

(19)  
(12)

(KR)  
(A)

(51) 。 Int. Cl. <sup>7</sup>  
H01L 21/205

(11)  
(43)

2002 - 0076184  
2002 10 09

(21) 10 - 2002 - 0016620  
(22) 2002 03 27

(30) 09/820,227 2001 03 27 (US)

(71) 가 가 가 22 22

(72) 98683 18 가 18806  
98682 227 가 8115  
97007 179 가 7574  
98607 2216

(74) :

(54)

가 ; ( - )Cu(I)(hfac) [ hfac ] (hfac)Cu(I)L [ L ; 가 ]  
L ;  
hfac . ] (hfac)Cu(I)L [ L 1- , 1- )Cu(I)(hfac) [ ]

CVD  
 ~ 1.7 μ - cm  
 IC CVD

CVD  
 < 1.8 μ - cm,  
 CVD 가 가  
 CVD

[Beach, Chem. Mater., Vol. 2, pp. 216 - 219 (1990)]  
 Cu(C<sub>5</sub>H<sub>5</sub>)(PR<sub>3</sub>) [ R = , ] CVD Hampden  
 - Smith (tert - BuO)Cu(PMe<sub>3</sub>) [Chem. Mater., Vol. 2, p636 (1990)]  
 ].

1990 (I) 가  
 CVD 가 (I)  
 Doyle 4,385,005 (Process for separating unsaturated hydrocarbons using copper or silver complexes with fluorinated diketonates, 1983 5 24 ) 4,425,281 (Copper or silver complexes with fluorinated diketones and unsaturated ligands, 1984 1 10 )  
 [Doyle, Org anometallics, Vol. 4, p. 830 (1985)].

5,096,737 (Baum, Ligand stabilized +1 metal - diketonate coordination complexes and their use in chemical vapor deposition of metal thin films, 1992 3 17 ) CVD  
 (I) 가 [Baum, Chem. Mater., Vol. 4, p365 (1992)] [Baum, J. Electrochem. Soc., 1993, Vol. 140, No. 1., 154 - 158 (1993)]  
 Cu(hfac)(CH<sub>3</sub>C≡CCH<sub>3</sub>) 가 CV  
 D

1,6 - 1,5 - (I) 1,5 - 1,5 -  
 ((HYN)Cu(hfac)) ((DMCOD)Cu(hfac)), (I)  
 가 가 . (DMCOD)Cu(hfac)  
 , 2.5 μ - cm

, (HYN)Cu(hfac) TiN 가 ,  
2.1 μ - cm

(I)(hfac) ((BUY)Cu(hfac)) 1.93 μ - cm  
가 가

[Norman , Journal de Physique IV, Vol. 1., C2 - 271 - 278, 1991 9 ] 5,085,731 (Vol  
atile liquid precursors for the chemical vapor deposition of copper, 1992 2 4 )

Cu(hfac)(TMVS) [ TMVS = ] ,  
Cu(hfac)(TMVS)  
CVD  
TMVS 가 가 가

가 ; ( - )Cu(I)(hfac) [ hfac ] (hfac)Cu(I)L [  
L ] ; 가

( - )Cu(I)(hfac) [ hfac  
] (hfac)Cu(I)L [ L 1 - , 1 -  
]

, 가 CVD

CVD

가

CVD

( - )Cu(I)(hfac) [ hfac  
] (hfac)Cu(I)L [ L , 1 - , 1 - ]  
( - )Cu(I)(hfac) (hfac)Cu(I)L 가 ,  
. 2 3 , CVD

c)Cu(I)1 - 10 % (w/w) ( - )Cu(I)(hfac) 90 % (w/w) (hfac)Cu(I)TMVS  
 10 % (w/w) ( - )Cu(I)(hfac) 90 % (w/w) (hfa  
 CVD 65 , 65 , 190 , 0.5 ,  
 100 sccm , 2.5 sccm , 20 mm

IC , 1.9 μ - cm , 가  
 (seed layer) , CVD  
 가

(57)  
 1.

가 ; ( - )Cu(I)(hfac) [ hfac , 가 ] (hfac)Cu(I)  
 L [ L ] ;

2.  
 1 , 가 1 - , 1 -

3.  
 1 , 가 10 % ( - )Cu(I)(hfac) 90 %  
 (hfac)Cu(I)L

4.  
 1 , 가 65 , 65 ,  
 190 , 0.5 , 100 sccm ,  
 2.5 sccm , 20 mm

5.

가 ; ( - )Cu(I)(hfac) [ hfac ] (hfac)Cu(I)  
 L [ L 1- , 1- ,  
 , 10 % ( - )Cu(I)(hfac) 90  
 % (hfac)Cu(I)L ; 가  
 ;

6.

5 , 가 65 , 65 ,  
 190 , 0.5 , 100 sccm ,  
 2.5 sccm , 20 mm .

7.

, ( - )Cu(I)(hfac) [ hfac  
 ] (hfac)Cu(I)L [ L 1- , 1-  
 ] .

8.

7 , 10 % ( - )Cu(I)(hfac) 90 % (hfac)Cu(I)L  
 .

9.

7 , 가 65 , 65 , 190  
 , 0.5 , 100 sccm ,  
 2.5 sccm , 20 mm .