

(19)  
(12)

(KR)  
(A)

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(11)  
(43)

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(71) 가 가

4 - 1 - 1

(72) 가 86 - 4  
3 - 29 - 1 - 315  
가 186 - 15

(74)

:

(54)

B C

B C

,

1

1

Mo<sub>a</sub> V<sub>b</sub> W<sub>c</sub> Cu<sub>d</sub> A<sub>e</sub> B<sub>f</sub> C<sub>g</sub> D<sub>h</sub> E<sub>i</sub> O<sub>x</sub>

[ , Mo ; V ; W ; Cu ; A ,  
 1 ; B 1 ; C , ,  
 ; D , , , , 1  
 ; E IA IIIb , , , , 1  
 ; O ; a, b, c, d, e, f, g, h, i x Mo, V, W, Cu, A, B, C, D, E O  
 $a = 12, 2 \leq b \leq 15, 0 \leq c \leq 10, 0 < d \leq 6, 0 \leq e \leq 6, 0 < f \leq 10, 0 < g \leq 10, 0 \leq h$   
 $\leq 5, 0 \leq i \leq 5$  , x ]

가  
 12129/69 , 가 ; 113  
 71/74 , , 가 ; 25914/75  
 , , 가 ; 85091/77  
 , 가  
 가  
 117419/74 , , 가

가,

B C

B C

1

:

[ 1 ]



[ , ]

B C

1

B C

:

[ 1 ]



[ , Mo ; V ; W ; Cu ; A ,  
 1 ; B 1 ; C , ,  
 ; E IA IIIb , , , 1  
 ; O ; a, b, c, d, e, f, g, h, i x Mo, V, W, Cu, A, B, C, D, E O  
 f ≦ 10 ( a = 12, 2 ≦ b ≦ 15, 0 ≦ c ≦ 10, 0 < d ≦ 6 ( 0.05 ≦ d ≦ 6 ), 0 ≦ e ≦ 6, 0 <  
 , x 0.01 ≦ f ≦ 10 ), 0 < g ≦ 10 ( 0.01 ≦ g ≦ 10 ), 0 ≦ h ≦ 5, 0 ≦ i ≦ 5 ]

1

117,419/74

A ;

D ; , , , , 가 E

C ; ,

) B C

( , B/C - , B C )

B

가

B C

B/C

- 1/1,

( , B

0.8/1 1/1 . ,

B C

B/C

Mo, V, W, Cu, A, D E ;

B/C - , B C ( )  
 (CaSiO<sub>3</sub>), (BaTiO<sub>3</sub>), (2BaOAl<sub>2</sub>O<sub>3</sub> · 5H<sub>2</sub>O), (SrTiO<sub>3</sub>), (CaTiO<sub>3</sub>), (Mg<sub>2</sub>Si<sub>3</sub>O<sub>8</sub> · 5H<sub>2</sub>O), (CaZrO<sub>3</sub>)  
 B - C - :  
 500 - 2000 ; B - C -  
 500 - 2000 ;

B/C - , 200μm , 100μm , 가 50μm

B C 가 1 , B/C - B C 1 E  
 B/C - E

, B/C - B C

1 - 15mm, 3 - 10mm , ,

가 가 , ( , )가 가 ,

( ) , ( ) +  
 1 )] × 100 ) 10 - 70 % , 15 - 50 %

가

가

20 - 80 % , 1 - 15 % , 0.5 - 25 % , 1 - 30 %  
 0 , 300 - 5,000 h<sup>-1</sup> (STP) 0.1 - 1 MPa 200 40

가

[ ]

$$(\%) = \frac{(\text{ " } )}{(\text{ " } )} \times 100$$

$$(\%) = \frac{(\text{ " } )}{(\text{ " } )} \times 100$$

$$(\%) = \frac{(\text{ " } )}{(\text{ " } )} \times 100$$

1

[ Mg/Si - Al - ]

200 ml , 53 g 7.8 g 가 , 20  
 % 93 g 가, , 가  
 가 , 1,400 3 . 30µm 가  
 (1) .

[ ]

2,000 ml , 350 g, 106 g 4  
 4.6 g 가 , 2 87.8 g 12 g 가  
 200 g 가 . , (1) 11.2 g 가 ,  
 (磁器) , 5 mm - , 1,200 ml  
 가 , 가 가 400 6  
 (1) (1) ( 가

Mo<sub>12</sub> V<sub>5.5</sub> W<sub>1</sub> Cu<sub>2.2</sub> Sb<sub>0.5</sub> Mg<sub>0.5</sub> Si<sub>0.75</sub> Al<sub>0.05</sub> .

23.4 % .

[ ]

25 mm , (1) 1,000 ml ,  
 5 % , 5.5 % , 25 % 64.5 % ,  
 . 260 , (SV) 1,500 h<sup>-1</sup> (STP) . 8,000  
 1 .

1

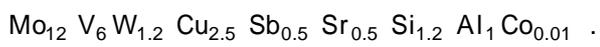
" Mg/Si - Al - " 1 , (1) (2) 1 ,  
 . (2) , 1 (2) 1 1

2

[ Sr/Si - Al - ]

20 % 74.4 g , 10.7 g, 0.6 g 10.5 g 가, ,  
 가 30μm (2) , 1,50  
 0 3 . ,  
 [ ]

2,000 ml , 350 g, 116 g 53  
 .5 g 가 2 99.8 g 12 g 가  
 200 g 가 (2) 28.9 g 가 ,  
 5 mm - 1,200 ml 가 ,  
 - 400 6 (3)  
 (3) :



24.8 % .

[ ]

(1) (3) , 1 . 1

3

[ Ca - Ba/Si - Al - ]

200 ml , 48.8 g, 54 g 0.9 g 가  
 20 % 335 g 33.7 g 가, , 가  
 가 , 1,400 3  
 30μm (3) .

[ ]

2,000 ml , 350 g, 96.6 g  
 44.6 g 가 2 99.8 g 가 200 g  
 (3) 115.5 g 가 ,  
 5 mm - 1,200 ml 가 ,  
 400 6 (4) . (4)  
 :



26.7 % .

[ ]

(1) (4) , 1 . 1  
 .  
 4

[ Mg/Si - Al - ]

400 ml , 12.7 g, 0.2 g 1.0 g 가  
 20 % 220 g 1.8 g 가, , 가  
 . 가 , 1,200 3  
 30µm (4) .

[ ]

2,000 ml , 350 g, 116 g 6  
 7 g 가 , , 2 99.8 g 가 200 g .  
 . , 5 mm - (4) 186 g 가 ,  
 . 400 6 1,200 ml 가 ,  
 (5) : (5) .

Mo<sub>12</sub> V<sub>6</sub> W<sub>1.5</sub> Cu<sub>2.5</sub> Mg<sub>0.2</sub> Si<sub>0.3</sub> Al<sub>0.02</sub> K<sub>0.01</sub> Fe<sub>0.01</sub> .

23.8 % .

[ ]

(1) (5) , 1 . 1  
 .  
 5

[ Mg/Si - ]

Nakarai Tesqu Co. 100 g 1,500 3 (5) .

[ ]

2,000 ml , 350 g, 96.6 g  
 53.5 g 가 , 2 87.8 g, 13.0 g 4.8 g 가  
 , 200 g 가 . , (5) 51.7 g 가  
 , 5 mm -  
 1,200 ml 가 , . , 400 6  
 (6) . (6) :

Mo<sub>12</sub> V<sub>5</sub> W<sub>1.2</sub> Cu<sub>2.2</sub> Sb<sub>0.2</sub> Mg<sub>2.4</sub> Si<sub>3.6</sub> Ti<sub>1</sub> .

25.0 %

[ ]

(1) (6) , 1 . 1

[ 1 ]

			( )	(%)	(%)	(%)
1	(1)	8,000	260 268	99.1 99.2	96.0 95.8	95.1 95.0
1	(2)	8,000	260 291	97.0 97.8	93.8 93.1	91.0 91.1
2	(3)	8,000	260 267	99.6 99.4	95.6 95.4	95.2 94.8
3	(4)	8,000	260 272	99.0 99.0	95.4 95.3	94.4 94.3
4	(5)	8,000	260 271	99.0 99.2	95.8 95.7	94.8 94.9
5	(6)	8,000	260 274	99.1 99.0	95.2 94.9	94.3 94.0

(57)

1.

B C B C

, 1 :

[ 1 ]



[ , Mo ; V ; W ; Cu ; A ,  
 1 ; B 1 ; C , ,  
 1 ; D , , , 1  
 ; E IA IIIb , , , 1  
 ; O ; a, b, c, d, e, f, g, h, i x Mo, V, W, Cu, A, B, C, D, E O  
 ; a=12, 2 ≦ b ≦ 15, 0 ≦ c ≦ 10, 0 < d ≦ 6, 0 ≦ e ≦ 6, 0 < f ≦ 10, 0 < g ≦ 10, 0 ≦ h  
 ≦ 5, 0 ≦ i ≦ 5 , x ]

2.

1 , B 가 , , 1

3.

4.

1 3 , B C 500 2,000 가

5.

1 , -