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(11) 2003-0043641
(43) 2003 06 02

(21) 10-2002-0068671
(22) 2002 11 07

(30) 60/331,920 2001 11 20 (US)

(71) 19106-2399 , , , 100

(72) , 19002, , , 1676

가 , 19380, , , 805

, 19002, , , 701

(74)

:(
(ready change-over) , , ,

2

3 300

4A, 4B, 4C 4C

101 102

201 202

(ready change-over)

,
6,214,195 B1.

가

1

A_aM_mN_nX_xO_o

(A Mo W ,

A Mo W ,

M V Ce ,

N Te, Se Sb ,

X Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, As, Ge, Sn, Li, Na, K, Cs, Fr, Be, Mg, Ca, Sr, Ba, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Th, Yb, Lu, Au, Ag, Pd, Ga, Pr, Re, Ir, Nd, Y, Sm Tb ,

a=1 , m=0.01-1.0, n=0.01-1.0, x=0.01-1.0 o .)

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1 1

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2 2

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4 ,

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가

250nm

100nm

가

20%
1 cm²/g

가

(confinement size)'

2

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, $1 \text{ cm}^2/\text{g}$

100cm²/g

1 m²/g

가 가

		Ag/
		Cu ₂ O, Bi
o-,		V ₂ O ₅ , V ₂ O ₅ /TiO ₂ , V ₂ O ₅ -K ₂ S ₂ O ₇ /SiO ₂
		V ₂ O ₅ -P ₂ O ₅ /
		V ₂ O ₅ , V ₂ O ₅ -MoO ₃ , P ₂ O ₅ /
+ NH ₃		Bi, U-Sb
+ NH ₃		
+ NH ₃		V ₂ O ₅ -MoO ₃ /Al ₂ O ₃
m- + NH ₃		V ₂ O ₅ -MoO ₃ /Al ₂ O ₃
o- + NH ₃		V ₂ O ₅ -Sb ₂ O ₅
3- 4- + NH ₃ 3- 4-		V ₂ O ₅ -MoO ₃ /Al ₂ O ₃
+ NH ₃ HCN		Pt-Rh
+ HCl		CuCl ₂ /Al ₂ O ₃
+ NH ₃		
+ NH ₃		

A_a M_m N_n X_x O_o

(A Mo W

A Mo W

M V Ce

N Te, Se Sb

X Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, As, Ge, Sn, Li, Na, K, Cs, Fr, Be, Mg, Ca, Sr, Ba, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Th, Yb, Lu, Au, Ag, Pd, Ga, Pr, Re, Ir, Nd, Y, Sm Tb

a=1 , m=0.01 - 1.0, n=0.01 - 1.0, x=0.01 - 1.0 o .)

, a=1 , m=0.1-0.5, n=0.05-0.5 x=0.01-0.5 . , a=1 , m=0
 .15-0.45, n=0.05-0.45, x=0.01-0.1 o ,
 . . 0 3-4.7 .

Mo_aV_mTe_nNb_xO_o W_aV_mTe_nNb_xO_o 가
a, m, n, x, o .

1 , , , , , A, M, N, X , O .

Mo_aV_mTe_nNb_xO_o(_{1-x}), A/Mo, M/V, N/Te X

가

() ,

75-150, 40-90, -40mmHg 10-350mmHg, 25-90, 25-90, 40-60, 10-760mmHg, 125-200, 10 가

4a, 4b, 4c 4d

가 가

가

가

가

가, 가,):(: 가): (H₂O)
1):(1-5.0):(0-10):(5-40)가 가
(1):(0.1-10):(0-20):(0.2:70),
(

가

가

가

C₃₋₈

%,

3-90 %

0.5 %,

1.0-95

가

가,

가

가,

가

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가 /

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가

가

가

가
가

가

가

25

0.2-18

, 가

가

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(57)

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A_aM_mN_nX_xO_o

(A Mo W

A Mo W

M V Ce

N Te, Se Sb

X Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Th, Yb, Lu, Au, Ag, Pd, Ga, Pr, Re, Ir, Nd, Y, Sm Tb

a=1 , m=0.01-1.0, n=0.01-1.0, x=0.01-1.0 o .)

2.

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A_aM_mN_nX_xO_o

(A Mo W

A Mo W

M V Ce

N Te, Se Sb

X Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, As, Ge, Sn, Li, Na, K, Cs, Fr, Be, Mg, Ca, Sr, Ba, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Th, Yb, Lu, Au, Ag, Pd, Ga, Pr, Re, Ir, Nd, Y, Sm Tb

a=1 , m=0.01 - 1.0, n=0.01 - 1.0, x=0.01 - 1.0 o .)

3.

2 , A Mo ; M V ; N Sb ; X Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, N
i, Pt, Bi, B, In, Ge, Sn, Li, Be, Hf, Pb, Pm, Eu, Gd, Dy, Ho, Er, Th, Yb, Lu, Au, Ag, Pd, Ga, Pr, Re, Ir, Nd, Y, S
m Tb

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A_aM_mN_nX_xO_o

(A Mo W

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A Mo W

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M V Ce

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N Te, Se Sb

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X Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Th, Yb, Lu, Au, Ag, Pd, Ga, Pr, Re, Ir, Nd, Y, Sm Tb

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a=1

, m=0.01 - 1.0, n=0.01 - 1.0, x=0.01 - 1.0

o .)

18.

17

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A_aM_mN_nX_xO_o

(A Mo W

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A Mo W

,

M V Ce

,

N Te, Se Sb

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X Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, As, Ge, Sn, Li, Na, K, Cs, Fr, Be, Mg, Ca, Sr, Ba, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Th, Yb, Lu, Au, Ag, Pd, Ga, Pr, Re, Ir, Nd, Y, Sm Tb

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a=1

, m=0.01 - 1.0, n=0.01 - 1.0, x=0.01 - 1.0

o .)

19.

18 , A Mo ; M V ; N Sb ; X Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ge, Sn, Li, Be, Hf, Pb, Pm, Eu, Gd, Dy, Ho, Er, Th, Yb, Lu, Au, Ag, Pd, Ga, Pr, Re, Ir, Nd, Y, Sm Tb

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A_aM_mN_nX_xO_o

(A Mo W ,

A Mo W ,

M V Ce ,

N Te, Se Sb ,

X Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Th, Yb, Lu, Au, Ag, Pd, Ga, Pr, Re, Ir, Nd, Y, Sm Tb ,

a=1 , m=0.01 - 1.0, n=0.01 - 1.0, x=0.01 - 1.0 o .)

28.

27 ,

A a M m N n X x O o

(A Mo W ,

A Mo W ,

M V Ce ,

N Te, Se Sb ,

X Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, As, Ge, Sn, Li, Na, K, Cs, Fr, Be, Mg, Ca, Sr, Ba, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Th, Yb, Lu, Au, Ag, Pd, Ga, Pr, Re, Ir, Nd, Y, Sm Tb ,

a=1 , m=0.01 - 1.0, n=0.01 - 1.0, x=0.01 - 1.0 o .)

29.

28 , A Mo ; M V ; N Sb ; X Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ge, Sn, Li, Be, Hf, Pb, Pm, Eu, Gd, Dy, Ho, Er, Th, Yb, Lu, Au, Ag, Pd, Ga, Pr, Re, Ir, Nd, Y, Sm Tb ,

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44.

43

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A_aM_mN_nX_xO_o

(A Mo W

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A Mo W

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M V Ce

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N Te, Se Sb ,

X Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Th, Yb, Lu, Au, Ag, Pd, Ga, Pr, Re, Ir, Nd, Y, Sm Tb ,

a=1 , m=0.01 - 1.0, n=0.01 - 1.0, x=0.01 - 1.0 o .)

45.

44 ,

A_a M_m N_n X_x O_o

(A Mo W ,

A Mo W ,

M V Ce ,

N Te, Se Sb ,

X Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, As, Ge, Sn, Li, Na, K, Cs, Fr, Be, Mg, Ca, Sr, Ba, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Th, Yb, Lu, Au, Ag, Pd, Ga, Pr, Re, Ir, Nd, Y, Sm Tb ,

a=1 , m=0.01 - 1.0, n=0.01 - 1.0, x=0.01 - 1.0 o .)

46.

43 ,

47.

43 ,

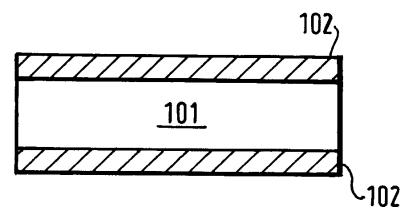
48.

43 ,

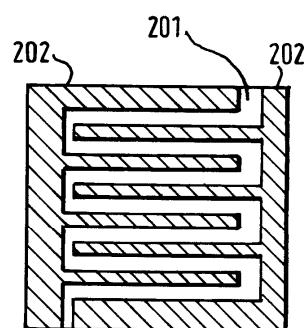
49.

43 ,

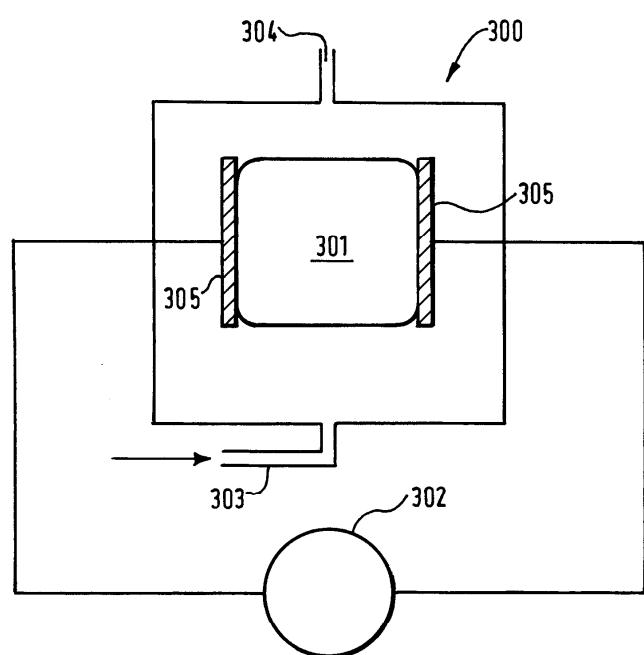
1



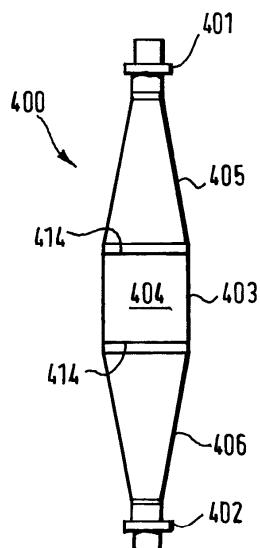
2



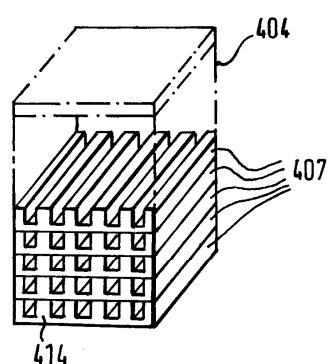
3



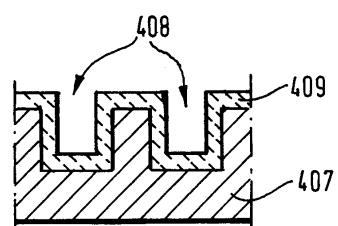
4a



4b



4c



4d

