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(73) 373-1

(72) 108 306

106 102

(74)

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(54)

EL ; ; EL ; EL ;
EL ; / EL ;
가 가 (leaky wave) 가
가 가 가

2

1 ;
2 6 .

< >
 10: 20:
 30: 35:
 40: 50:

(Organic light-emitting device)

1 (20), (hole conduction layer, 30), (electron conduction layer, 40), (10)
 (cathode layer, 50) (10)
 (50) Mg-Al (20) ITO (Indium-Tin-Oxide layer) (30) (40)
 EL (TPD) (Alq3) (PEDOT)가 N,N'-N,N'-(3-)-4,4'-(8-)
 TO)=1.8, n(TPD)=1.76, n(Alq3)=1,7 n() = 1.46, n(I
 1 (30)/ (40) (35, ' ') 가 (20) 가 ,
 (active area, 35) (30)/ (20) (2) (30)/ (20)
 0)/ (10) . n(Alq3)=1,7 n(ITO) = 1.8 (20)
 (20) (30) , (30)/ (20)
 , n(ITO)=1.8 n() = 1.46 , (10) (20)
 (10) 가 . n() = 1.46 n(
)=1 (10)/ (10) , c (10)/
 cc (20)/ (10) , c (10)/
 (10) , o c가 (10) 가 .
 (isotropic) 가 가 $\int_{\theta=0}^{\theta=\infty} T_{\text{유리}}(\theta) \sin\theta \, d\theta$ 31.5%가 .
 , T () (10) , (20)
 가 $\int_{\theta=0}^{\theta=90} T_{\text{ITO}}(\theta) \sin\theta \, d\theta$ 51%가 . , T_{ITO} () (20)
 . , 82.5% (extraction efficiency) 17% .
 가 가 가 .

(: High-external-quantum-efficiency organic light-emitting device, G. Gu, D.Z.Garbusov, P.E.Burrows, S.Venkatesh, S.R.Forrest, Optics Letters, 22, 396, 1997),
 (laminated lens array) 가
 (: Improvement of output coupling efficiency of organic light-emitting diodes by backside substrate modification, C.F.Madigan, M.H.Lu, J.C.Sturm, Applied Physics Letters, 27, 1650, 2000)
 가 .

(leaky wave)

EL ; EL ; EL ; EL

1/3~2 가 10~200nm

가 1 2,3 가

2 6

2 가 (10) (20), (30), (40), (50)

(20) (10) (凹凸) (photonic crystal) (10) 가 (10)

(10) (20) (20) (20)

3 (10) (square lattice type) 가 (b) (triangular lattice type) 가 (c) (honeycomb lattice type) 가 (d) (random lattice pattern).

(10) (凹凸) 가 10~200nm (35) 1/3~2 (20)

4 (in plane-wave vector) (grating) N $n(k_{in}) < N < n(l)$

TO) a (leaky wave) q (integer) n(ITO) $\cdot \sin = N \cdot k_{in} + q \cdot K$ b (leaky wave) 가

(20) ITO 30 ~ 200nm (leaky wave) 가 (leaky wave) 2 (leaky wave) 가 (leaky wave) 가 (leaky wave) 가

5 (35) 가 2 (3)

5) $\frac{(G)}{3(d)} = \frac{(B)}{2}$. $\sin = \frac{(R)}{2} =$
(leaky wave)

6 (10) 가 (a) (b) 가 가 , 2

(20) , 가 (leaky wave) 가 (10) 가 가

(57)

1.

, 가 / 1/3~2 ;

EL ; EL ; EL ; EL ;

2.

1 , ,

3.

2 , ITO

4.

3 ,

5.

1 , 30 ~ 200nm 가

6.

7.

1 , (凹部) 가 10~200nm

8.

1 ,

9.

1 ,

10.

1 ,

11.

1 ,

12.

1 ,

13.

1 , / 가

14.

1 ,

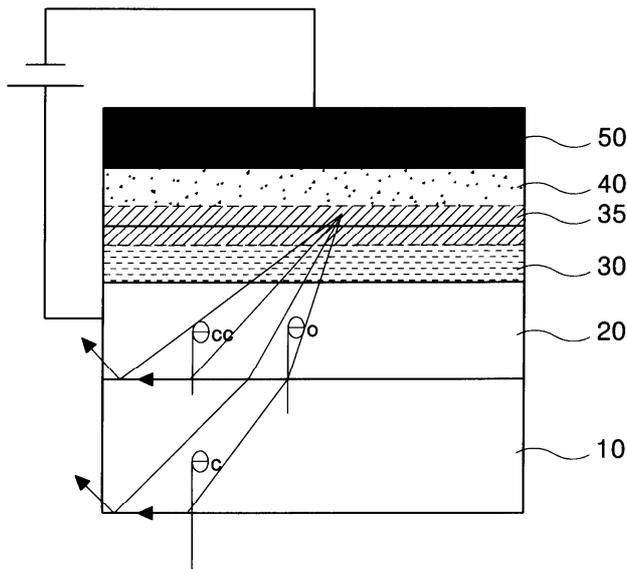
EL

15.

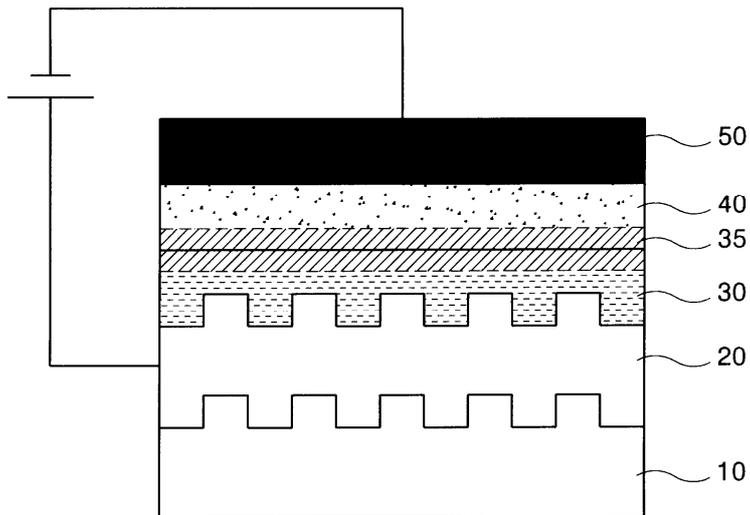
1 ,

가

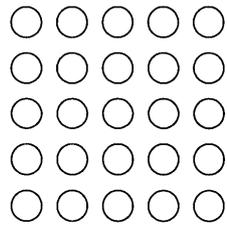
1



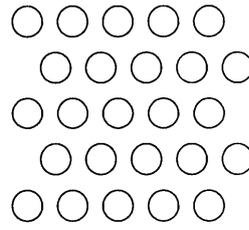
2



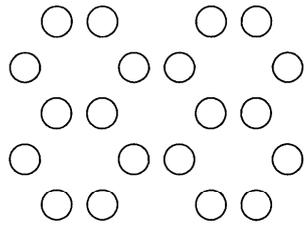
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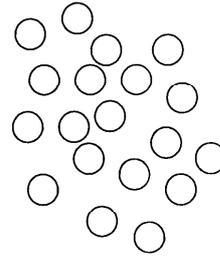
(a)



(b)

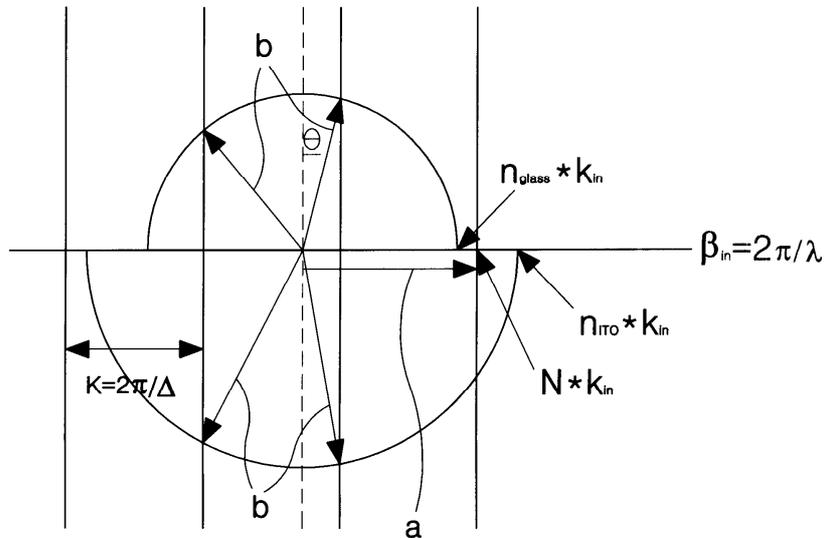


(c)

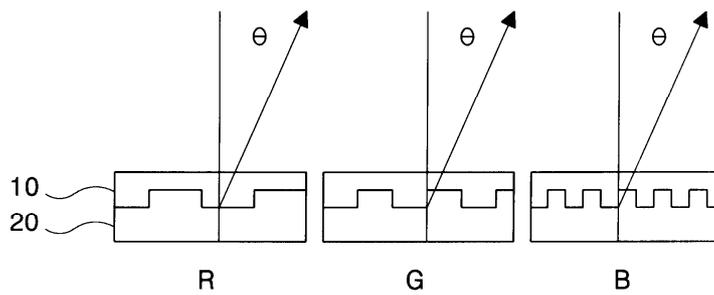


(d)

4



5



6

