

.1.

1.

1.

$D_1 = 18 / \dots$; $D_2 = 20 / \dots$

2.

$\rho = 1,0 / \dots$

$\rho = 20:18 = 1,11 / \dots$

3.

4.

$-10^0 + 10^0$

5.

$D_2 + 3,8^0$

$+100^0 - +101,5^0$

6.

10 %

7. 10 %.
8. 2.
9. 1
10. $\rho=0,9$ 20:18= 1,0 /
- 50 % 12,25
- $\cdot^3 \equiv \cdot$
- 1 10

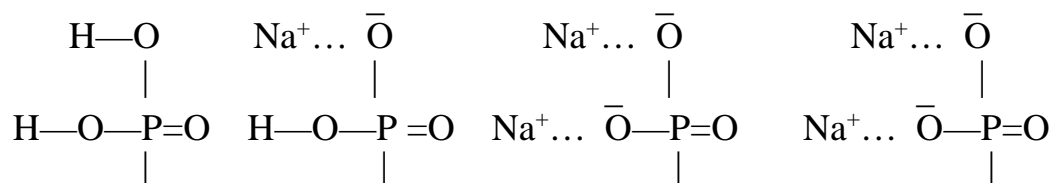
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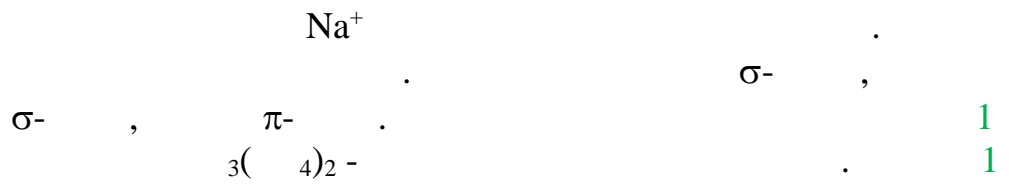
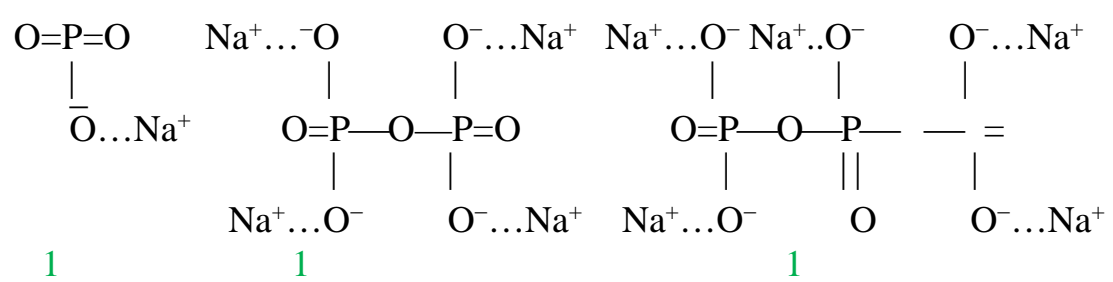
1, 2, 3, 4, 5.

$t=150^0-300^0$

?

- 1) $\text{NaOH} + \text{H}_3\text{PO}_4 = \text{NaH}_2\text{PO}_4 + \text{H}_2\text{O}$ 0,5
- 2) $2 \text{NaOH} + \text{H}_3\text{PO}_4 = \text{Na}_2\text{HPO}_4 + 2 \text{H}_2\text{O}$ 0,5
- 3) $3 \text{NaOH} + \text{H}_3\text{PO}_4 = \text{Na}_3\text{PO}_4 + 3 \text{H}_2\text{O}$ 0,5
- 4) $\text{NaH}_2\text{PO}_4 \xrightarrow{t} \text{NaPO}_3 + \text{H}_2\text{O}$ 0,5
- 5) $2 \text{Na}_2\text{HPO}_4 \xrightarrow{t} \text{Na}_4\text{P}_2\text{O}_7 + \text{H}_2\text{O}$ 0,5
- 6) $\text{Na}_4\text{P}_2\text{O}_7 + \text{NaPO}_3 \xrightarrow{t} \text{Na}_5\text{P}_3\text{O}_{10}$ 0,5





10

3.

$100 \quad 20^0 \quad 122 \quad 34,32 \quad 150^0 \quad 21,65 \quad 58,5$

$91,4 \quad 1,0 \quad ?$

$100 \quad (/ 100 \quad 2)$

$n=0,5 \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot$

$0,5 \quad + \quad 0,5 \quad = \quad 0,5$

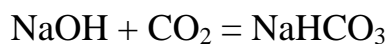
$2 \quad 3 = \quad 2 \quad 3 + \quad 2 + \quad 2$
 $2 \quad 1 \quad 1 \quad 1$

$m(\text{CO}_2 + \text{H}_2\text{O}) = 62$

$$n(\text{CO}_2) = n(\text{H}_2\text{O}) = 12,67 : 62 = 0,2043$$

$$= 21,65 : 0,2043 = 106,0 \text{ g. Na}_2\text{CO}_3 \cdot 10 \text{ H}_2\text{O}$$

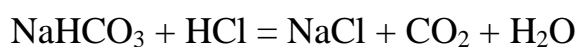
$$20 \text{ g. NaOH} \quad 80 \text{ g.}$$



$$0,5 \text{ mol} \quad 0,5 \text{ mol} \quad 0,5 \text{ mol} \quad m(\text{NaHCO}_3) = 84 \times 0,5 = 42 \text{ g.}$$

$$42,0 - 34,32 = 7,68 \text{ g.}$$

$$K_s = (7,68 : 80) \times 100 = 9,6 \%$$



$$n(\text{HCl}) = 0,0914 \text{ mol.} \quad n(\text{NaHCO}_3) = 0,0914 \text{ mol.} \quad m(\text{NaHCO}_3) = 7,68 \text{ g.}$$

$$21,65 \text{ g.} \quad n = 0,2045 \text{ mol.}$$

$$58,5 \text{ g.} \quad 0,2045 \text{ mol.}$$

$$= 286 \text{ g.}$$

$$106 \text{ g.}$$

$$180 \text{ g.} \cdot 10$$

$$\text{Na}_2\text{CO}_3 \cdot 10 \text{ H}_2\text{O} \quad 1$$

10

4.

4,91

560 (. .)

3,275

280 (. .)

2,54

3,68

(, . .),

4,91

30 %.

D() = 15.

1.

	Al, Be, ...).	:	. (Zn,
	$+ 2\text{NaOH} + 2\text{H}_2\text{O} = \text{Na}_2[\text{(OH)}_4] + \text{H}_2\uparrow$	1	
	560	1,635	
	0,025	0,025	
	$= 1,635 : 0,025 = 65,4 /$		1
	= Zn.		
2.	$\text{Y} + 2\text{HCl} = \text{YCl}_2 + \text{H}_2\uparrow$	1	
	Y 0,735	0,0125	
	280	0,0125	
	Y 0,735	0,0125	
	$\text{Y} = 0,735 : 0,0125 = 58,8 /$		1
	Y=Ni.		
3.	$\text{Z} + 4\text{HNO}_3 = \text{Z}(\text{NO}_3)_2 + 2\text{NO}_2\uparrow + 2\text{H}_2\text{O}$	1	
	0,04	0,08	
	3,68	0,08	
	Z 2,54	0,04	
	$\text{Z} = 2,54 : 0,04 = 63,5 /$		1
	Z=Cu.		
4.	$\omega(\text{Zn})=33,3\% . \omega(\text{Ni})=15,0\% . \omega(\text{Cu})=51,7\% .$		1
5.	$= 30 /$		30% .
	NO.		0,5
	$3\text{Zn} + 8\text{HNO}_3 = 3\text{Zn}(\text{NO}_3)_2 + 2\text{NO}\uparrow + 4\text{H}_2\text{O}$	0,5	
	0,025 mol	0,01667 mol	
	$3\text{Ni} + 8\text{HNO}_3 = 3\text{Ni}(\text{NO}_3)_2 + 2\text{NO}\uparrow + 4\text{H}_2\text{O}$	0,5	
	0,0125	0,00833 mol	
	$3\text{Cu} + 8\text{HNO}_3 = 3\text{Cu}(\text{NO}_3)_2 + 2\text{NO}\uparrow + 4\text{H}_2\text{O}$	0,5	
	0,04	0,02667 mol	
	NO	n=0,05167	
	$V = 22,4 \times 0,05167 = 1,16$		1
			10

5.

() ()

D.

c D,
D -

D

homo sapiens

A, B, C, D.

?

?

D, 2 N₂

?

,

.

.

-
D -

, 2 .

,

SiO₂. 1

,

,

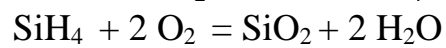
1

, , Si.

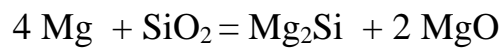
2

SiH₄. M = 32 /

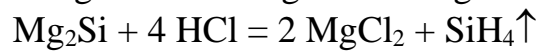
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1



1



1

:

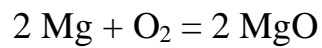
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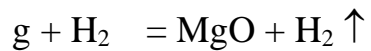
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1

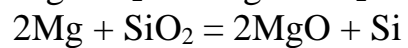
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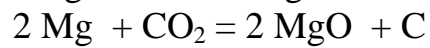
0,5



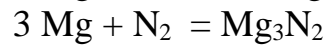
0,5



0,5



0,5



0,5

0,5

.2.

1.

3.

1.

$2 - = 18 / ; 2 - = 22 / .$

2.

$18 . \rho=1,0 / .$

$\rho= 22:18 = 1,22 / .$

3.

4.

$-10^0 + 10^0 .$

5.

$0^0 .$

$+100^0 .$

6.

22 %

7. 22 %.
8. 2.
9. 1
10. $\rho=0,9$ 22:18= 1,1 /
- 50 % 12,25
- 1 10

2.

1, 2, 3, 5.

$$t=150^0-300^0$$

3,386 %.

?

?

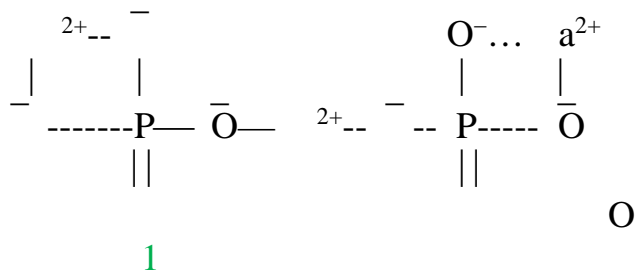
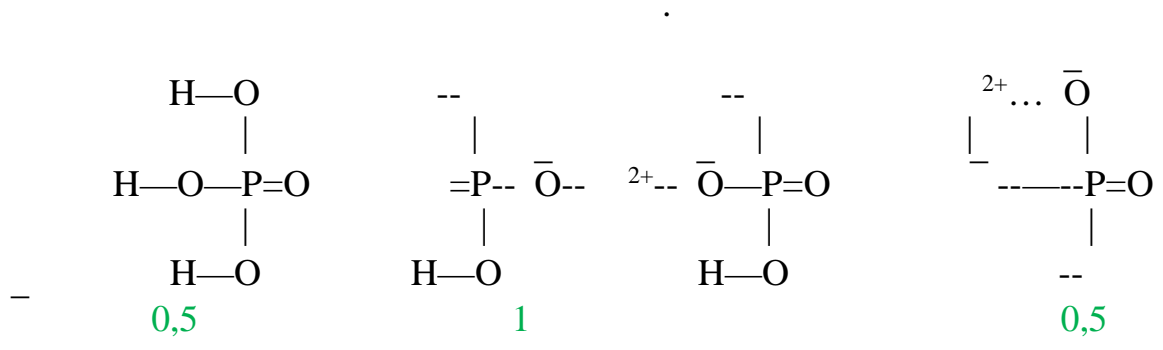
- 1) $a(O)_2 + 2 H_3PO_4 = a(H_2PO_4)_2 + 2H_2O$ 0,5
- 2) $a(OH)_2 + H_3PO_4 = aHPO_4 + 2 H_2O$ 0,5
- 3) $3 a(OH)_2 + 2H_3PO_4 = a_3(PO_4)_2 + 6 H_2O$ 0,5
- 4) $2 aHPO_4 = a_2 a_2 + H_2O$ 0,5
- 5) $5 ()_2 + 3 a_3 a_4 = a_5(PO_4)_3 + 9H_2O$ 1

$$\omega() = 3,386 \% \quad = 17:0,03386 = 502 / \quad 1$$

$$502-17=485.$$

$$20 - \quad ()_4 = 95.$$

1,3,5. 3 4. 5. 1



10

3.

100	20 ⁰
150 ⁰	122
17,73	25,70
243	21,2
100	1,0 /
(/ 100 2)	?
	20 ⁰
	n=0,5
	1

$$0,5 + 0,5 = 0,5 \quad 1$$

$$\frac{2}{2} = \frac{3}{1} + \frac{25,70}{1} + \frac{2}{1} \quad 1$$

$m(\text{CO}_2 + \text{H}_2\text{O}) = 62 \cdot 7,97$

$$n(\text{CO}_2) = n(\text{H}_2\text{O}) = 12,67 : 62 = 0,1285 \quad 1$$

$$0,1285 \cdot 17,73 = 2,26 \quad 1$$

$$= 17,73 : 0,1285 = 138,0 \quad \text{CO}_3 \quad 1$$

$$\text{OH} \quad 0,5 \quad 1$$

$$28 \quad 72 \quad 1$$

$$\text{OH} + \text{CO}_2 = \text{HCO}_3$$

$$0,5 \quad 0,5 \quad 0,5 \text{ mol} \quad m(\text{HCO}_3) = 100 \times 0,5 = 50 \text{ g} \quad 1$$

$$50,0 - 25,70 = 24,30$$

$$K_s = (24,3 : 72) \times 100 = 33,7 \quad 1$$

$$\text{HCO}_3 + \text{HCl} = \text{Cl} + \text{CO}_2 + \text{H}_2\text{O}$$

$$n(\text{HCl}) = 0,243 \text{ mol} \quad n(\text{HCO}_3) = 0,243 \text{ mol} \quad m(\text{HCO}_3) = 24,3 \text{ g} \quad 1$$

$$17,73 \quad n = 0,1285 \text{ mol}$$

$$21,2 \quad 0,1285$$

$$= 165 /$$

$$138 /$$

$$27 \cdot 1,5$$

$$\text{CO}_3 \cdot 1,5 \text{ H}_2\text{O} \quad 1$$

10

4.

10,0

445,3 (. .)

8,70

1181 (. .)

5,60

8,11 , .

(, . .),

10,0 30 %.

D(2) = 15.

1. . (Zn, Al, Be, ...).

$$+ 2\text{NaOH} + 2 \text{H}_2\text{O} = \text{Na}_2[(\text{OH})_4] + \text{H}_2\uparrow$$

1,30 .

445,3 . 0,01988 .

0,01988 .

=1,3:0,01988 = 65,4 / . = Zn. 1

2. Y + 2 HCl = YCl₂ + H₂↑ 1

Y 3,1 .

1181 . 0,05272 .

Y 3,1 . 0,05272 .

Y =3,1: 0,05272 = 58,8 / . 1

Y=Ni.

3. Z + 4 HNO₃ = Z(NO₃)₂ + 2 NO₂↑ + 2 H₂O 1

0,08819 0,1763

8,11 . 0,1763 .

Z 5,6 . 0,08819 .

Z = 5,6 : 0,08819 = 63,5 / . 1

Z=Cu.

4. . ω(Zn)=13,0 % . ω(Ni)=31,0% . ω(Cu)=56,0%. 1

5. 30 %.

=30 / . NO. 0,5

$$3 \text{Zn} + 8 \text{HNO}_3 = 3 \text{Zn}(\text{NO}_3)_2 + 2 \text{NO} \uparrow + 4 \text{H}_2\text{O}$$

0,01988 mol 0,01325 mol 0,5

$$3 \text{Ni} + 8 \text{HNO}_3 = 3 \text{Ni}(\text{NO}_3)_2 + 2 \text{NO} \uparrow + 4 \text{H}_2\text{O}$$

0,05272 0,03515 mol 0,5

$$3 \text{Cu} + 8 \text{HNO}_3 = 3 \text{Cu}(\text{NO}_3)_2 + 2 \text{NO} \uparrow + 4 \text{H}_2\text{O}$$

0,08819 0,05879 mol 0,5

NO n=0,1072 .

V=22,4 × 0,1072=2,40 . 1

5.

() () 16.

D.

70°

35,0 %.

4

2

6,18

2,0

9,535

380°

5,03

c

D,

D -

A, B, C, D,

?

2.

16

1

16

8

NH

N₂H₂.

2

2 4 -

3

2 6 -

1

2 6 + 3

2 =

2 3 + 3

2

2 3,

0,5

2 3 + 3

2 =

2 3 3

-

3 3 0,5

3

3 =

2 + 2

-

2

3

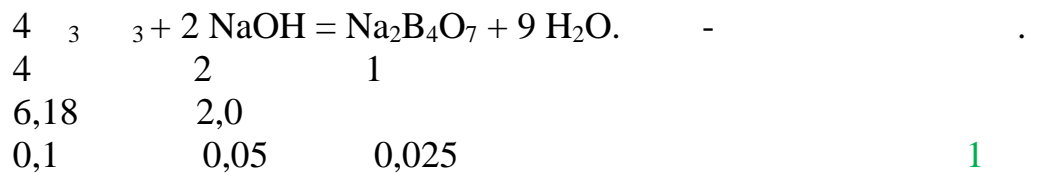
3 + NaOH = NaBO₂ + 2 H₂O

-

NaBO₂.1

35,0 %.

:



1
9,535 .

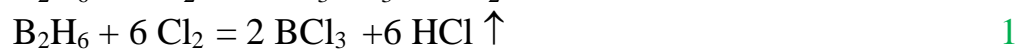
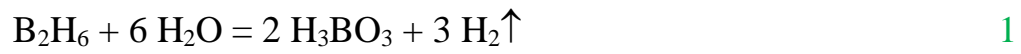
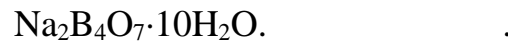
$$9,535:0,025=381,4 / \quad . \quad 1$$

5,03 .

$$5,03:0,025=201,2 / \quad .$$

180,2 .

10. 1



D - , 2 .

1