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(73) 416

(72) 7 1603-25

530 203 1302

1436-1 20 805

301 703

1081-34

539-11

(74)
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(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, 20Torr 가 1250sccm 가
 0.09ccm(E) 0.06ccm(D) 가
 0.05ccm(C) 가 8d 가 0.05ccm(C) 가 8c

가 B A 가 8b 8a 가 가 가

가 가 가 가 가 가

9, A 7 A D 가 가 D

30Torr $Ru(EtCp)_2$ 0.03ccm 가 가 가 500sccm(I) 1000sccm(H) 1500
 sccm(G) 가 가 가 가 2000sccm(F) 가 가

(F) 8d 9 (G, H I) 가 7, 8a

7 10 가 가 가 가 가

가 가 가 가 가 가

0.1 5 50Torr 가 가 500 2000sccm
 10Torr 가 10 300sccm

가 RuO_2 가 가

가 0.05/1250(4×10^{-5}) 가 RuO_2 가 가

00 (5 50Torr 200 400 3
 er head type) 0.1 ~10Torr 가
 270~350 $Ru(EtCp)_2$ 20~30Torr (Show

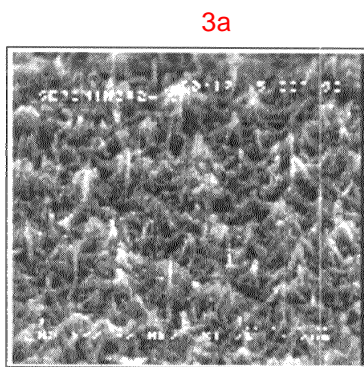
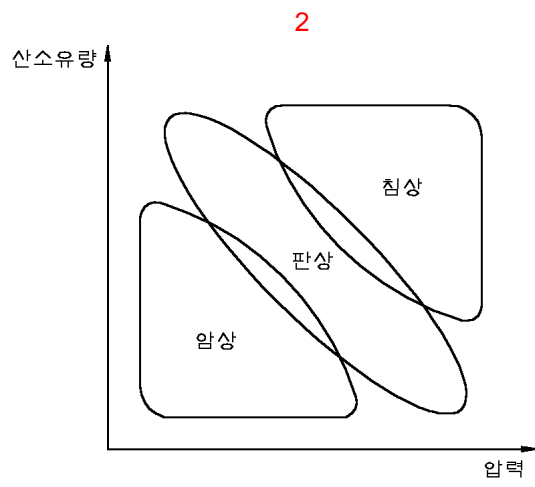
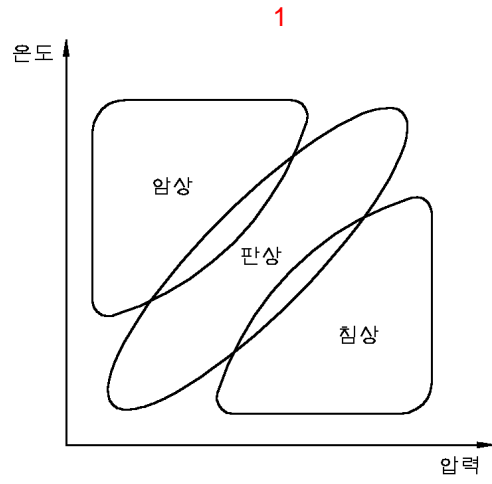
11a 11b 가 1000nm 110nm (CD:critical dimension) 가

. 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 , , ,

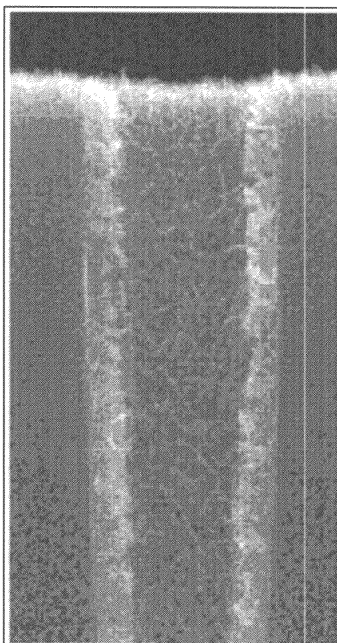
가 , ()
 가 ,
 / , 가

(57)

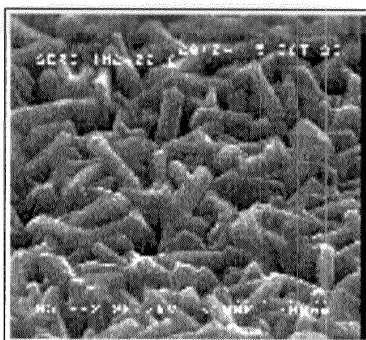
1. 가 , 가 ,
- 가 , 가 ,
2. 가 , 가 ,
- 1 , 가 , 가 ,
3. 가 , 가 ,
- 1 , 가 ,
- 가 4. , 가 ,
- 1 , , ,
5. , 1 , 1 , 1
- 가 2 , 가 1 2 1
6. , 1 5 50Torr ,
- 5 7. , 2 0.1 10Torr ,
- 5 8. , 1 500 2000sccm ,
- 5 9. , 2 10 300sccm ,
10. 6 , ,
- 200 400
11. 10 ,
12. , Ru(C₂H₅C₂H₄)₂, Ru(C₁₁H₁₀O₂)₃, Ru(C₅H₅)₂
 Ru(CH₃CH₂CH₂CH₂CH₃C₅H₃)₃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



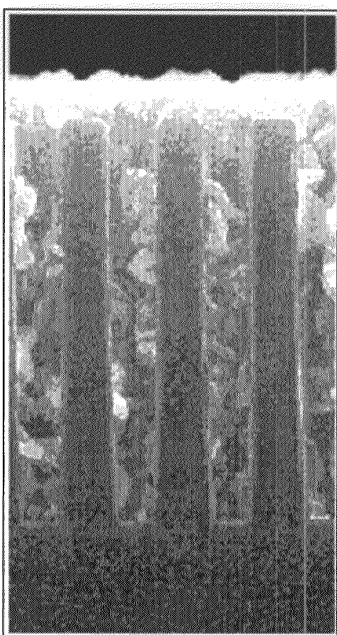
3b



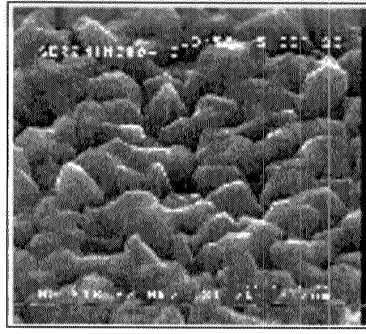
4a



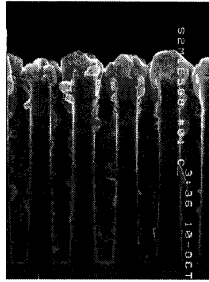
4b



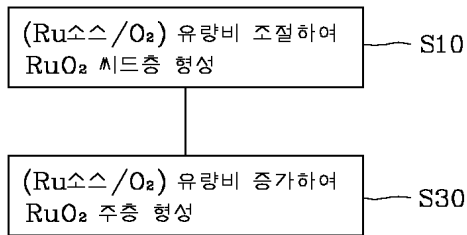
5a



5b

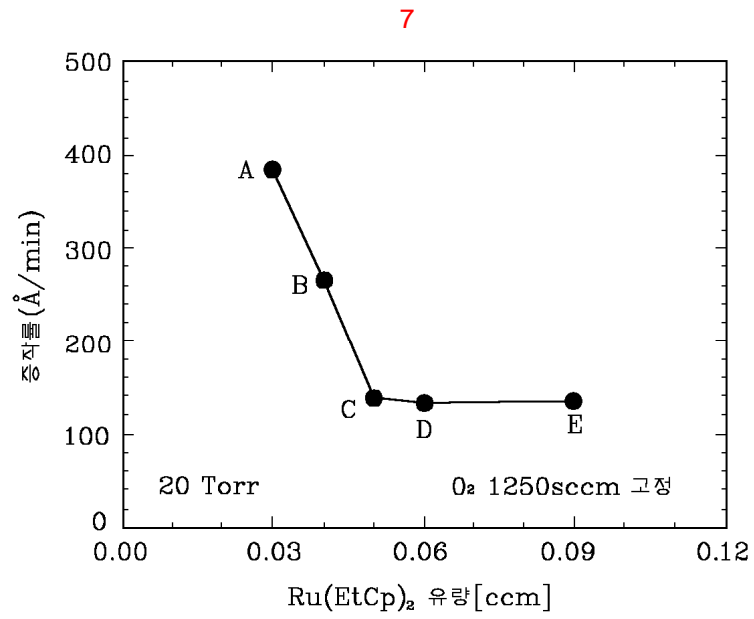


6a

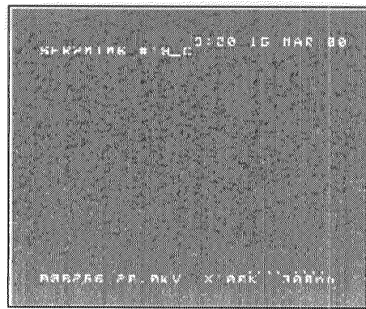


6b

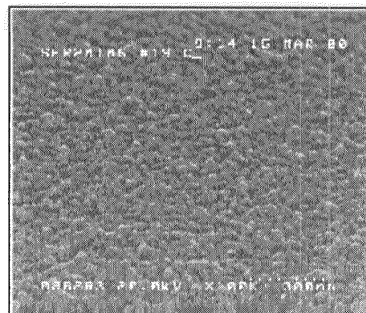




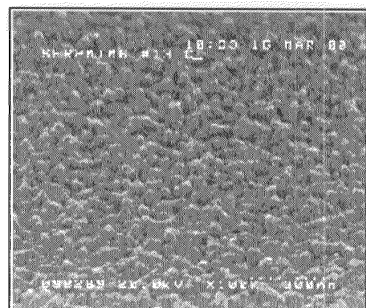
8a



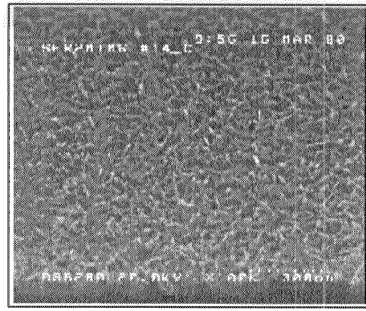
8b



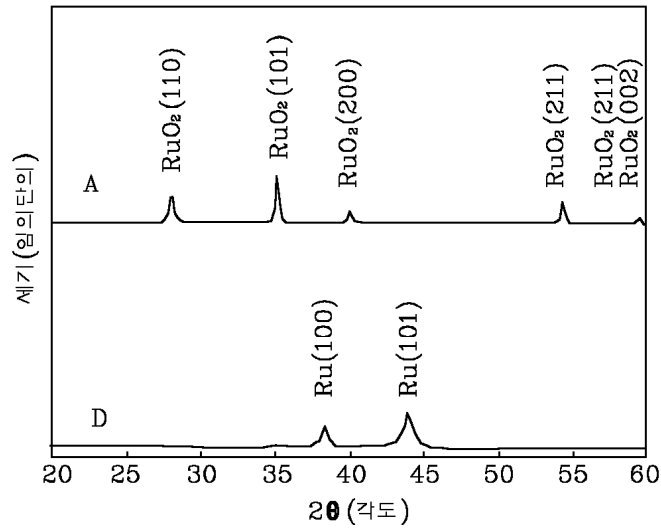
8c



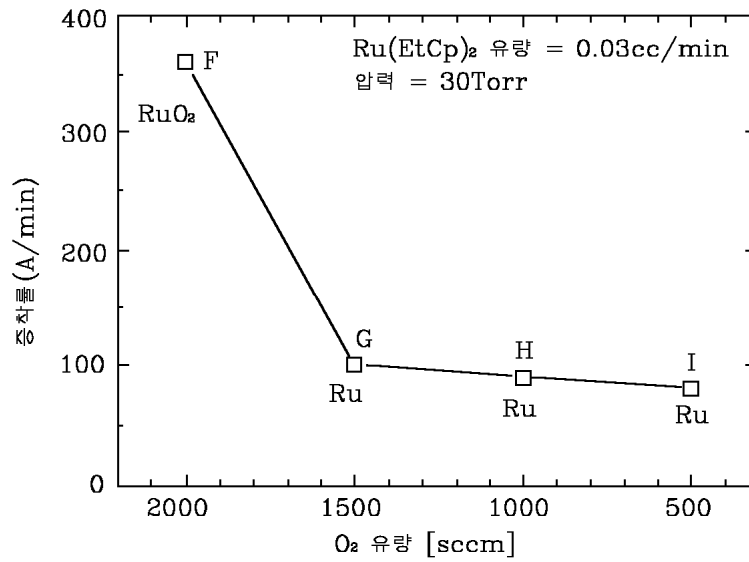
8d



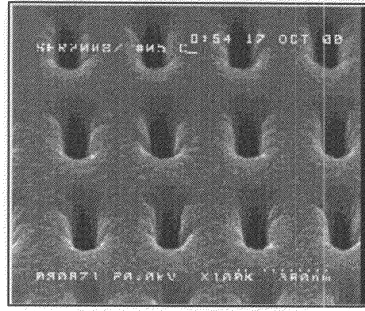
9



10



11a



11b

