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(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
- 5

< >

- 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) , 가

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

, LCD 가 , (contrast),
 , 가

(OLED ; Organic Electro Lumine - scence Display)

, 2 3 , 가 , (Electron) (Hole)
 (Recombination) (Exitiom)

1 , 2 1

1 , (Exitiom) (Exitiom) (electron) (hole) 가
 1

1 , (101, Glass Substrate) (102, Anode), (103, Emitting Layer;EML), (104, Cathode)
 (103, EML) (103, Emitting Layer;EML) (104, Cathode)

LUMO (103) (104) 2 (104)
 (E_{FM}) (103) (Lowest Unoccupied Molecular Orbital ;
) (potential barrier)

g) (103) (104) (103) (Layer)
 injection) (potential barrier) (potential barrier) (band bendin
 (electron

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

(reaction) (glove box) 가 (glove box) 가

, (LiF) (LiF) (104) (Li) (e
 1electron doner) .
 Electron Injection Layer;EIL), (103) (104) (
 (Electron Transport Layer;ETL)
 , 가 ,
 가 가 가 , DLC (Cs)
 가 (electron injection) ,
 , DLC
 (Cs) (layer) , (Cs)
 (Cs)
 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 DLC (305)
 (E_V, E_F, E_C)

(single exciton) (303)

(Highest Occupied Molecular Orbitals; HOMO) (303)
 (LUMO) (304, cathode) 가 (302, anode)
 (HOMO) (302, anode) ITO(Indium Thin Oxide) (30)
 3) (LUMO) (304, cathode)

(303) (304, cathode) DLC (305)
 (V - J)

DLC (305) (C⁻) (C⁻)
 DLC (305)

(diamond) (C⁻) DLC (305) sp³ (orbital) 가 (e
 electron affinity) sp³ 가 DLC (305) (LUMO) (elec
 tron energy level) 가

DLC (305) DLC (305) sp² 가 (graphite) 가

DLC (305) sp³ sp²

DLC (305) DLC (305) DLC (305) (C⁻)
 (304)

9eV DLC (305) (Cs) (Cs) 1.
 가 (electro - positive) 3.5eV (Li) 가

(Cs) (Cs) (303) (304) DLC (305)
 (Fermi level) (303) (LUMO)
 (energy barrier) 가
 (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) DLC (305)
(Cs) DLC (305)

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

5

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

(304) 가
(306)

(306) DLC ,

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

가 .

DLC

가

(Cs) DLC
(electron injection)

(57)

1.

,
;
;
;
(DLC);
(DLC)

2.

1 ,
(Cs) (DLC)

3.

1 2 , (DLC)
 sp^3 (orbital) 가 (diamond)

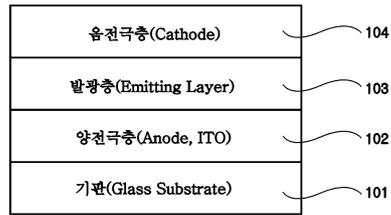
4.

1 2 , (DLC)
 sp^2 (orbital) 가 (graphite)

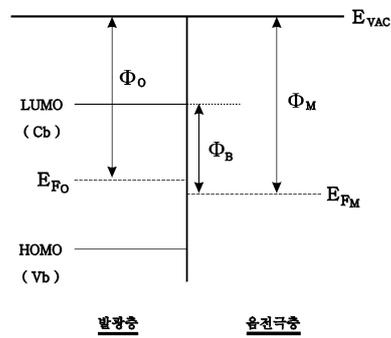
5.

1 ,
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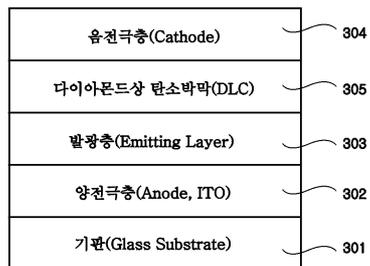
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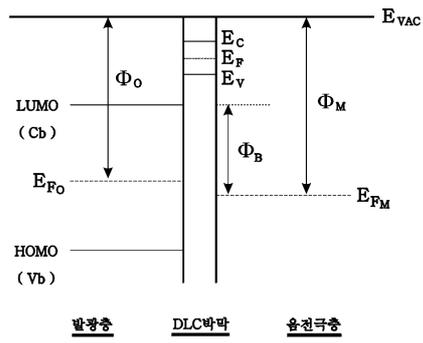
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