

(19)
(12)

(KR)
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H01L 21/205

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(11)
(24)

2004 06 05
10-0434489
2004 05 25

(21) 10-2001-0015001
(22) 2001 03 22

(65)
(43)

10-2002-0074922
2002 10 04

(73) 416

(72) 7 1603-25

530 203 1302

1436-1 20 805

301 703

1081-34

539-11

(74)
:

(54)

가 가 가 가
, , , ,
/ , . , ,

6a

1
 2 가
 3a 3b, 4a 4b 5a 5b
 6a 6b
 7 / 가
 8a 8d 7 A D
 9 7 A D / 가
 10 / 가
 11a 11b

3
 (Ru), (Pt), (Ir), (Os) 가
 가 Ta₂O₅, BST((Ba,Sr)TiO₃), PZT((Pb,Zr)TiO₃) 가
 가
 가
 가
 가 ()
 가

가 , 가 ,

$C_{11}H_{10}O_2$, $Ru(C_5H_5)_2$, $Ru(CH_3CH_2CH_2CH_2CH_3C_5H_3)_3$, $Ru(C_2H_5C_2H_4)_2$, $Ru(C_2H_5C_2H_4)_2$, $Ru(EtCp)_2$
 7, 10, 20Torr, 1250sccm, 0.09ccm(E), 0.05ccm(C), 0.06ccm(D), 0.05ccm(C), 8d, 8b, 8a, 8c, A, B, C, D, G, H, I, F, 30Torr, 500sccm(I), 1000sccm(H), 1500sccm(F), 2000sccm(F), 7, 8a, 10, 50Torr, 500, 2000sccm, 0.1, 10Torr, 50Torr, 10, 200, 400, 3, 0.05/1250(4×10^{-5}), 50Torr, 200, 400, 3, 0.1 ~ 10Torr, 100, 270~350, $Ru(EtCp)_2$, 20~30Torr, (Show, 11a, 11b, 가 1000nm, 110nm, 0.5~5Torr, (CD:critical dimension) 가

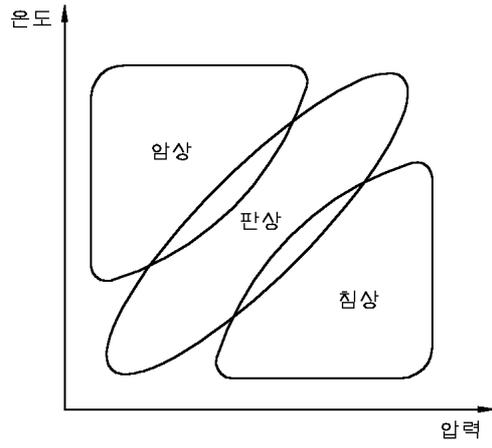
. RuO₂ 가 320 , 20 Torr, Ru(EtCp)₂ 0.03sccm, 가 1250sccm
 20 , 320 , 0.5 Torr, Ru(EtCp)₂ 0.045ccm, 가
 45sccm 4 , , ,

가 , ()
 가 ,
 / , 가

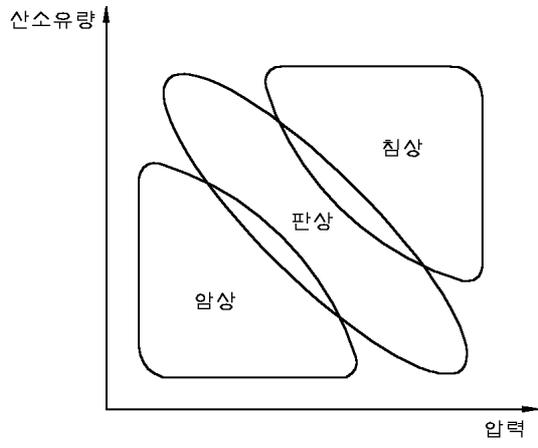
(57)

1. 가 , 가 ,
2. 가 , 가 ,
3. 가 , 가 ,
4. 가 , 가 ,
5. 가 , 가 , 1 1
6. 5 , 1 5 50Torr ,
7. 5 , 2 0.1 10Torr ,
8. 5 , 1 500 2000sccm ,
9. 5 , 2 10 300sccm ,
10. 1 6 , , 200 400 ,
11. 10 , ,
12. 1 , Ru(C₂H₅C₂H₄)₂, Ru(C₁₁H₁₀O₂)₃, Ru(C₅H₅)₂
 Ru(CH₃CH₂CH₂CH₂CH₃C₅H₃)₃ ,
13. 1 , Ru(C₂H₅C₂H₄)₂ 가
 가 6 x 10⁻⁵ ,

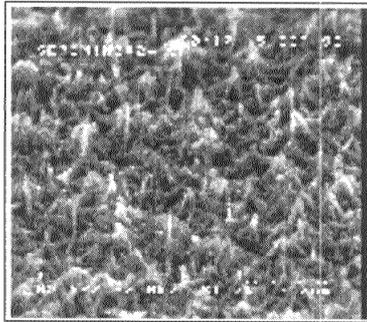
1



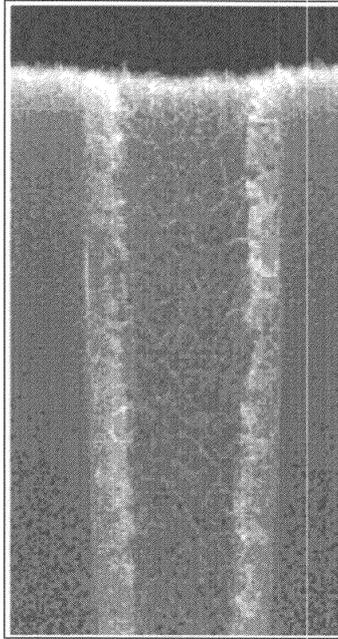
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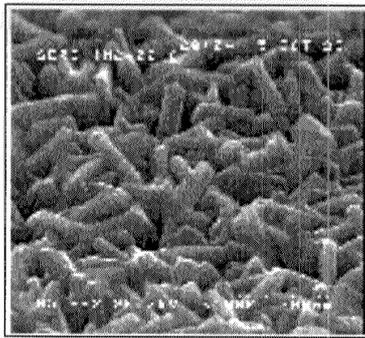
3a



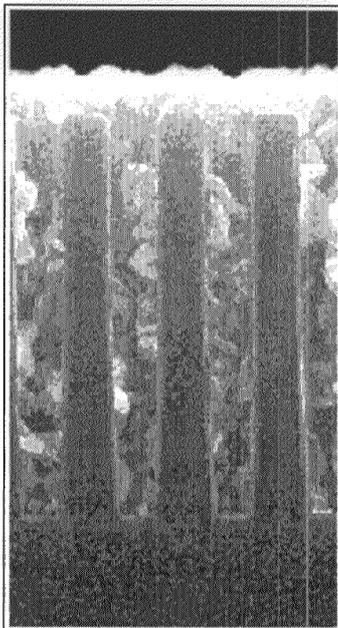
3b

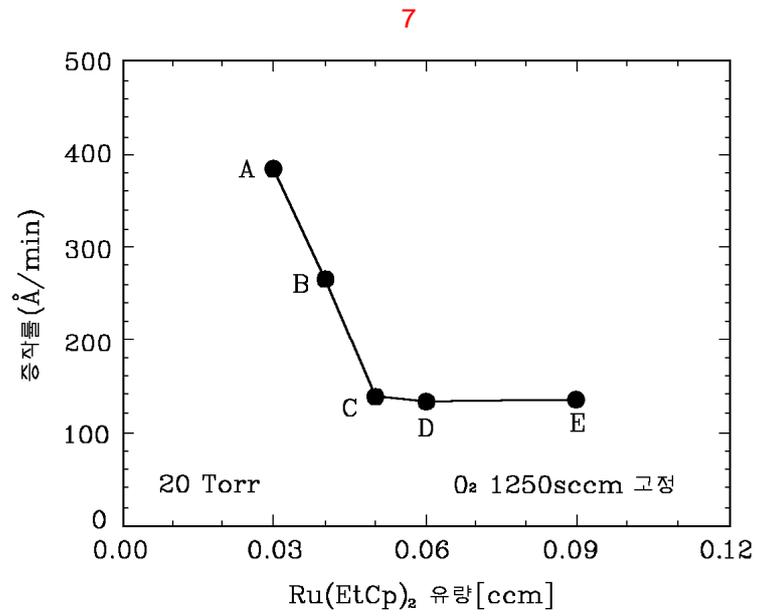


4a

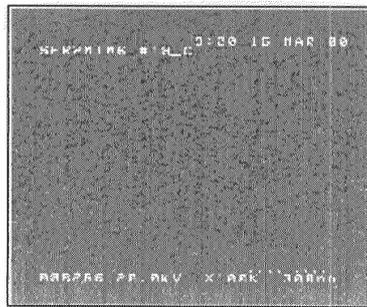


4b

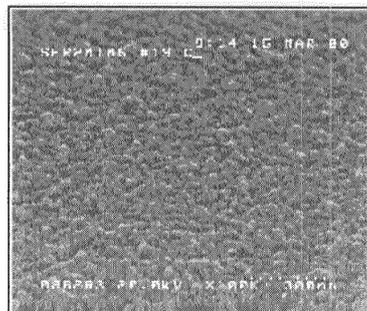




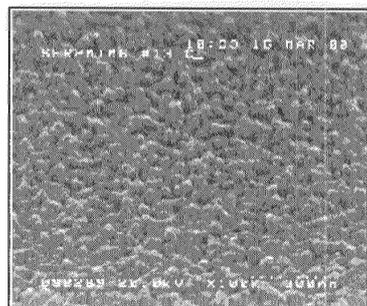
8a



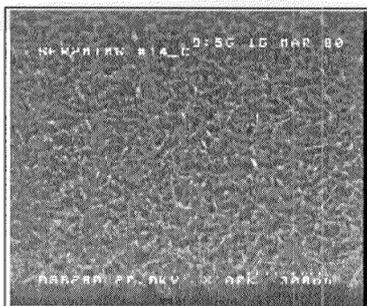
8b



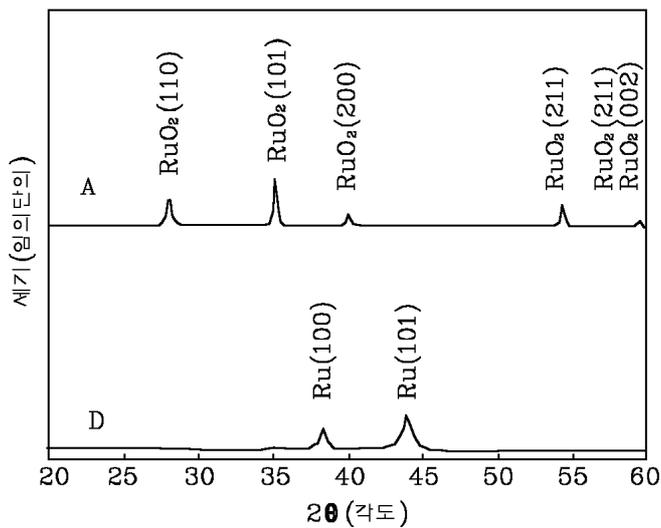
8c



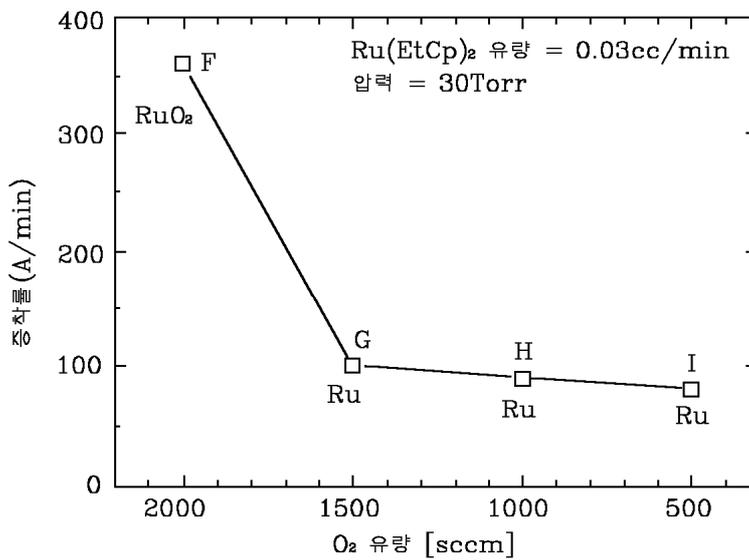
8d



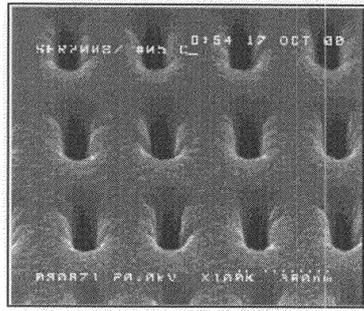
9



10



11a



11b

