70.1
	BND	29.3	29.1	29.3	29.3
	루브렌		0.4		
	나일 레드계 적색 발광 화합물 A	0.6	0.6		
	나일 레드계 적색 발광 화합물 B			0.6	
	나일 레드계 적색 발광 화합물 C				0.6
최고 휘도 cd/m ²		3006.0	2015.0	1349.0	2985.0
색 도	X	0.6248	0.6694	0.6294	0.6218
	Y	0.3453	0.3152	0.3458	0.3636

(13)

ITO, 1×10⁻⁶ Torr N
,N'- (m-)- (TPD) 60 nm (8-) (
(Alq3) 1.7 %가 A , TPD
가 31 nm가 , 150 nm 가 EL
EL , 9 . 4

(14)

TPD 60 nm , 1.6 % Alq3 A
40 nm 가 13 EL
4 .

(4)

		실시에 13	실시에 14
막 두께 nm	TPD	60	60
	Alq3 + 나일 레드계 적색 발광 화합물 A	31	40
배합비	Alq3	98.3	98.4
	나일 레드계 적색 발광 화합물 A	1.7	1.6
최고 휘도 cd/m^2		4623	11990
색도	X	0.6536	0.6497
	Y	0.3184	0.3276

(15)

5 M $\varnothing$ (N-) (, PVK , 關東化學(株)) 70.0 mg, 2,5- (1-)
 -1,3,4- (, BND ,) 14.85 mg, A 0.05 mg,
 (17) (B) 0.10 mg, (16)
 (DPVBi) 15.0 mg , 5 M $\varnothing$ 가 가 ,
 (() , US-2) 20 .
 ITO 10 , IPA 10 ,
 ITO , 가 PL16-110(()) UV 5
 ITO (() , 1H-D7) ,
 50 30 ,
 (大亞眞空技研(株) , VDS-M2-46) (Al:Li= 99:1 , ()
) 10⁻⁶ Torr 150 nm , EL .
 , () Fast BM-7 EL . 5
 . 5 ,
 , 가 EL .

(16)

5 M $\varnothing$ PVK 70.1 mg, BND 14.85 mg, A 0.04 mg, 1
 5 0.10 mg 15
 15.0 mg , 5 M $\varnothing$ 가 가 15
 EL , 5 , 5 , 15
 ,
 가 EL .

(17)

5 M $\varnothing$ PVK 70.0 mg, BND 20.0 mg, A 0.02 mg, 15
 9.95 mg , 5 M $\varnothing$ 가 가 15
 , 5 , 5 , 3
 , 가 EL
 , 5 , 「 A」 A , 「 B」
 B .

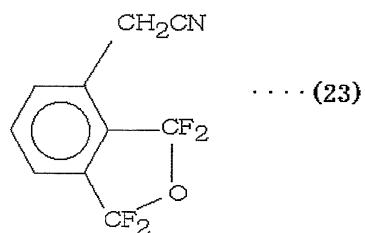
(5)

	실시에 15	실시에 16	실시에 17
PVK	70.0	70.1	70.0
BND	14.85	14.85	20.0
색소 A	0.05	0.04	0.02
색소 B	0.10	0.10	0.03
DPVBi	15.0	15.0	9.95
최고 휘도 cd/m ²	4867.0	3631.0	2819.0
색도 X	0.3788	0.3616	0.3101
Y	0.3547	0.3399	0.3035

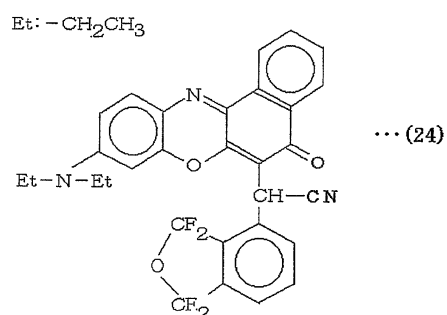
(18)

100 Mℓ 가 0.92 g(2.89 mmol), (23)
 (1) 1.0 g(4.33 mmol) 50 Mℓ
 , 1 , 5% ,
 , , 40 mg ,
 NMR 14 ,
 D ,

((23))



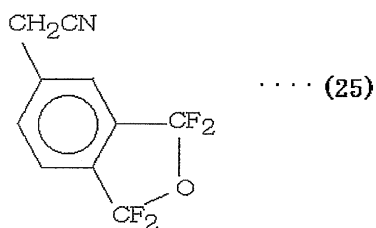
((24))



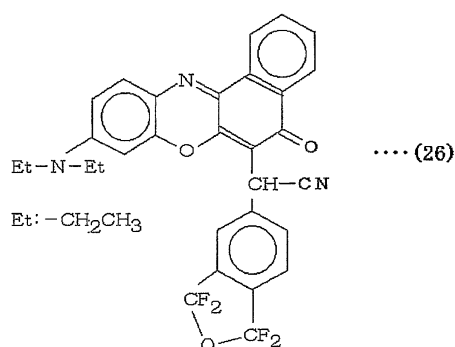
(19)

100 Mℓ 가 0.92 g(2.89 mmol), (25)
 (2) 1.0 g(4.33 mmol) 50 Mℓ
 가 , 1.5 , 5% ,
 , , 50 mg ,
 15 , 250 252 ,
 E , (26) NMR

((25))



((26))



< D EL >

5 Mℓ (24) (, PVK , 關東化學(株)) 70.0 mg, BND 29.7 mg
D 0.3 mg , 5 Mℓ가

9 EL .

EL () Fast BM-7
17V 9.07 mA 가 1575 Cd/m² CIE X 가 0.6552 ,
18V 11.84 mA 가 1815 Cd/m² CIE X 가 0.6563 , 19V 13.98
mA 가 1702 Cd/m² CIE X 가 0.6559 , 20V 16.84 mA 가 150
5 Cd/m² CIE X 가 0.6517 .

< E EL >

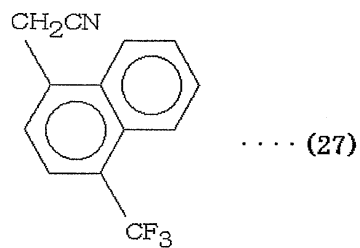
9 ITO , 1×10⁻⁶ Torr N
,N'- (m-)- (TPD) 60 nm , (8-) (A
lq3) 2 % (18)
TPD 31 nm가 , 150 nm 가
, EL .

EL , 9 27V 15.37
mA 가 3660 Cd/m² CIE X 가 0.6266 .

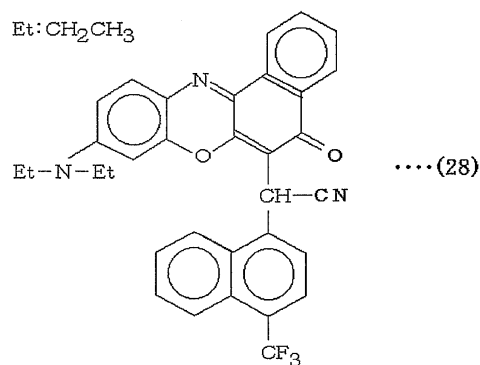
((20))

100 Mℓ 가 0.92 g(2.89 mmol), (27)
(3) 1.0 g(4.33 mmol) 60 Mℓ . 135 가
, 3.5 , , 가 30 ,
5% ,
10 mg NMR 17 ,
(28) F .

((27))



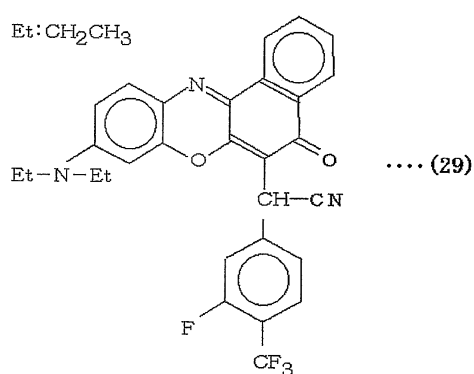
((28))



(21)

100 Mℓ 가 1.0 g(4.92 mmol) 50 Mℓ 1.04 g(3.28 mmol), 3- -4-(135 가 , 2.5 5% , 30 , 40 mg , 215 220 (29) NMR 18 G ,

((29))



5 Mℓ (29) (, PVK , 關東化學(株)) 70.0 mg, BND 29.8 mg G 0.2 mg , 5 Mℓ가 가 , 9 EL , EL () Fast BM-7 6.16 mA 가 1087 Cd/m² CIE X 가 0.6776 , 17V 9.32 mA 가 1444 Cd/m² CIE X 가 0.6780 , 18V 12.71 mA 가 1622 Cd/m² CIE X 가 0.6787 , 19V 15.73 mA 가 1455

Cd/m² X CIE 가 0.6790 , 20V 18.28 mA 가 1120 Cd/m² CIE
 ,N'- (m-)- (TPD) 60 nm , 1×10⁻⁶ Torr N
 Alq3) 1.7 % (29) (8-) G
 가 TPD 가 31 nm가 150 nm
 , EL .

EL , 9 27V 18.53
 mA 가 6043 Cd/m² CIE X 가 0.6326 .
 (22)

6- -3-()
 500 Mℓ 3 26 g(115 mmol) 28 Mℓ 가 .
 5-()-2- 5.5 g(23.1 mmol) 60 Mℓ ,
 , 1 , 5% , pH 3 4 200
 Mℓ , NMR 19 6- 16.9 g()
 , -3-()

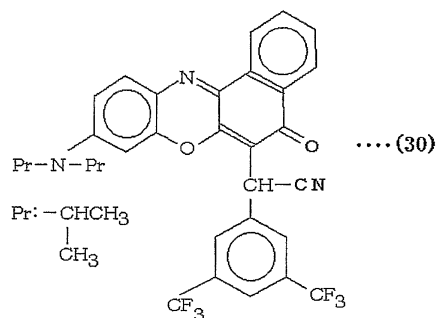
< >

500 Mℓ 가 6- -3-() 16.9 g, 2- -1,4-
 4.0 g(23.1 mmol), 150 Mℓ 21
 , 10% 200 Mℓ
 , 0.50 g , NMR 20

< >

100 Mℓ 가 0.46 g(1.33 mmol), 3,5- ()
 0.50 g(1.99 mmol) 50 Mℓ 135 가 , 2
 , 5% , 가 30
 , 14 mg , 183 185
 : (30) NMR 21

(30)

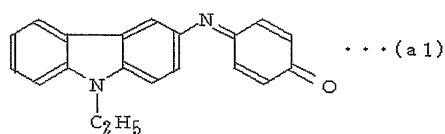


(23)

< >

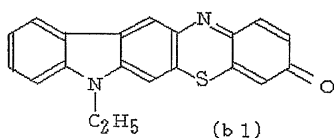
1000 Mℓ 3 600 g , -50 -60 17.5 g(
 89.7 mmol) 4- (40%)) 25 g(122 mmol) 가 , , -30 -40
 6 , 3 가
 , 5% 가
 , 36 g . NMR 22 . NMR
 (a1) :

((a1))



200 Mℓ 3 (a1) 10 g(33.3 mmol), 2.13 g(66.6 mmol), 0.4 g o-
 50 Mℓ , 190 가 , 2
 o-
 1.3 g . NMR 23 . NMR
 (b1) :

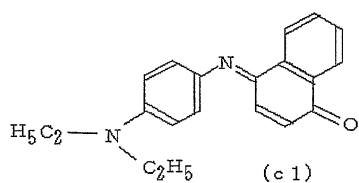
((b1))



(24)

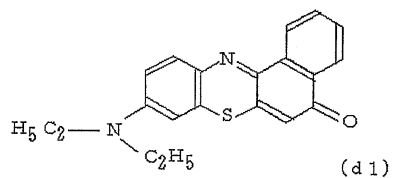
2,000 Mℓ 3 8.0 g(200 mmol), 300 g 0
 1- 14.0 g(97.1 mmol) N,N- -4- 16.6 g(93.4 mmol) (600 Mℓ)
 30 , 1500 Mℓ
 8.0 g . NMR 24 . NMR
 (c1) :

((c1))



300 Mℓ 가 (c1) 8.0 g(26.3 mmol), 1.69 g(52.6 mmol), 0.3 g o-
 50 Mℓ , 185 가 2.5
 o-
 1.0 g . NMR 25 . NMR
 (d1) :

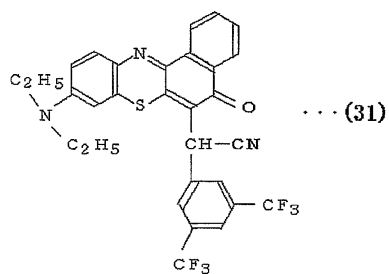
((d1))



(25)

100 Mℓ 가
()
24
0.40 g(1.57 mmol)
135 가 4
25 Mℓ
0.50 g(1.57 mmol), 3,5-
가
5%
가 30
12%
1 H-NMR IR
(31)
26 27
30 mg
:

((31))



(31)

10 mg/ ℓ 가
F-4500
28

()

365 nm

400 nm

800 nm

1200 nm/

5.0 nm

5.0 nm

700 V

28

(26)

< >

2,000 Mℓ 가 10.0 g(31.4 mmol), N- 6.20 g(34.8 mmol), AIBN 0. 20 g 780 Mℓ 가 100 가 , 2.0 , 5.1 g 30 , IR 29 , NMR 204 205 , (18)

31 .

가

, 가 , 가 , 가

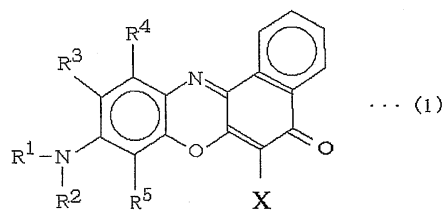
, 가 , 가 , 가

(57)

1.

(1) :

((1))



[, (1) ,

R^1 , R^1 R^3 -CH₂CH₂-CR⁶R⁷-(, -CR⁶ R^7 - , R^6 R^7) ,

R^2 , R^2 R^5 -CH₂CH₂-CR⁸R⁹-(, -C R^8 R^9 - R^8 R^9) ,

R^3 , R^1 R^4

R^4 R^3 ,

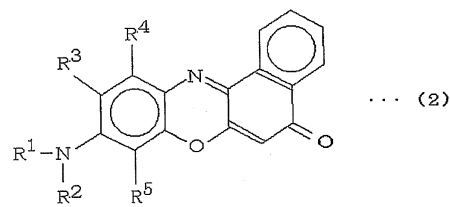
R^5 R^2 ,

X].

2.

(2) , (1)

((2))



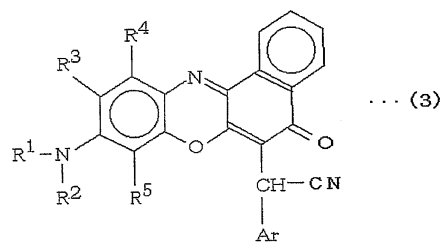
(, (2) ,

R¹, R², R³, R⁴ R⁵ 1).

3.

(3) :

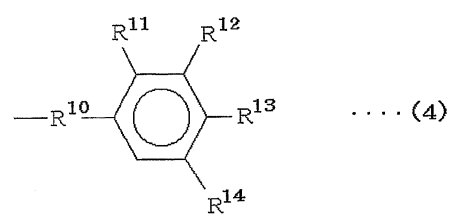
((3))



(, (3) ,

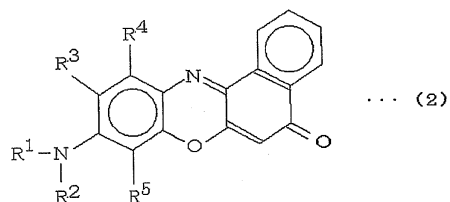
R¹, R², R³, R⁴ R⁵ 1 , Ar (4), (6) (7)

((4))



(, (4) ,

R¹⁰ , R¹¹ R¹² -CF₂-O-CF₂- , R¹³ 1 5 -CF₂-O-CF₂- , R¹⁴ , R¹³ , R¹³ -CF₂-O-



(, (2) ,

R^1, R^2, R^3, R^4, R^5 1),

((8))

$NC-CH_2-Ar$

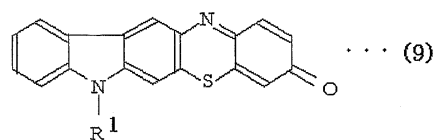
(, (8) , Ar 1).

5.

(9)

:

((9))



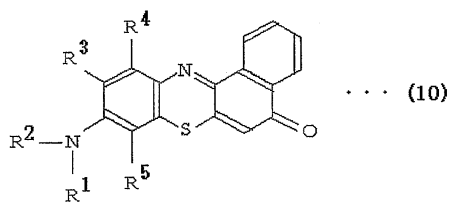
(, (9) , R^1).

6.

(10)

:

((10))



(, (10) , R^1, R^2, R^3, R^4, R^5 1).

7.

4- R^1 (, R^1)

5

8.

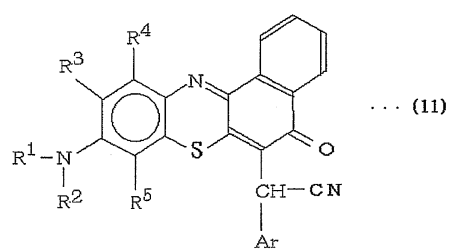
)가 R^1 4- R^2 (, R^1 R^2 1- 6 , .

9.

(11)

:

((11))



(, (11) , R^1, R^2, R^3, R^4, R^5 1 , Ar 2).

10.

(10) $NC-CH_2-Ar(, Ar 2)$ (11)

11.

1 , 3 , 5 , 6 9 1

12.

11 ,

(hole)

13.

12 ,

1 , 3 , 5 , 6 9 1

14.

12 13 ,

15.

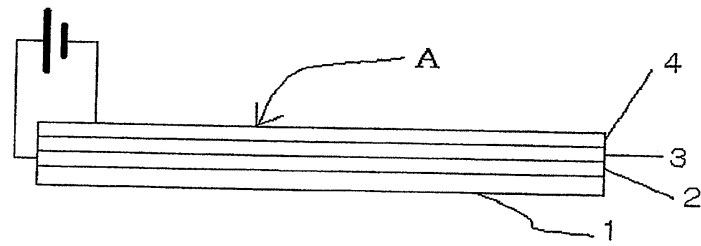
11 ,

1 , 3 , 5 , 6 9 1

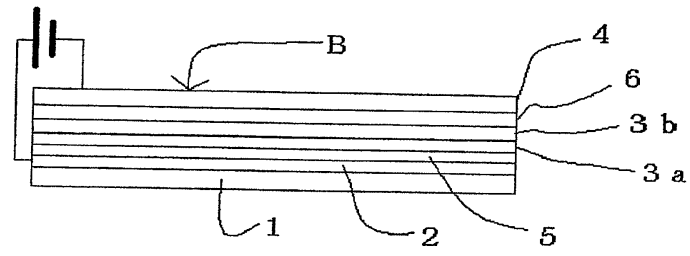
16.

15 ,

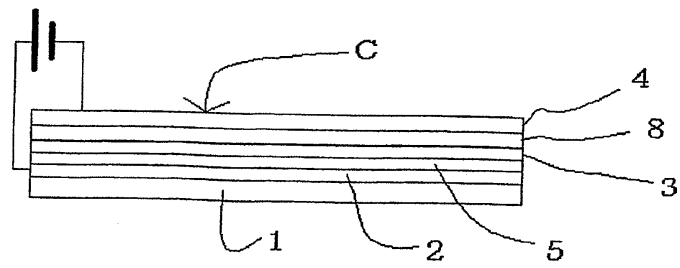
1



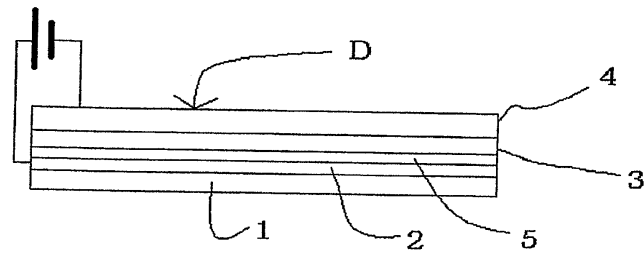
2



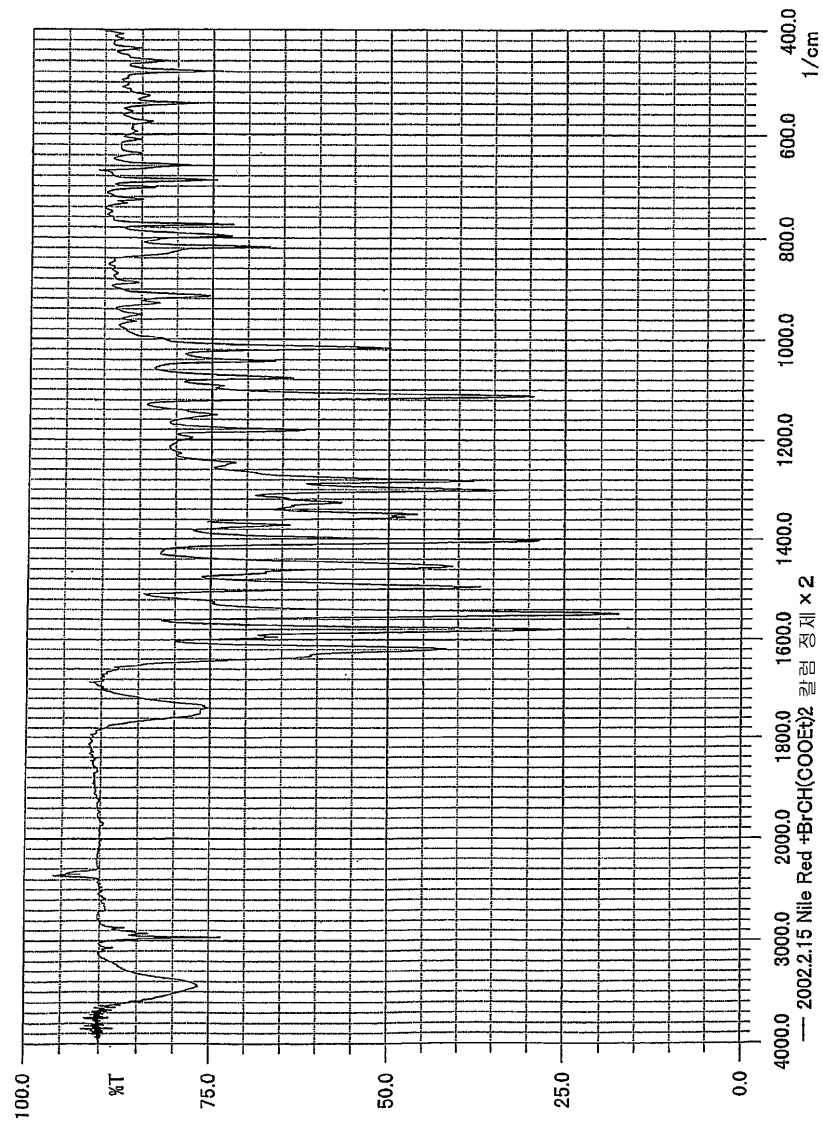
3



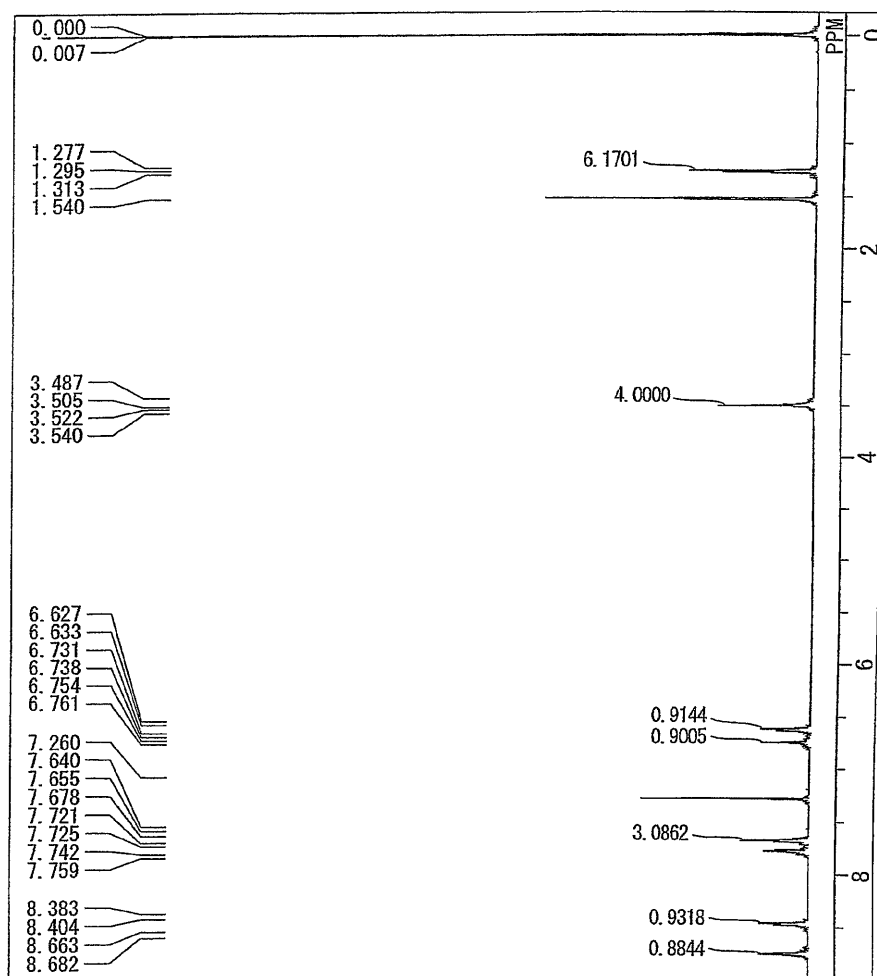
4



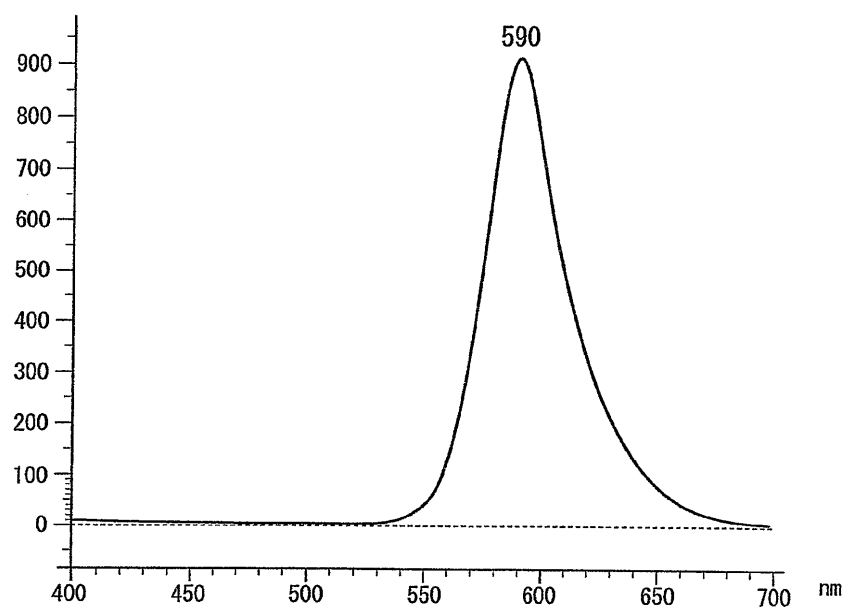
5



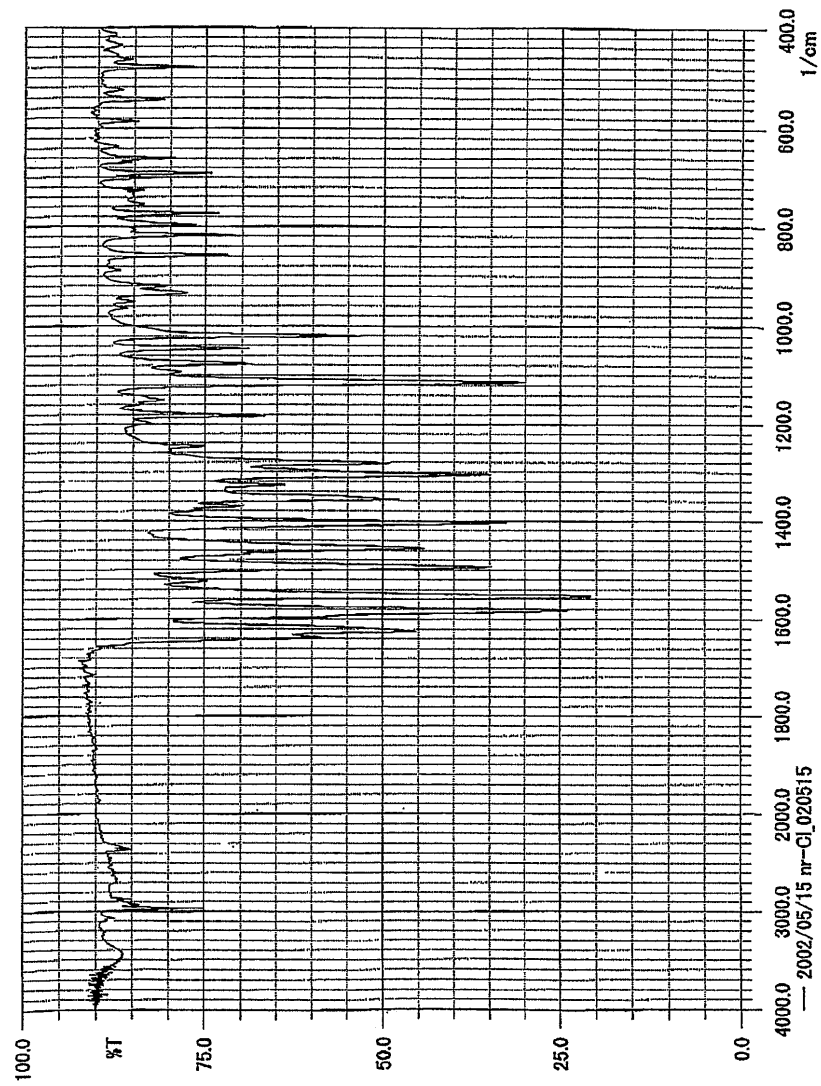
6



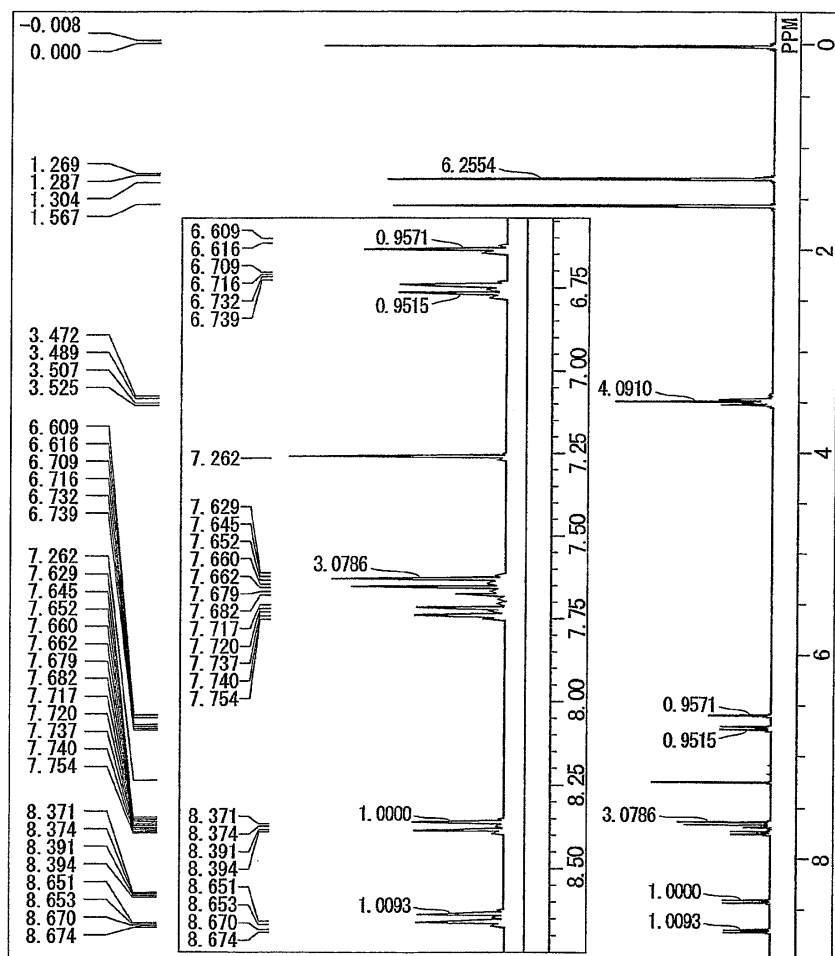
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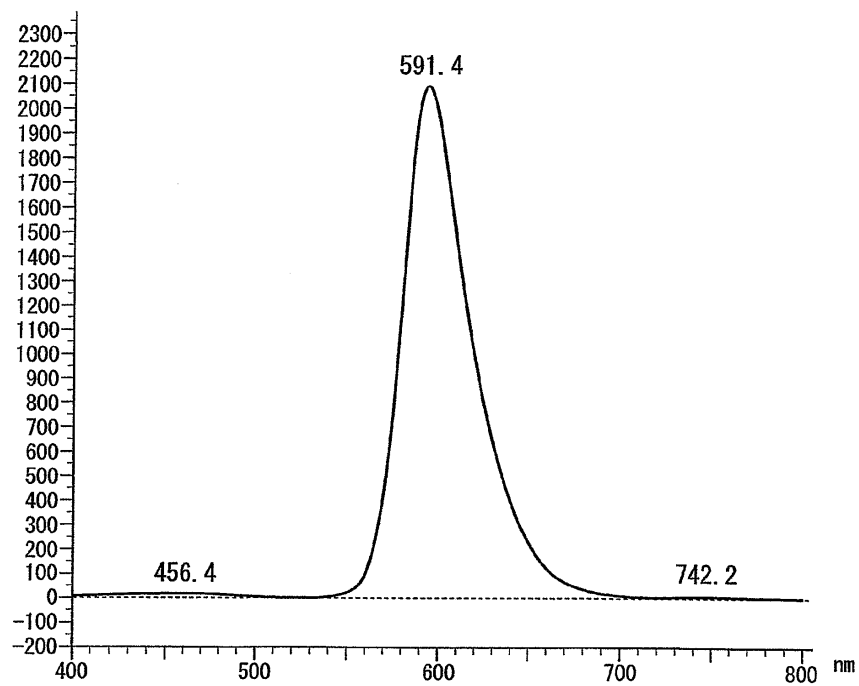
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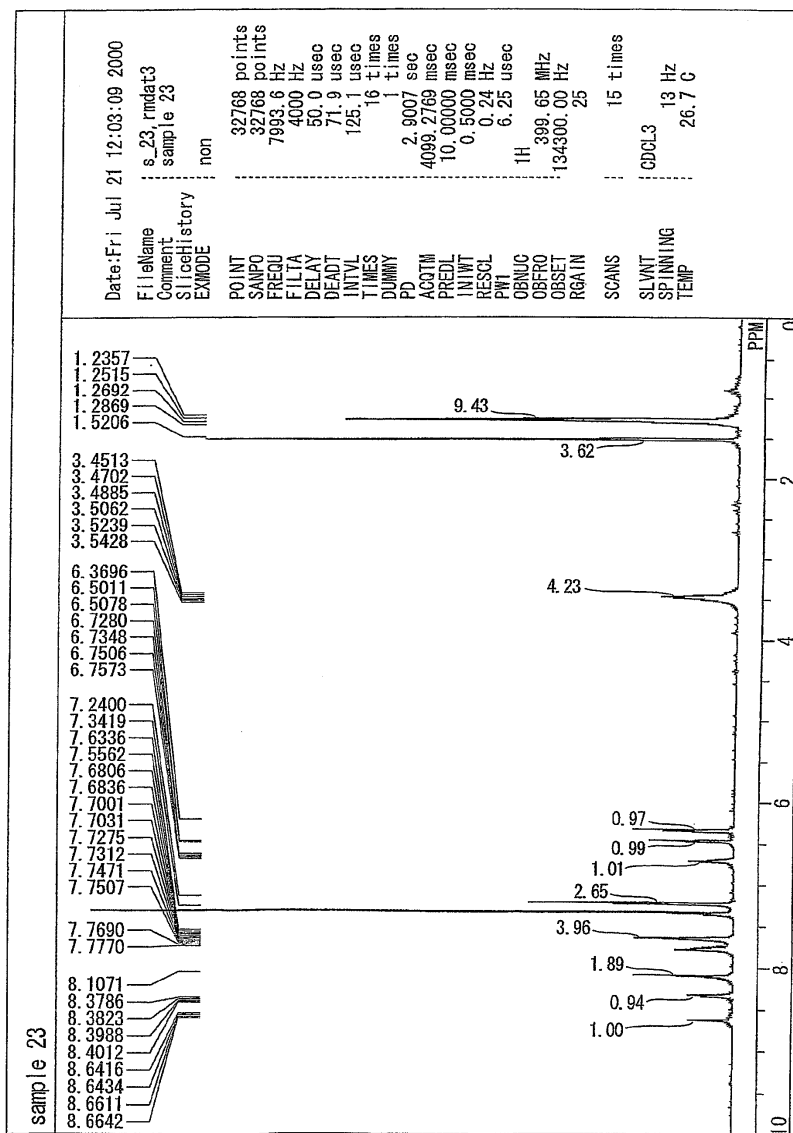
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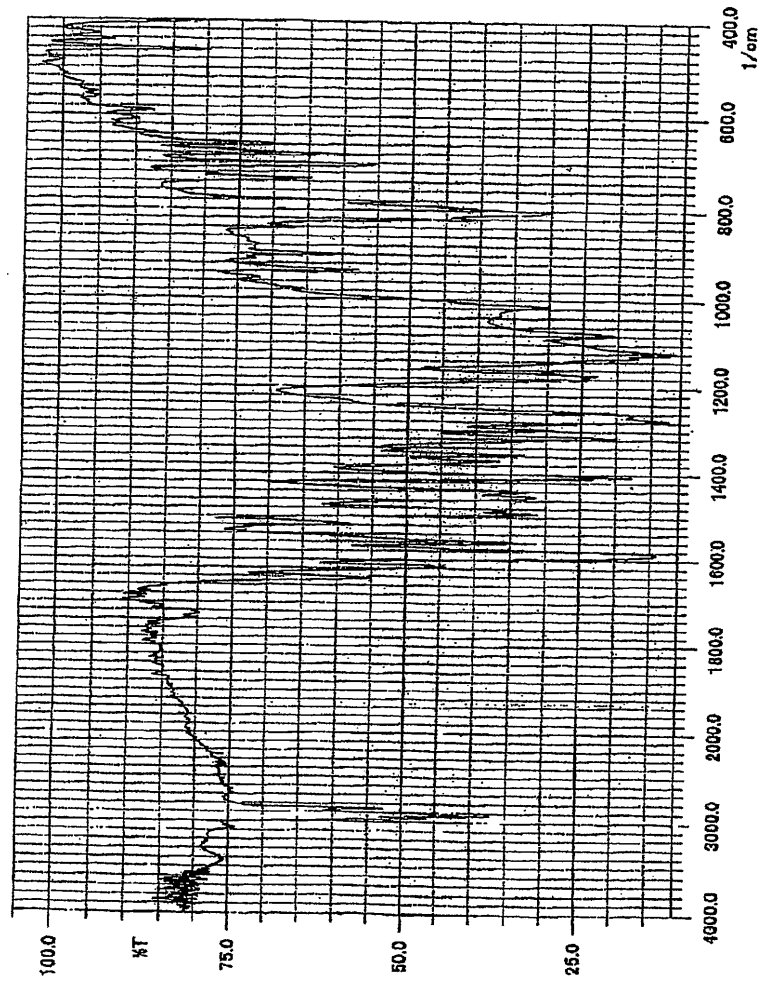
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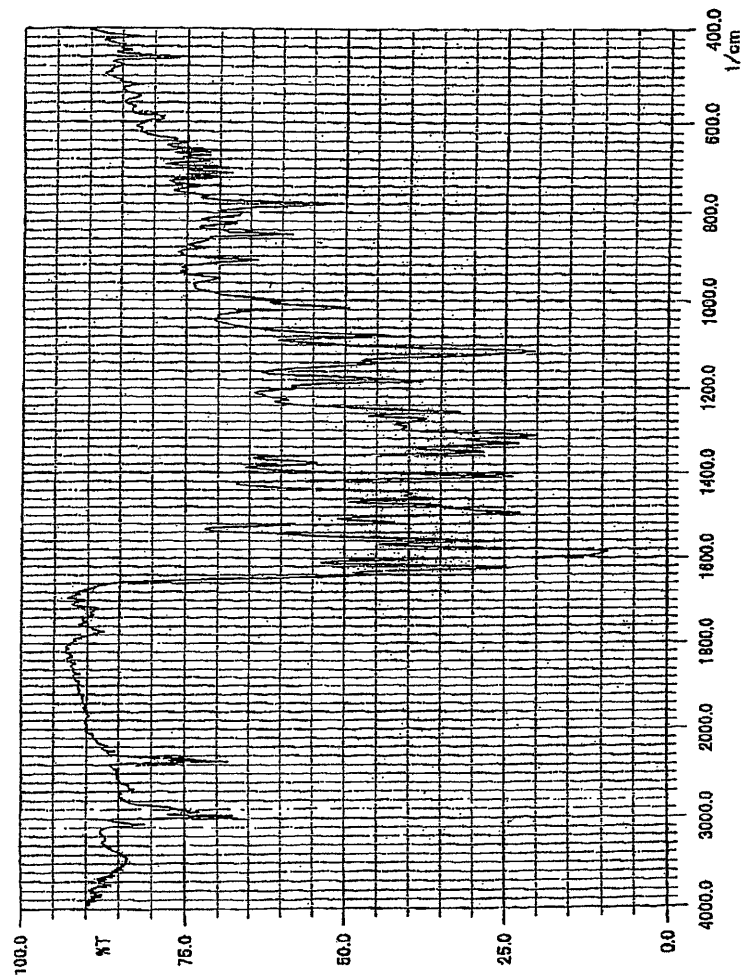
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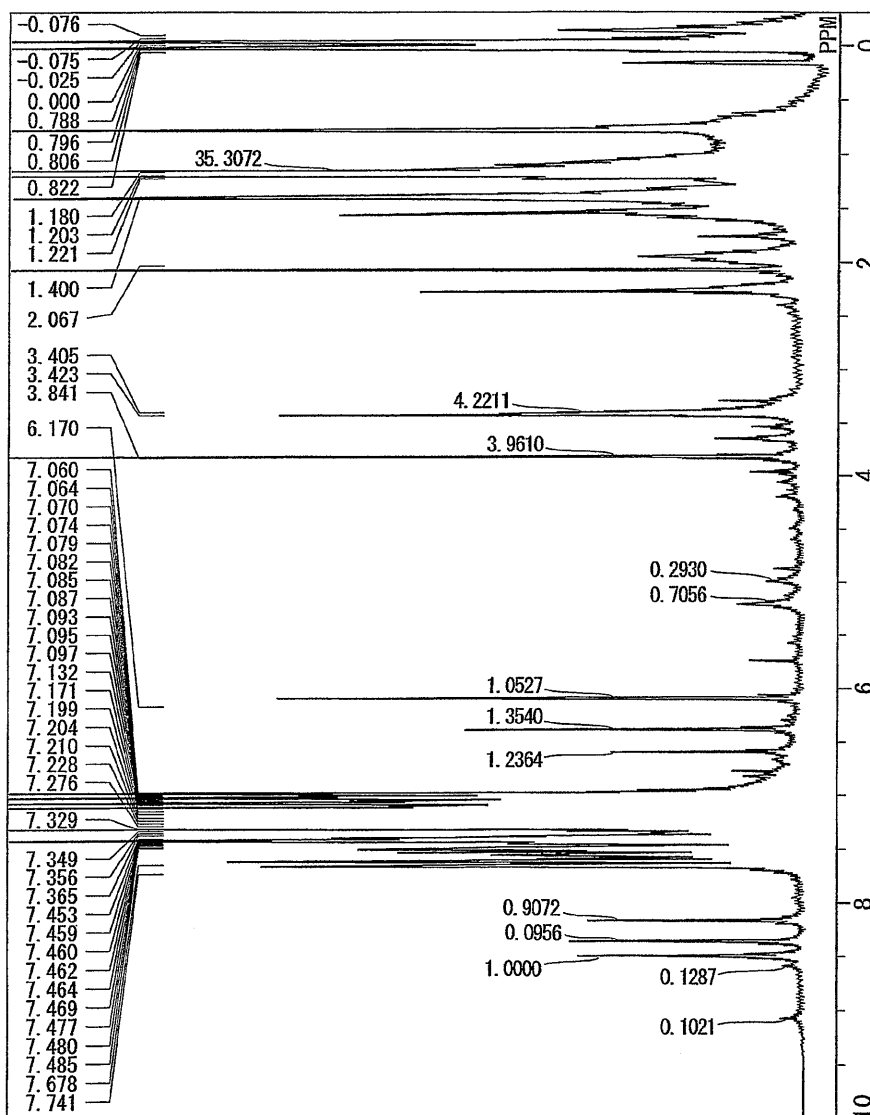
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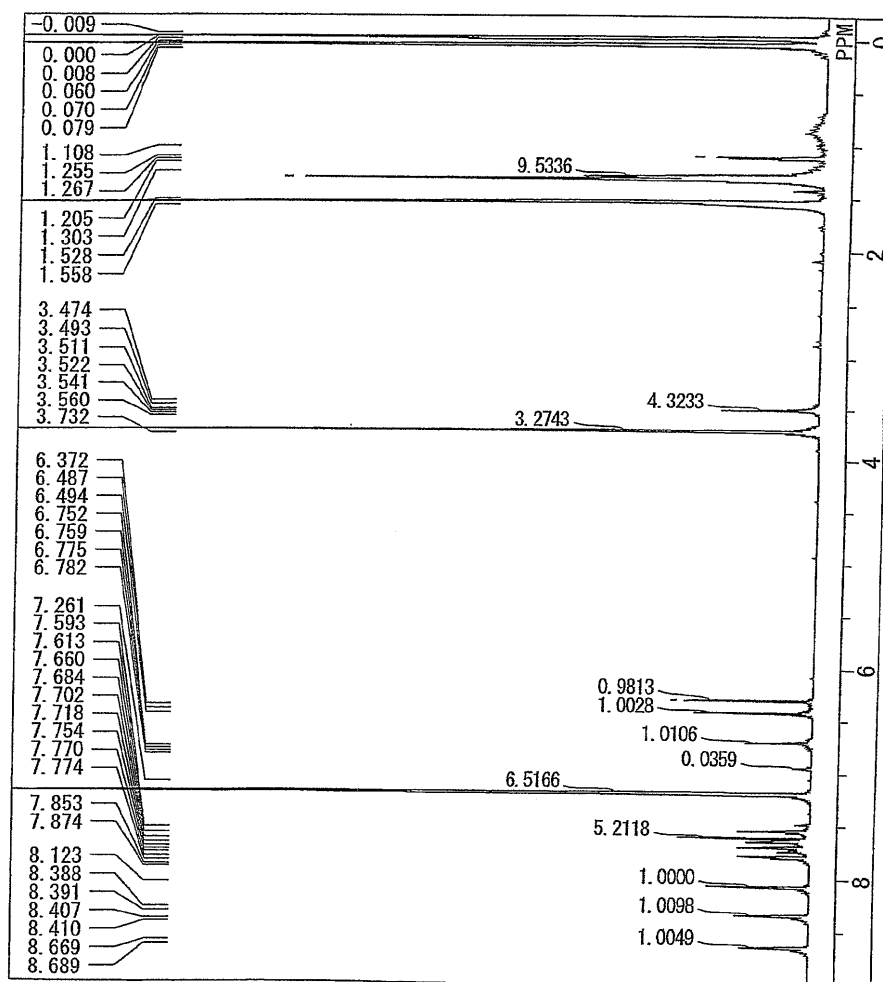
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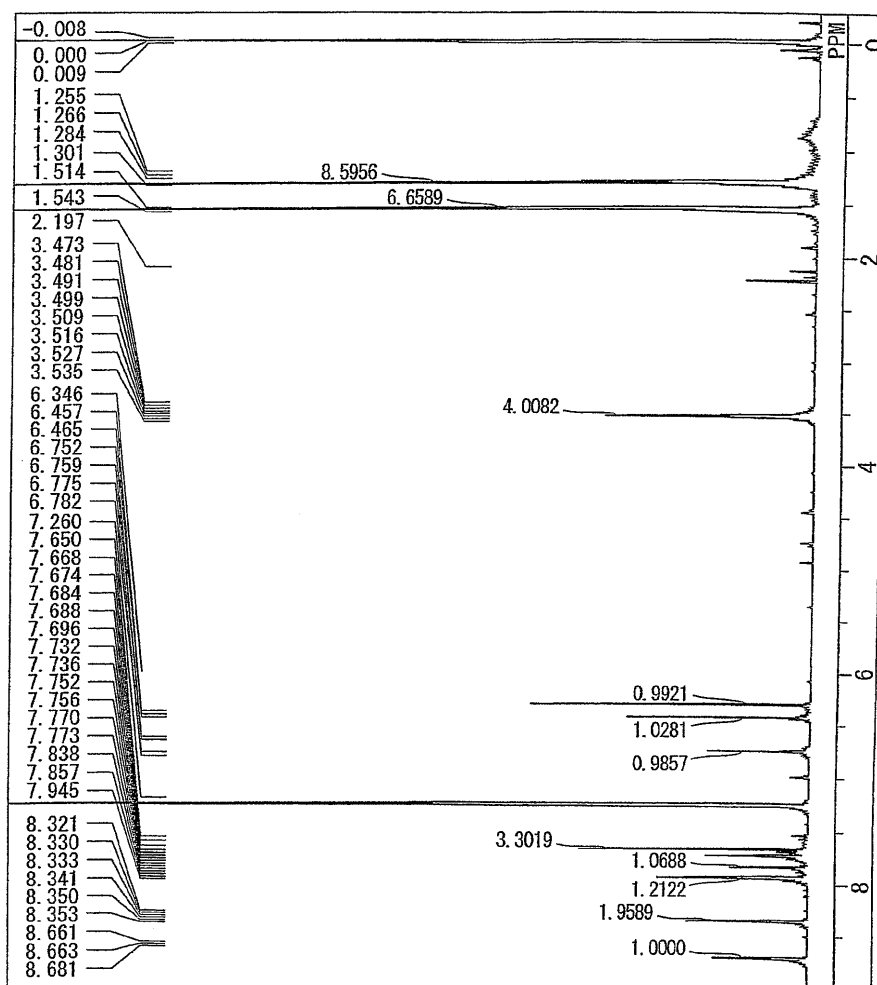
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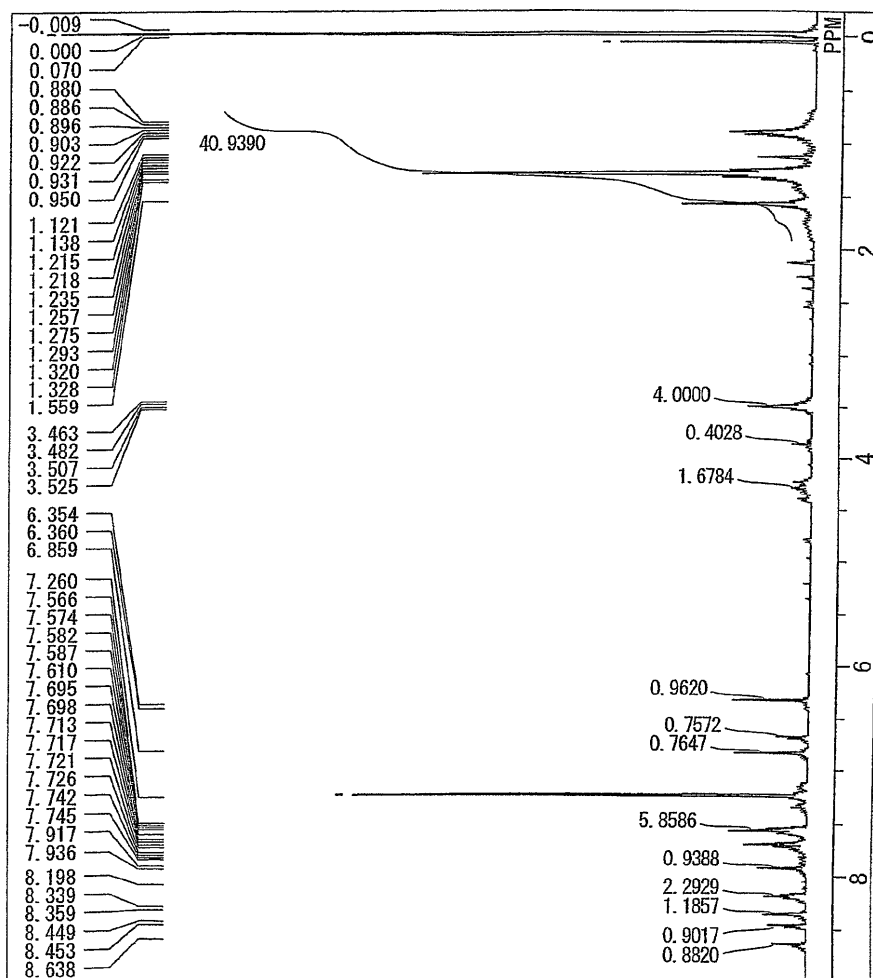
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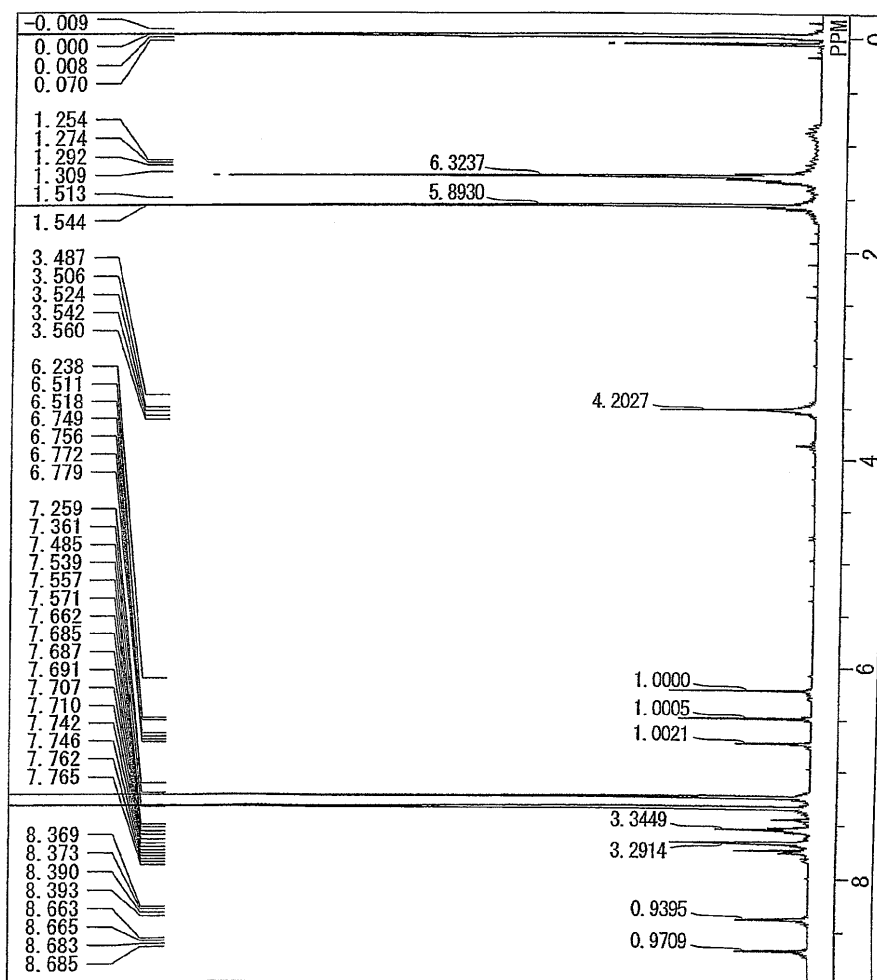
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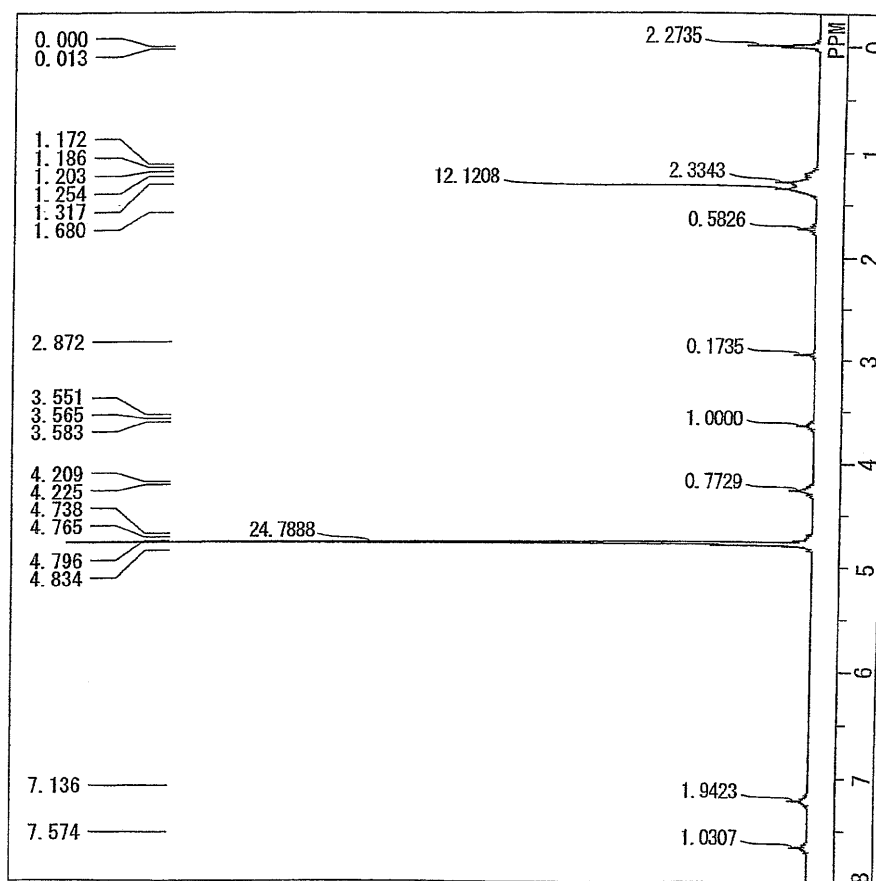
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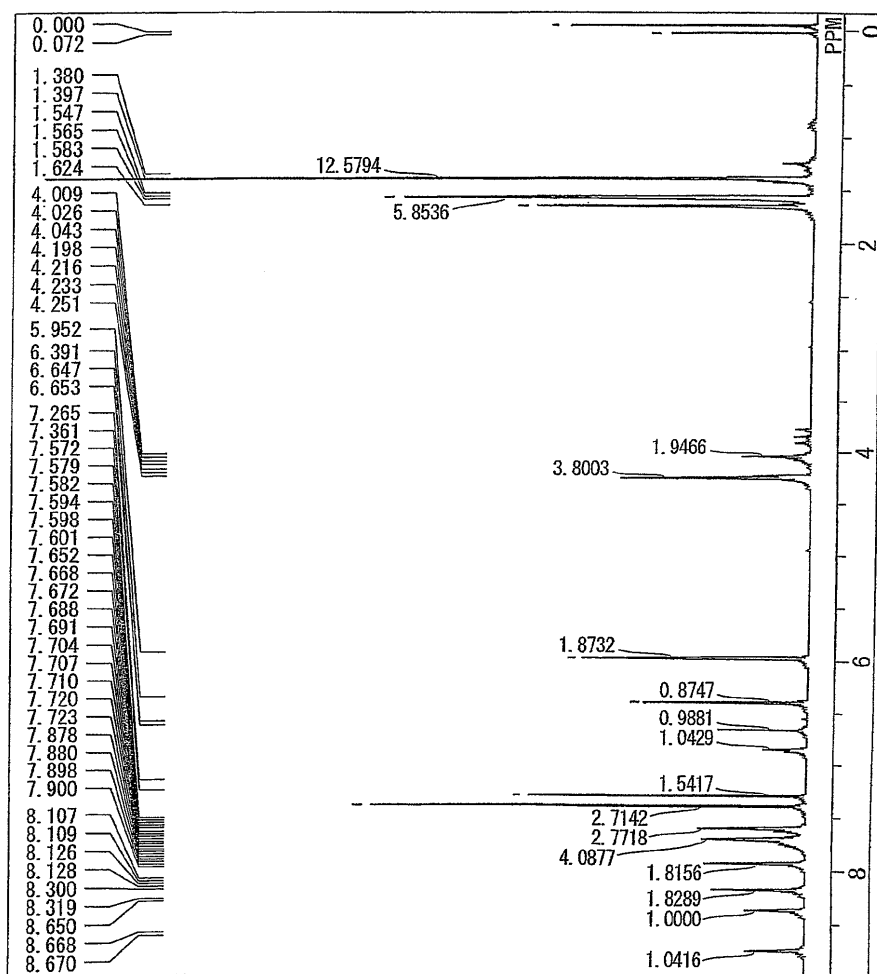
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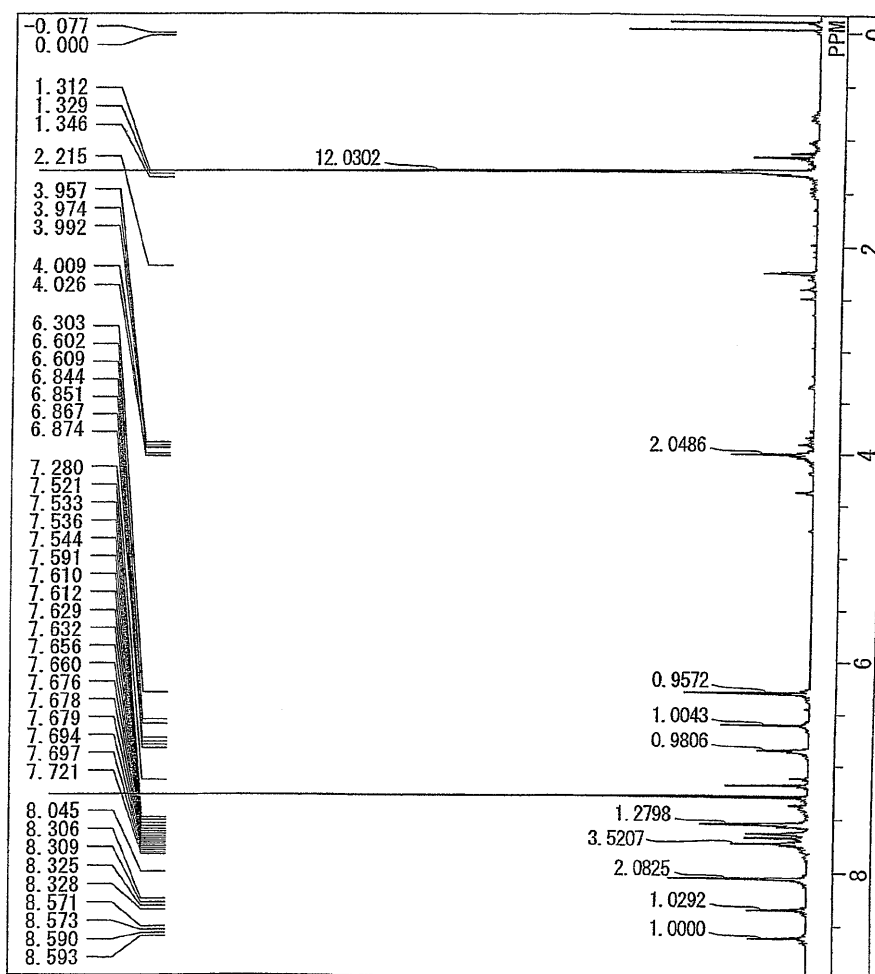
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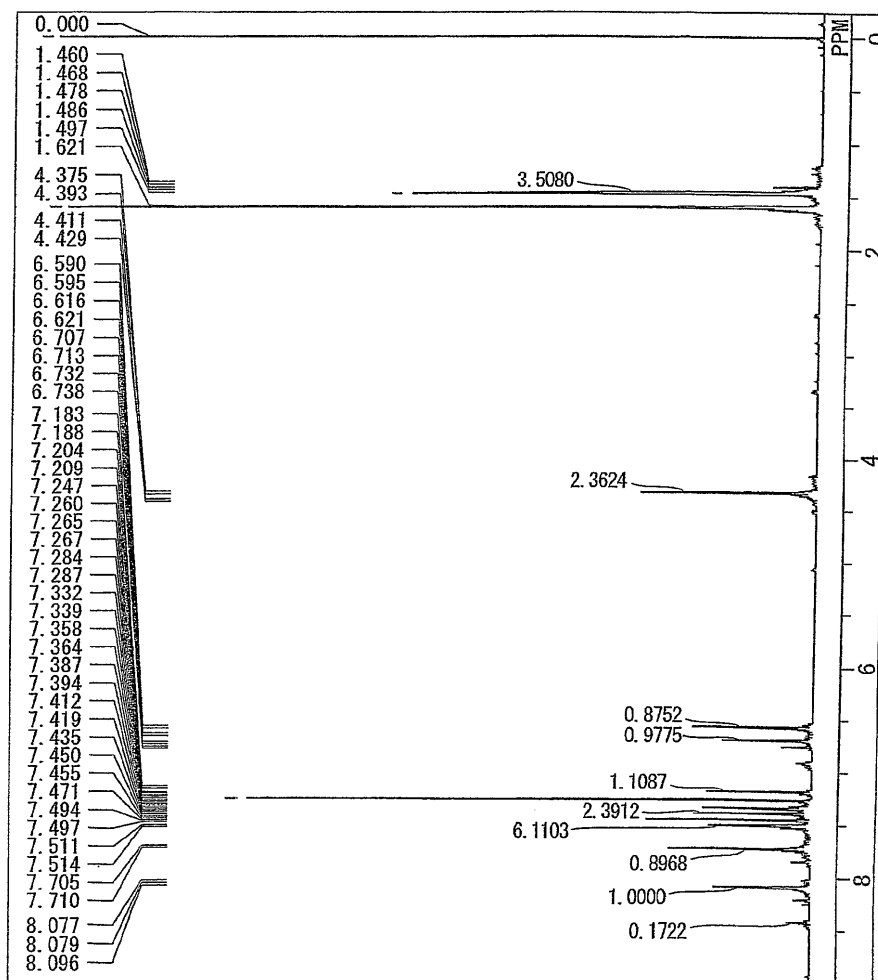
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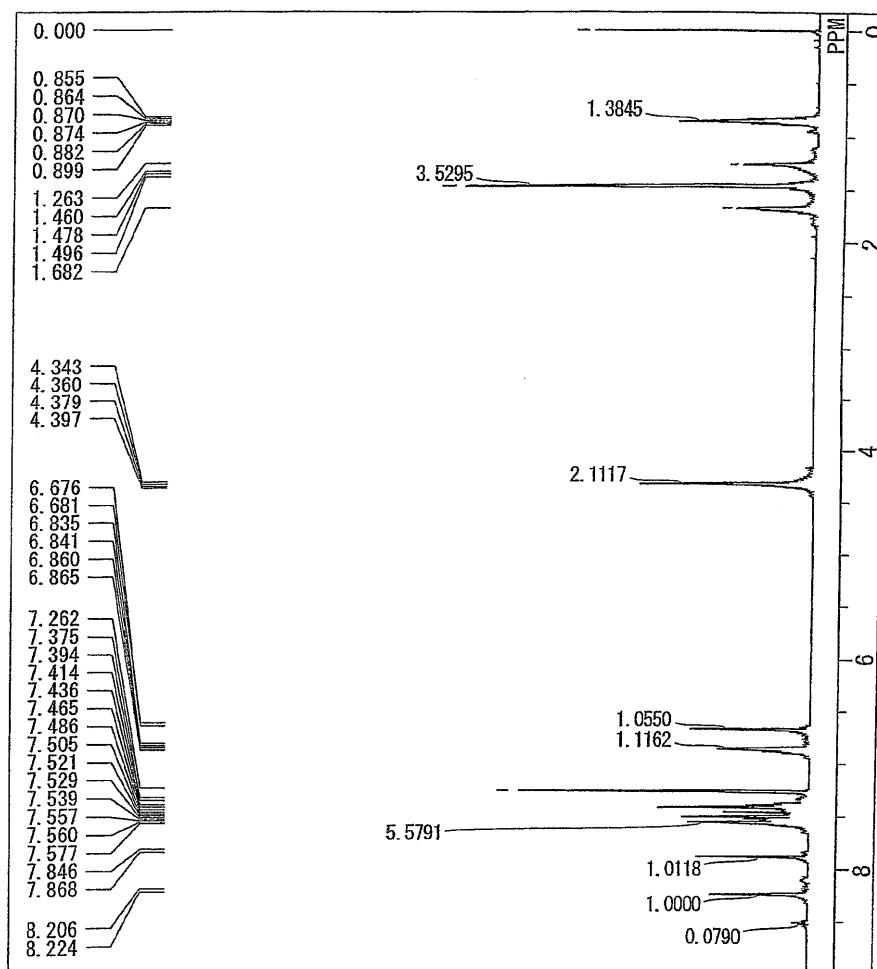
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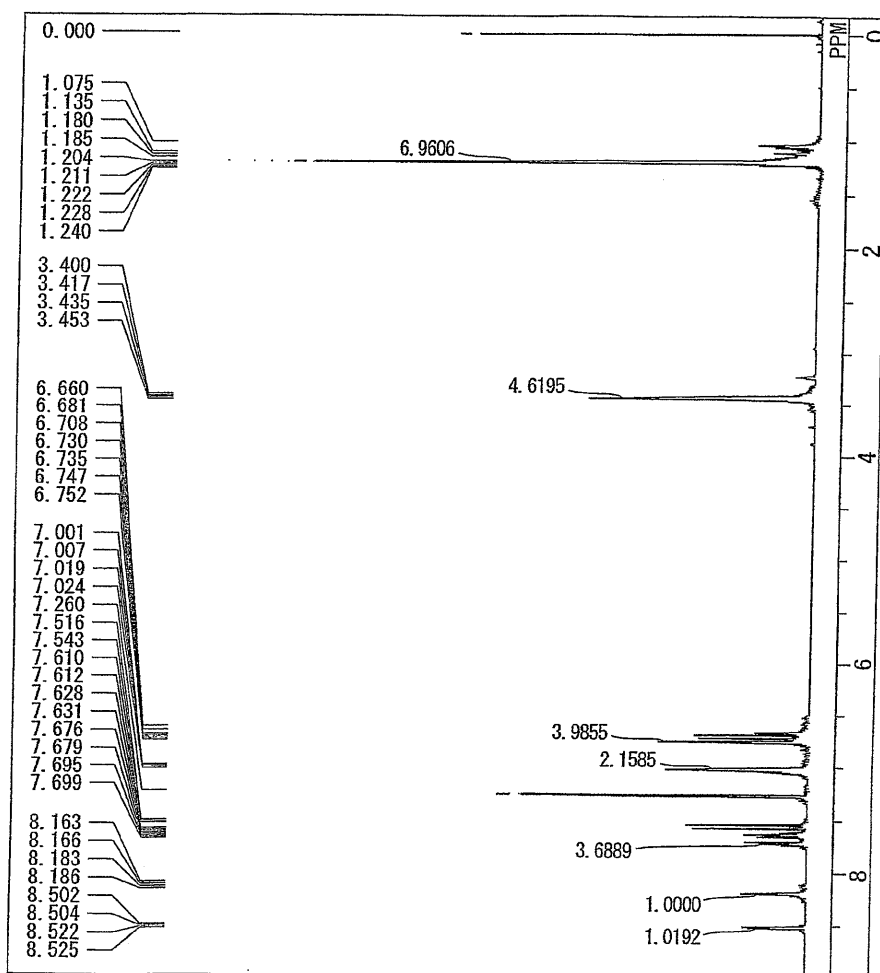
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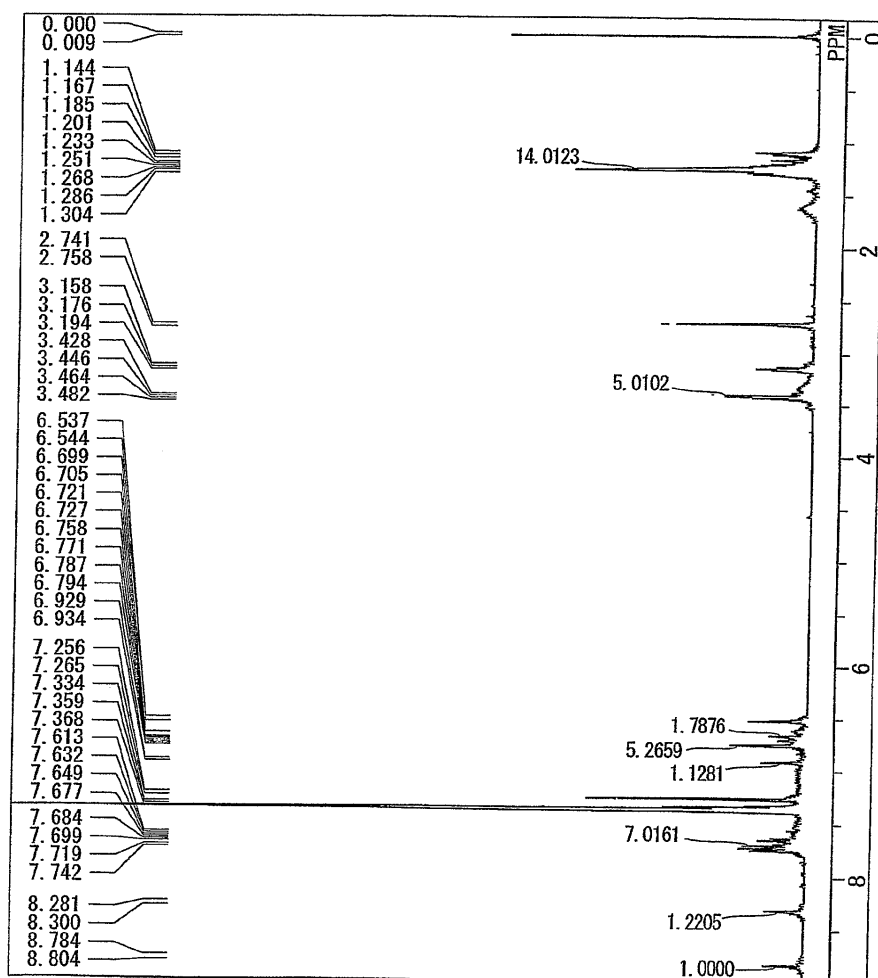
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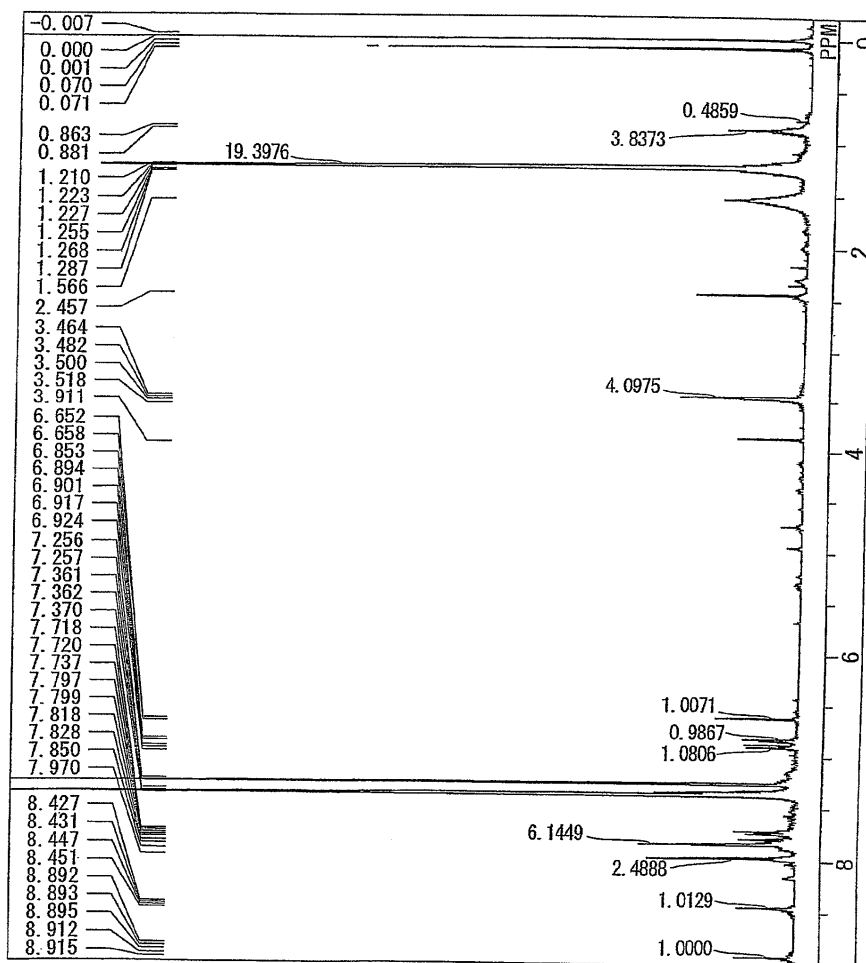
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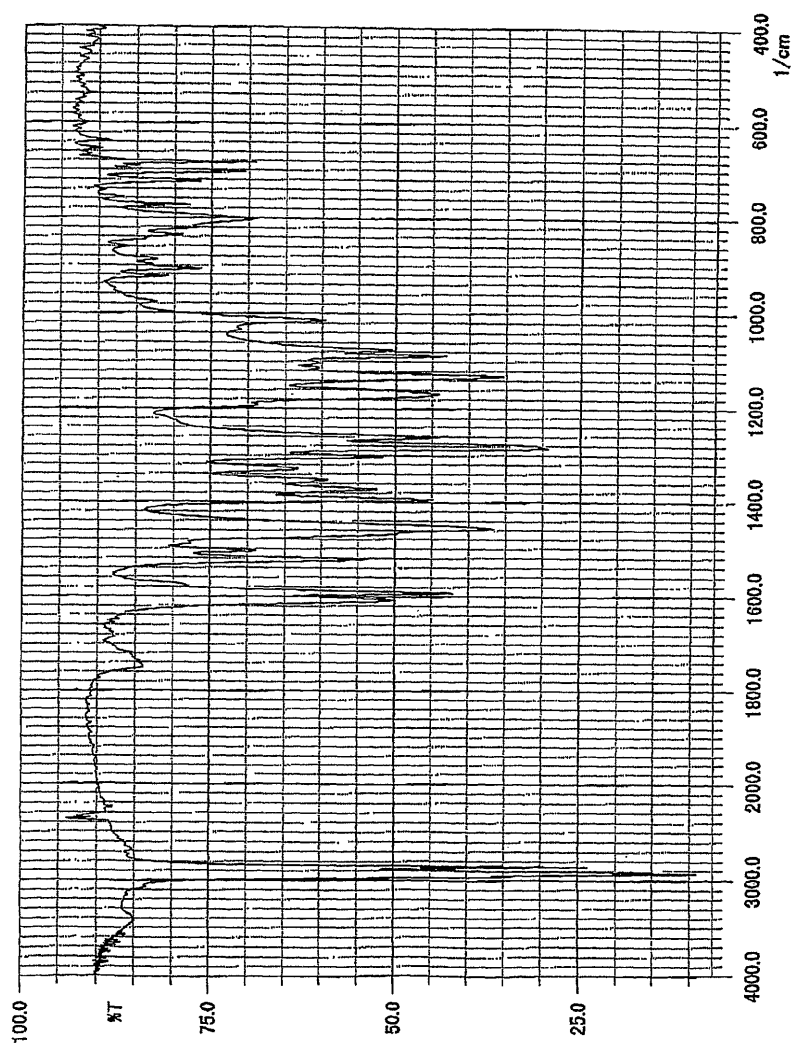
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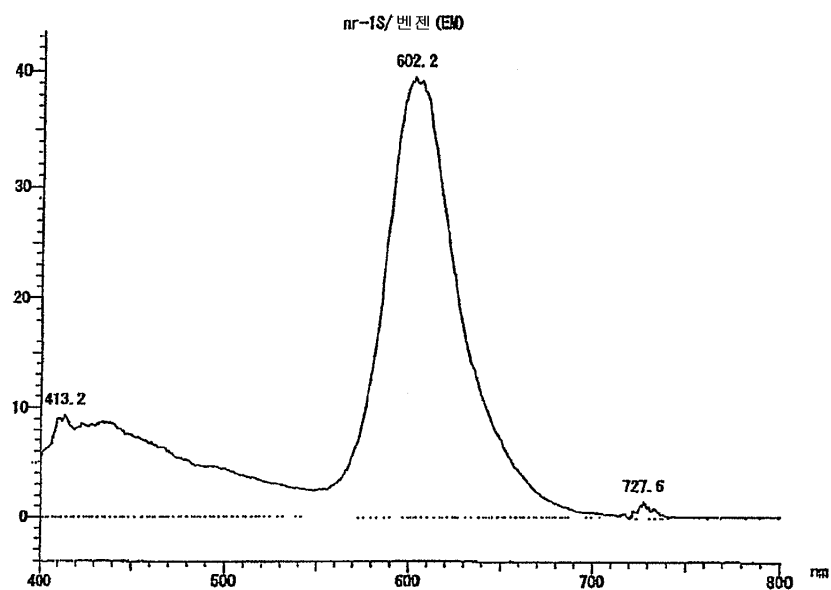


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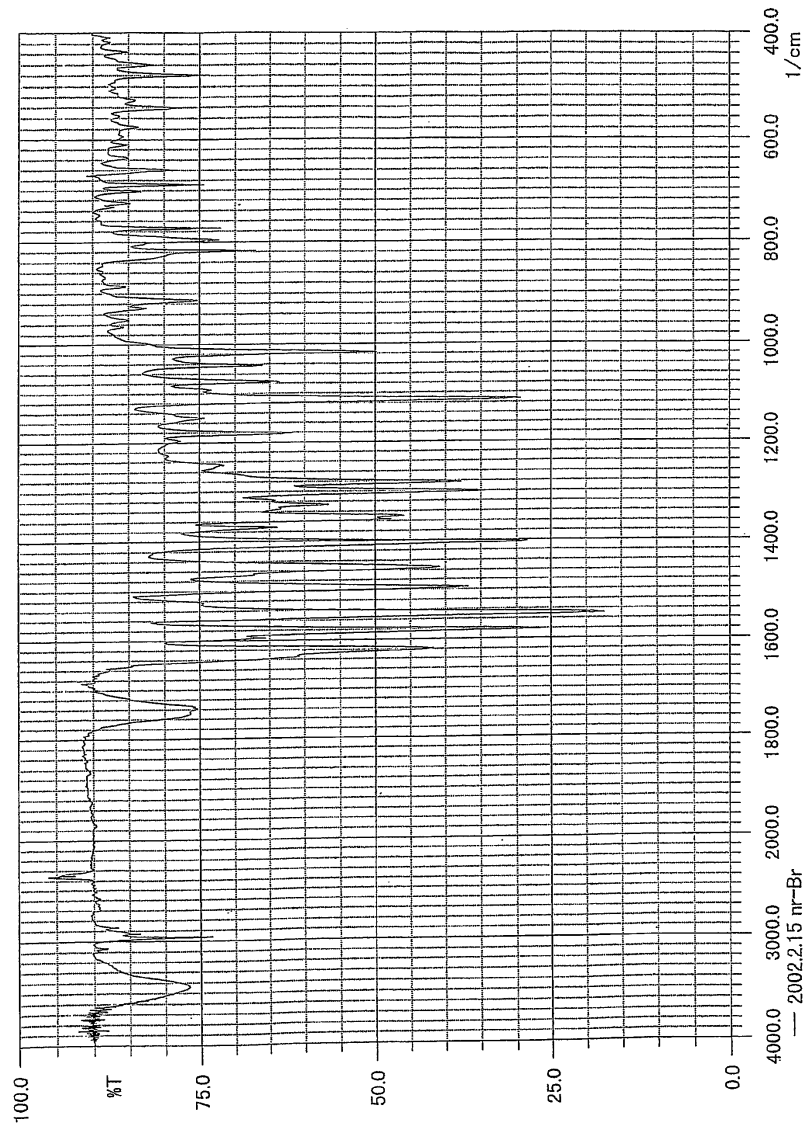


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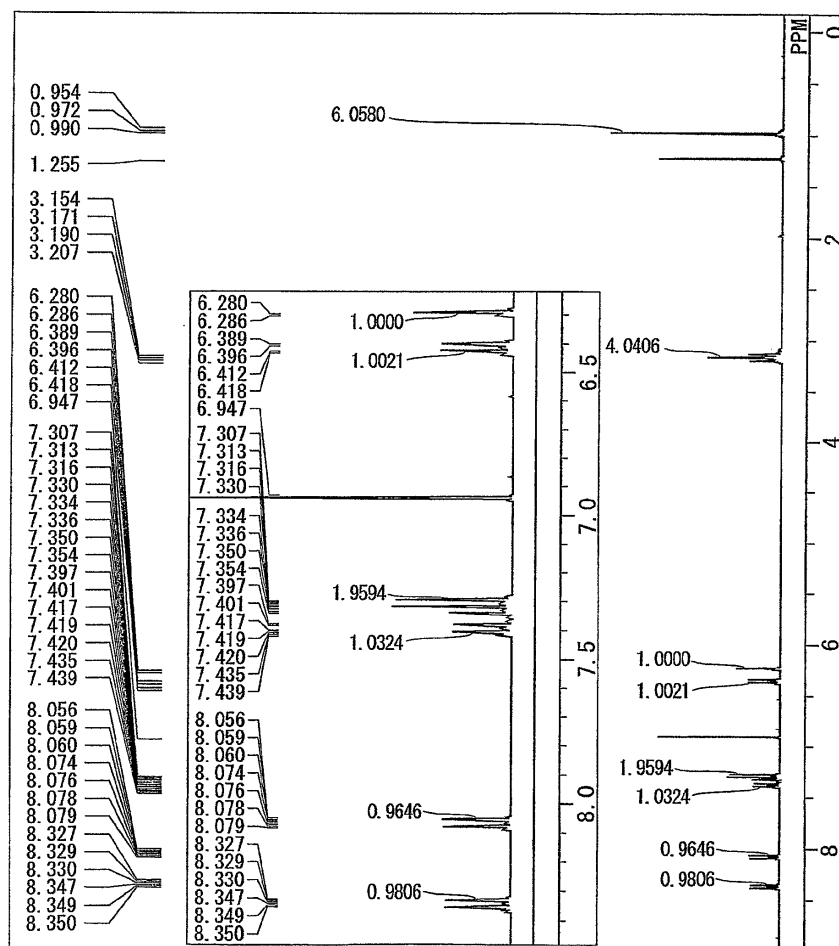
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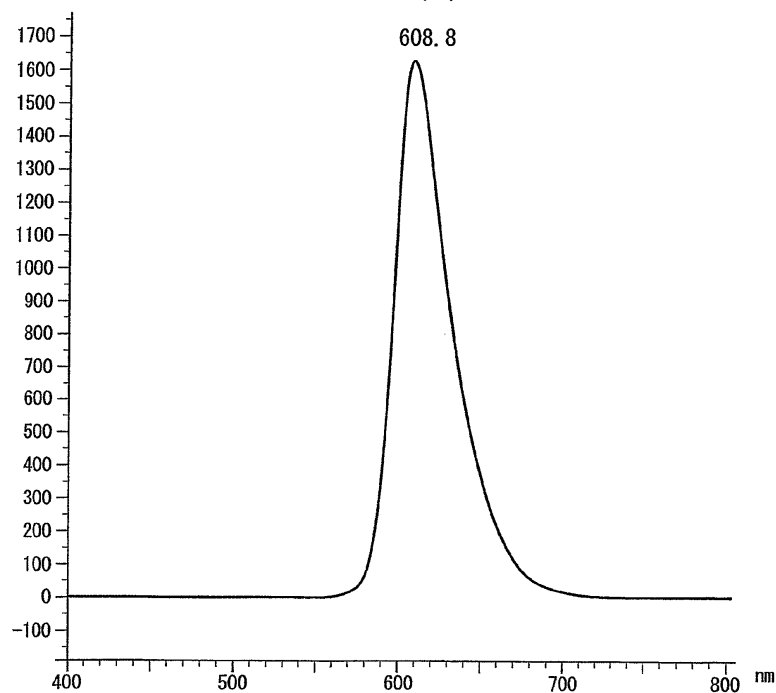


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nr-Br (EM)



专利名称(译)	无红光发光化合物，其制造方法和发光装置		
公开(公告)号	KR1020040083091A	公开(公告)日	2004-09-30
申请号	KR1020047011282	申请日	2003-01-21
申请(专利权)人(译)	地用工程可否让这个夏		
当前申请(专利权)人(译)	地用工程可否让这个夏		
[标]发明人	NAKAYA TADAO 나카야다다오 TAJIMA AKIO 다지마아키오 SAIKAWA TOMOYUKI 사이카와도모유키 TAKANO SHINJI 다카노신지 YAMAUCHI TAKAO 야마우치다카오 MORI HIDEMASA 모리히데마사		
发明人	나카야다다오 다지마아키오 사이카와도모유키 다카노신지 야마우치다카오 모리히데마사		
IPC分类号	H01L51/00 C07D279/36 H01L51/30 C07D413/06 H05B33/14 H01L51/50 C09K11/06 C07D265/34 C07D513/04		
CPC分类号	C09K2211/1011 H01L51/5012 H01L51/0059 H01L51/0071 C07D513/04 C09K2211/1037 C09K2211/1048 C09K2211/1051 C07D413/06 C09K2211/1033 H01L51/0069 C09K11/06 H05B33/14 C07D279/36 C09K2211/1014 H01L51/0081 C07D265/34		
代理人(译)	您是我的专利和法律公司		
优先权	2002012222 2002-01-21 JP 2002012224 2002-01-21 JP 2002014881 2002-01-23 JP 2002172127 2002-06-12 JP		
外部链接	Espacenet		

摘要(译)

本发明的目的是色纯度大。它辐射到高亮度。并且坚固性提供了能够辐射到大的红色荧光化合物和高亮度的发光器件。本发明提供由下列化学式 (1) 表示的镍红红色透明化合物和在发光层中包含该化合物的发光装置:(化学式 (1)) 尼尔红，该化合物，发光器件，有机EL，高亮度，红色。

