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(43)

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2002 07 25

(73) 3 416

(72) 1 120-139

3 1509-1 102 501

1 108 803

(74)

:

(54)

가 Ta Zr

4a

1 Ru
2
3

Ru

4a 4b

가 , Ta₂O₅, TiO₂, Al₂O₃, Y₂O₃, ZrO₂, HfO₂, Ba
 TiO₃, SrTiO₃ 가 , 가

TiN , Pt, Ru, Ir
 1 (100) Ru (110) 250 ,
 RuO₂, O₃ Ru (110) Ru (110) (柱狀) (120)
 , Ru(110) , RuO₂ (120)
 가 (,)

Ta Zr 가

Ta(OC₂H₅)₅ Ta(OCH₃)₅

Ta Zr

2 Pt Ir , TiN (a). Ru,
 , (Ti,Ta)N

가 (b). 가 Ta(OCH₂H₅)
 Ta(OCH₃)₅ 가

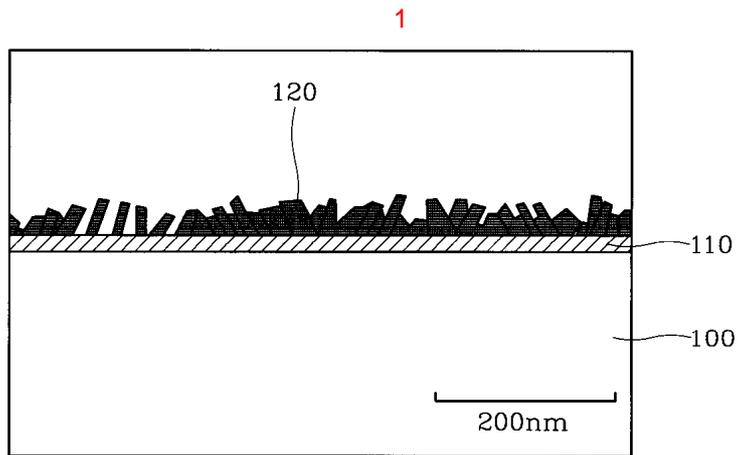
가

, Ru
 TEOS Ru Ta(OC₂H₅)₅ 가
 H₅)₅ 가 , O₃ 100 250 Ta(OC₂H₅)₅
 TEOS , Ru
 4a 4b
 4a , Ru (310) 4a 4b (330) (340) (350)
 00 TEOS RuO₂ (320) 4b (340) (350) 3
 3 가 가

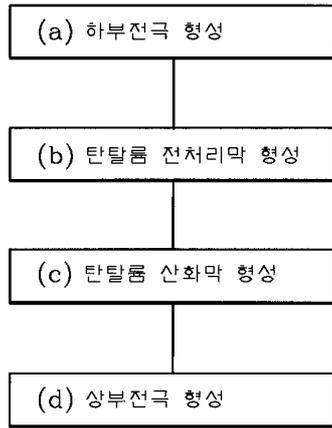
(57)

1.
 - a) Ta Zr ; 가
 - b) ;
 - c) ;
 - d) ;
- 2.
3. Ru, Pt, Ir
- 4.
5. Ta(OC₂H₅)₅ Ta(OCH₃)₅
6. Ti, Ta W
7.
 - a) ; Ta Zr
 - b) ;
- 8.
- 9.

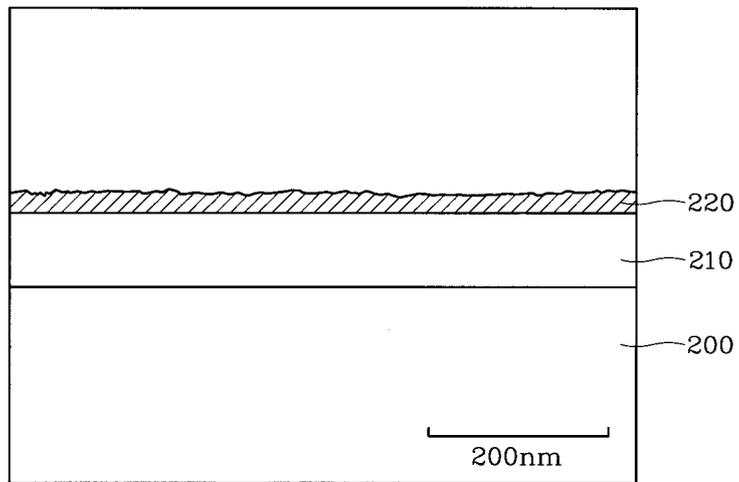
- 7 , Ta(OC₂H₅)₅ Ta(OCH₃)₅
10. f) g)
- 5 11. f) h) 100 ~ 600
- 5 12. h) 가 가
- 1 13. c) ; ;
가 ;
가 ;
가 가 ;
14. 가 가
- 13 15. 가 Ta(OC₂H₅)₅ Ta(OCH₃)₅ TaCl₅
- 14 16. 가 H₂O, H₂O₂, O₂, N₂O, O₃
- 13



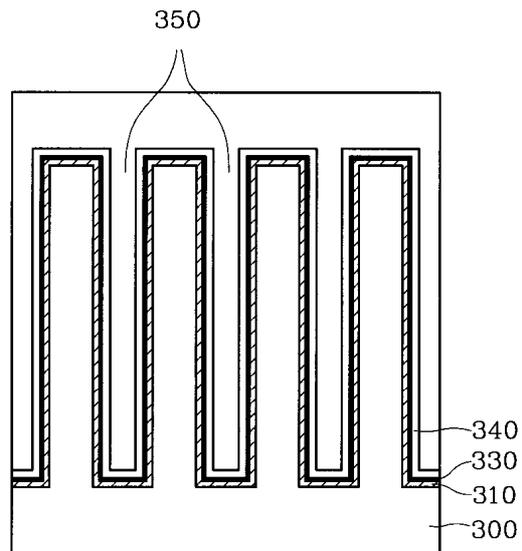
2



3



4a



4b

