

(19)
(12)(KR)
(A)(51) 。 Int. Cl. ⁷
C09K 11/06(11)
(43)2003 - 0029394
2003 04 14(21) 10 - 2001 - 0061881
(22) 2001 10 08

(71)

20 LG

(72)

102 104

501 1302

580

218 - 904

103 1001

107 101

(74)

:

(54)

,

가

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.

1

2

3

4

*

200, 300, 400 : 201, 301, 401 :

202, 302, : 203 :

204, 304, 404 : 205 :

206, 306 : 207, 307, 407 :

(OELED, Organic Electroluminescent Display Device) , ,

, 가 가 ,

(OLED, Organic Electroluminescent Display Device) 1963 , , 가
(Anthracene Single Crystal) (Electroluminescence) ,

PDP , IEEE Spectrum 35(4), 1998 LCD
(40 °) 가 (30 - 60ms) LCD
80 ° 0.01ms (1.0lm/W) (
200V) (200W, 106.7cm) PDP 2 - 16 lm/W
2 - 5V 1W(26.4cm) .

, , TV, , , , , , , ,
, TV 가 .

(가), (가), , , , 가 , .(, pp305 - 3
42 1999, EMDEC)

가
가 (EL, Electroluminescence)
가 가
가 가

가 가 ~ , ~ cd/m^2

가
가 가
(Exciton) ,
가 가

가 가 가 가
PCS(personal communication service) 가 가
가 가 가 가
(flexible) , ,
(contrast) 가
(surface light source) , (Plasma Display Panel)
가 , , , 3가

(full color) 가 , ()
()

가 (color display)
(cathode ray tube), LCD(liquid crystal display) PDP(plasma display panel) (full color) CRT

가 ,

, .

, .

1 (102), (103), 1 (104), (105), (106), (100) (101),
(107)

(100) (101) ITO(Indium Tin Oxide, $\text{In}_2\text{O}_3 + \text{SnO}_3$)가
(101) (102) (Copper(II)
(Phthalocyanine) 10~30nm (102) (103)
, - (- 1 -) , ' - (N,N - di(naphthalen - 1 - yl) - N,N' - diphenylbe
nzidine) 30~60nm

(103) (104) (104)
(8 -) (tris(8 - hydroxyquinolate) aluminum (Alq3)) (104)
(N - methylquinacridone) () , 30~60nm
가 Alq3가

(104) (105) Alq3가 20~50nm ,
(105) (106) (Li₂O) 30~50nm
(106) (107) Al/Li
가 .

, .

, .

, 가 / / / / / /

, .

, ,

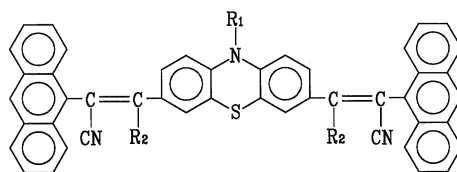
, .

, ,

, 가

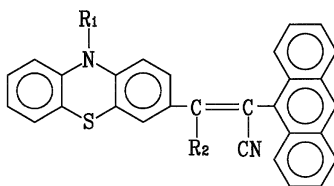
1, 2, 3
가 (π) -
R₁ 1~20, R₂가
(H), (CN)가, R₁가, R₂
(H)
(CN)가

2



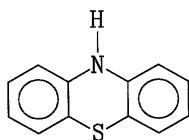
2 R₁, R₂ , (H), (aryl) , (hetroyaryl) ,
(halogen) , 가 1~20 .

3



3 R₁, R₂ (H), (aryl), (heteroaryl),
(halogen), 가 1~20
1, 2 3 (Arbuzov) - (Honer - Emmons)
(Knoevenage)
1
4 (phenothiazine) 5
6 (dimethyl formamide), 6 (phosphorus oxychloride)
7

4

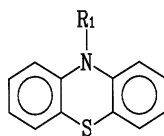


5



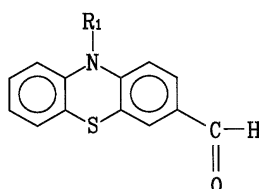
5 R₁ (H), (aryl), (heteroaryl), (halogen), 가 1~20
, X F, Cl, Br, I

6



6 R₁ (H), (aryl), (heteroaryl), (halogen), 가 1~20

7



7 R₁ (H), (aryl), (heteroaryl), (halogen), 가 1~20

, 1, 2 3 R₁ (H) 4 5
(phosphorusoxy chloride) (dimethyl formamide)
7
4 5 6 (dimethyl
sulfoxide), (dimethyl formamide), (alcohol) 1 ,
(dimethyl sulfoxide) .

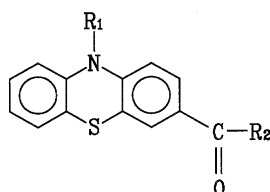
6 1 , , , , ,
1 mol 1.5~2 mole 6
가 (dimethyl formamide) 6 (phosphoryl chloride)
(dimethyl formamide) 7 1,2 - (1,2 - d
(phosphoryl chloride) (dimethyl formam
ichloroethane) ,
ide)가 .

7 6 1 mole 1~2 mole (di
methyl formamide) (phosphoryl chloride) 7
가 1 2 6 1mole 8~10 mole (dimethyl formamide)
dimethyl formamide) (phosphoryl chloride) .

7 (Azobisisobutyronitrile)
(SOCl₂), (tertiary butoxy chloride), -
(N - bromosuccinimide)

[illegible]

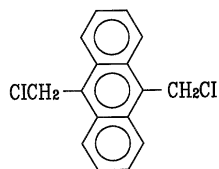
8



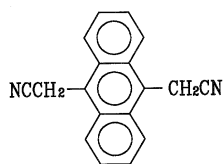
8 R₁, R₂ , (H), (aryl) , (hetroyl) ,
(halogen) , 가 1~20 .

8, 1가
9가가
(methyl isobutyl ketone) 267ml, 133ml, 67ml,
(potassium cyanide 97%) 50g, (cuprous cyanide) 0.4g 가
9, 9,10 - () (9,10 - bis(chloromet
hyl)anthracene) 17g 2 8 가 8 가 10
(dimethyl formamide) 336
10

9



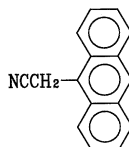
10



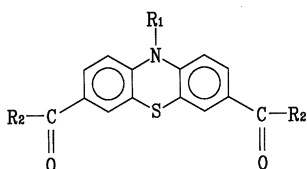
8 10 가
1 10 9,10 - (9,10 - anthracenediacetonitrile)
(tetrahydrofurane) 가 60
(tetrabutylammonium hydroxide) 가 5
(50) 1 가
1 2
2 3 2 3 9
11 (ClCH₂ - anthracene)

10

11



12



2 가 2 12
12 R₁, R₂ (H), (aryl), (heteroaryl),
(halogen), 가 1~20

, 6 2
 mole 8~10 mole 가 2 (dimethyl formamide) , 6 1
 (phosphoryl chloride)
 henothiazine)) 가 2 (- (- 3,6 -) (N - (aryl - 3,6 - diformylp
 (- (- 3,6 -
) (N - (aryl - 3,6 - diformylphenothiazine)) (azobisi
 sobutyronitrile) (SOCl₂),
 (tertiary butoxy chloride) - (N - bromosuccinimide)
 (, ,) (, ,)
 , , ,), (, ,)
 .

2 11 12 10 1

3 8 11 1 2

가

2 3

1

2 (202), (203), 2 (204), (205), (200) (201), (206), (207)

ITO(Indium Tin Oxide, $\text{In}_2\text{O}_3 + \text{SnO}_3$) IZO(Indium Zinc Oxide, $\text{In}_2\text{O}_3 + \text{ZnO}$)
er(II) Phthalocyanine
N,N' - di(naphthalen - 1 - yl)N,N' - diphenylbenzidine

(203) (204) (204)

1, 2 3

1, 2 3

(204) (8 -) (tris(8 - hydroxyquinolate) aluminum (Al

q3)) 1, 2 3 , 30~60nm

(204)	Alq3	(204)
(205)	.	(205)
)- 5 - (4 -	)- 1,3,4 -	2 - (4 -
oxadiazole)	(oxadiazole)	(2 - (4 - biphenyl) - 5 - (4 - tert - butylphenyl) - 1,3,4 - o (oxatriazole) 가

(205) (206) (206) (C)
s, Rb, K, Na, Li) (Li₂O)가 , (206)
Ma/Ag, Al, Al/Li, Al/Nd . (206)

, (204) 1, 2 3
. , 1, 2 3 가
가
. , 가
, ,
.

, (205) (202) (204)
, 가 가 (204)
, 가 가 .
,

, 1, 2 3
(exciplex; excited charge transfer complex) 가 . ,
1, 2 3
, , 가 가
, 가 .

1, 2 3
가
, 가 , ,
가 , ,
1 1 645nm 가 612nm
1

, 1, 2 3 가
(645nm) , 6~8 lm/W , 1000~1800 cd/m²
.

, 3 가
(306)/ (307)) . 3 ((301)/ (302)/ (304)/
. , 3 2
,

, 4 , ((401)/ (404)/ (407)) ,
. , 4 2
.

ITO, 1 (copper(II) phthalocyanine) 2 30nm, (202) (203) (N,N - di(naphthalen - 1 - yl)N,N' - diphenylbenzidine) 50nm (204) 1 30nm (204) (205) Alq3 40nm (205) (206) Li₂O 25nm (206) (207) Mg, Ag 100nm ITO 645nm 18 00cd/m², 8.1 lm/W

ITO / 1400cd /m² 7.2 lm/W /Mg,Ag Photoresearch PR - 650 645nm

1 2 3 ITO, Mg,Ag R₁, R₂ Photoresearch PR - 650 550~690nm 1100~1800cd/m² 6.5~9.3 lm/W 1 Alq3 642nm 1900cd/m², 8.9 lm/W

가 .

1, 2 3 () 1000cd/m² 7 lm/W 가

가

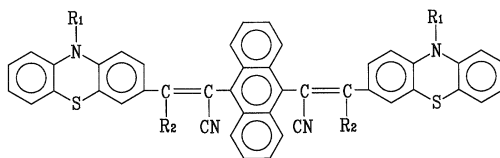
(57)

1.

가

1

1



(,

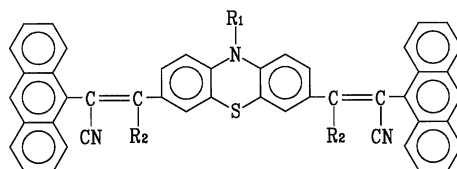
R_1, R_2 (H), (aryl) , (heteroaryl) , (halogen) , 가 1~20 .)

2.

가

2

2



(,

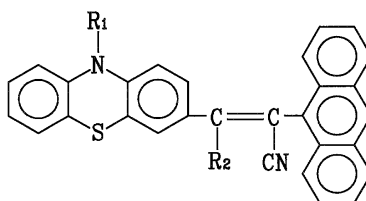
R_1, R_2 (H), (aryl) , (heteroaryl) , (halogen) , 가 1~20 .)

3.

가

3

3



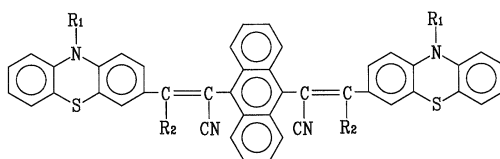
(,

R_1, R_2 (H), (aryl) , (heteroaryl) , (halogen) , 가 1~20
.)

4.

2 , , 3 , 1,

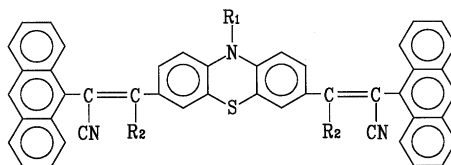
1



(,

R_1, R_2 (H), (aryl) , (heteroaryl) , (halogen) , 가 1~20
.)

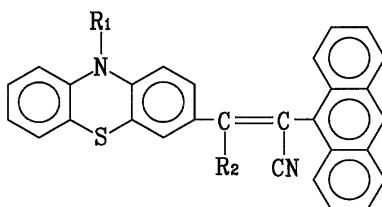
2



(,

R_1, R_2 (H), (aryl) , (heteroaryl) , (halogen) , 가 1~20
.)

3



(,

R_1, R_2 (H), (aryl) , (heteroaryl) , (halogen) , 가 1~20 .)

5.

4 , , , .

6.

4 , , , , , .

1

음 극	107
전자 주입층	106
전자 수송층	105
유기 발광층	104
정공 수송층	103
정공 주입층	102
양 극	101
투명기판	100

2

음 극	207
전자 주입층	206
전자 수송층	205
유기 발광층	204
정공 수송층	203
정공 주입층	202
양 극	201
투명기판	200

3

음 극	307
전자 주입층	306
유기 발광층	304
정공 주입층	302
양 극	301
투명기판	300

4

음 극	407
유기 발광층	404
양 극	401
투명기판	400

专利名称(译)	红色有机电致发光材料和使用其的有机电致发光器件		
公开(公告)号	KR1020030029394A	公开(公告)日	2003-04-14
申请号	KR1020010061881	申请日	2001-10-08
申请(专利权)人(译)	LG电子公司		
当前申请(专利权)人(译)	LG电子公司		
[标]发明人	HAN YOONSOO 한윤수 KIM KIDONG 김기동 KIM SANGDAE 김상대 JUNG JAEHOON 정재훈 PARK HYOUNGGUEN 박형근		
发明人	한윤수 김기동 김상대 정재훈 박형근		
IPC分类号	C09K11/06		
CPC分类号	C09K11/06 C09K2211/1011 C09K2211/1037 H01L51/0052 H01L51/0071 H01L51/5012 H01L51/5048 H01L51/5088 H01L2251/308 H05B33/14 Y10S428/917		
代理人(译)	金勇 新昌		
其他公开文献	KR100587291B1		
外部链接	Espacenet		

摘要(译)

使用本发明的红色有机发光材料和红色有机发光材料的电致发光器件在电场下同时提供具有空穴传输性，电子传输性和红色发光性的有机发光材料，由此提供具有高效率，高亮度和优异色纯度的红色有机电致发光器件，与使用常规发光材料的情况不同。 2 指数方面 有机电致发光器件，有机发光层，红光发射，空穴，电子，高亮度，高效率 - 1 -

음극	207
전자주입층	206
전자수송층	205
유기발광층	204
정공수송층	203
정공주입층	202
양극	201
투명기판	200