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(43)2003 - 0016577  
2003 03 03(21) 10 - 2001 - 0050215  
(22) 2001 08 21

(71) 23 202

(72) 2 750 - 37 9/3

(74) :

(54)

(DLC ) (Cs) 가 , 가  
가 .  
, ,  
(DLC ),  
(DLC ) .  
(Cs) DLC  
가 .

3

(OELD), (DLC), (FPD), (Cs), (Exition)

1

2 1

3

4 3

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&lt; &gt;

101,301 : (Glass Substrate)

102,302 : (Anode)

103,303 : (Emitting Layer;EML)

104,304 : (Cathode)

305 : (Diamond Like Carbon ; DLC)

306 :

Diamond Like Carbon ; 'DLC' ) (Cesium; Cs) 가 (304,  
 가 (electron injection) ,

21 가 , ,  
 Tube) CRT (Cathode Ray  
 FPD(Flat Panel Display) 가 ,  
 가 (FPD) LCD(Liquid Crystal Display) ,  
 CRT 가

, LCD 가 , (contrast),  
 , 가 .  
 , 가  
 (OLED ; Organic Electro Lumine - scence Display)  
 , 2 3 , 가 ,  
 .  
 (Electron) (Hole)  
 (Recombination) (Exitiom)  
 .  
 1 , 2 1 .  
 (Exitiom)  
 , (Exitiom) (electron) (hole) 가  
 1 .  
 1 , (101, Glass Substrate) (102,  
 Anode), (103, Emitting Layer;EML), (104, Cathode)  
 (103, Emitting Layer;EML)  
 (103, EML) (104, Cathode)  
 .  
 (103) (104) 2 , (104)  
 LUMO' ( $E_{FM}$ ) (103) (Lowest Unoccupied Molecular Orbital ;  
 ) (potential barrier)  
 .  
 (103) (Layer)  
 , (104) (103) (band bendin  
 g) (potential barrier) (potential barrier) (electron  
 injection)

(Mg), (Ca) (work function)  
 (104) , (Mg), (Ca) (LUMO)  
 (potential barrier) (devic  
 e) 가 (electron injection) .  
 Mg), (Ca) (reaction) (device)  
 .

(reaction) (glove box)  
 , (glove box) 가 가 .

, (LiF) (104) (Li) (e  
 1electron doner)  
 Electron Injection Layer;EIL), (103) (104) (Electron Transport Layer;ETL)  
 , 가  
 가 가 (electron injection) DLC (Cs)  
 가 (Cs) (layer) , (Cs) , DLC  
 DLC  
 (DLC ), (DLC )  
 (DLC )  
 3 , 4 3  
 3 4 (301, Glass Substrate)  
 (302, Anode), (303, Emitting Layer;EML), (305,  
 Diamond Like Carbon ; DLC) (304, Cathode)  
 (304) (303) 4 (E<sub>V</sub>, E<sub>F</sub>, E<sub>C</sub>) DLC (305)

(303)

(single exciton)

(303)

(Highest Occupied Molecular Orbital; 'HOMO' ) (302, anode)

(LUMO) (304, cathode) 가

(302, anode) ITO(Indium Thin Oxide)

(HOMO) (30

3) (LUMO) (304, cathode)

(303) (304, cathode) DLC (305)

(V - J )

DLC (305) (C<sup>-</sup>) , (C<sup>-</sup>)

DLC (305)

(C<sup>-</sup>) sp<sup>3</sup> 가 DLC (305) sp<sup>3</sup> (orbital) 가

(diamond) sp<sup>3</sup> 가 DLC (305) DLC (305) (e

electron affinity) , (LUMO) (elec

tron energy level) 가

DLC (305) sp<sup>2</sup> 가 (graphite) 가

DLC (305)

DLC (305) sp<sup>3</sup> sp<sup>2</sup>

DLC (305)

DLC (305)

DLC (305) (C<sup>-</sup>)

(304)

DLC (305) (Cs) 1.

9eV 가 (Cs)

(electro - positive) 3.5eV (Li) 가

(Cs) (Cs)

(Fermi level) (303) (304) DLC (305)

(energy barrier) (303) 가 (LUMO)

(electro - positive) (303) (electron injection)

가 ( : ,

: 2001 - 49953 , :2001. 8. 20) (Cs) (deposition) ,  
DLC (305)  
(303) ,

(sputtering) (Cs) (Cs)  
가 가 ,  
(Cs) DLC (305) (Cs)

ion) 가 (Cs) 가 (neutral) (Cs) (Cs+  
(C - ) , DLC (305)  
(Cs) DLC (305)

C (305) (Cs) DLC (305) DL  
DLC (305) (electron affinity) (work function)

5

(303) (306) ,  
5 (301) , 가 가 (302)  
(306) (306) (302) (303)

(304) 가 .  
(306) ,  
(306) DLC ,

(304) (303) DLC (305) DLC  
(306) 가 , (Cs)

가 .

가 DLC

(Cs) DLC  
(electron injection)

(57)

1.

,

;

;

;

(DLC );

(DLC )

,

2.

1 ,

(Cs)

(DLC )

,

3.

1 2 , (DLC )

$sp^3$  (orbital) 가 (diamond)

,

4.

1 2 , (DLC )

$sp^2$  (orbital) 가 (graphite)

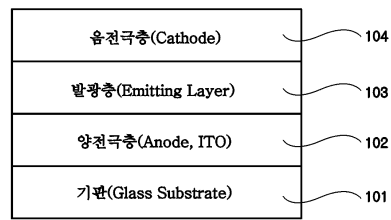
,

5.

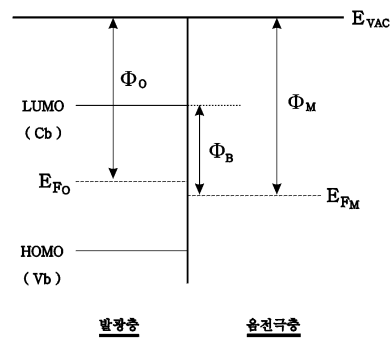
1 ,

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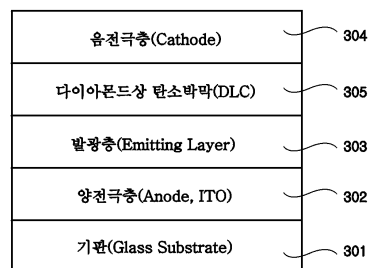
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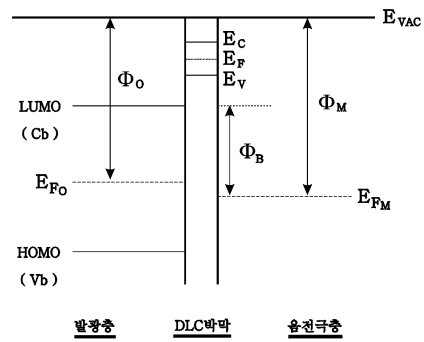


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음전극층(Cathode)	304
다이아몬드상 탄소박막(DLC)	305
발광층(Emitting Layer)	303
양전극층(Anode, ITO)	302
입광흡수층	306
기판(Glass Substrate)	301