10

10-1

1. 1) $3Na_2CO_3 + 12HF + 2Al(OH)_3 = 2\ Na_3[AlF_6] + 3CO_2 + 9H_2O$

,

.

2) $2Al_2O_3 = \cdot\quad 4Al + 3O_2$

2. 100 80 .

$n(Na_3[AlF_6] =80000\ :210\ /\quad = 381$.

:

$n(HF) =6n(Na_3[AlF_6]) \cdot1,2 = 381\cdot6\cdot1,2 = 2743$

$m(HF) = 2743\quad \cdot19$ **г/моль** $= 54900$ **г** $= 54,9$ **кг**

$m_{p-pa} = 54,9\quad :0,4 =137$

$V_{p-pa} = 137\quad :1,13\ /\ = 121$

3.

$m(Al_2O_3) = m(\qquad)\cdot\omega(Al_2O_3) = 100\cdot0,05=5$

$n(Al_2O_3) = 5000\ :102\ /\quad = 49$.

$n(Al) = 98\qquad m(Al) = n(Al)\cdot\quad\cdot\eta = 98\cdot27\cdot0,75 = 1,95$.

1. 1 - 3
2. - 3
3. 2 - 1
4. - 2
5. - 2

: 11

10-2 (. **.)**

- , .

) .

)) –

.

)

, .

3- 3- 2- (3)− 2 − 3 ,
1,2,3- .

H$_3$C

H$_3$C CH$_3$

$C_6H_{12} + Br_2 = C_6H_{12}\ Br_2$ 3- (Br)- (3) − (Br) − 3
$C_6H_{12} + HI = C_6H_{13}I$ 3- 2- (3) − I − 3
$C_6H_{12} + H_2 = C_6H_{14}$ 3- 2- (3) − 2− 3
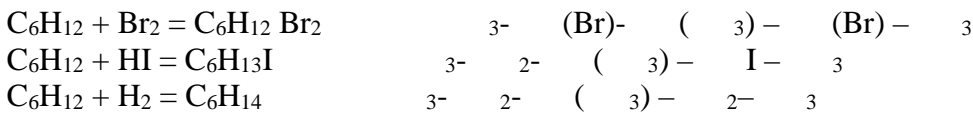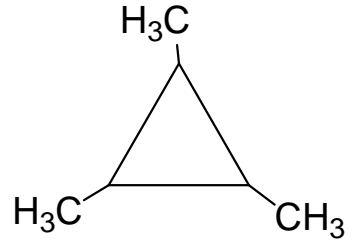
1. C_6H_{12} - 3
2. - 2
3. 1 - 3
4. 1 - 3

10-3

$$: \quad 2 \ _2 \ = 2 \ _2 + \ _2$$

,   -

$$: n(H_2) = \frac{PV}{RT} = \frac{2{,}03 \cdot 10^5 \cdot 153 \cdot 10^{-3}}{8{,}31 \cdot 373} = 10$$

, n(H₂O) = 10   .

188   «   » 160   28   .

n(   ) = 20   .

n(   ) = x $2 \ +1 \cdot (20- \ ) = 28$,   = 8.

20-8=12,   H : D = 12 : 8 = 3 : 2.

1.   - 1
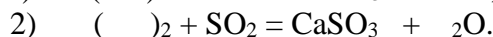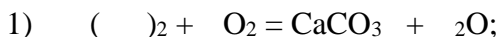2.   - 1
3.   - 3

: 5

10-4

$$n(HCl) = CV = 1 \qquad / \cdot 0{,}125 \ = 0{,}125$$

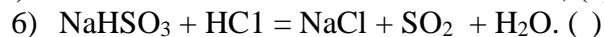$$n(NaCl) = \frac{m}{M} = \frac{2{,}925}{58{,}5 \ /} = 0{,}05$$

(   )   ,

:

1)   (   )₂ +   O₂ = CaCO₃ +   ₂O;

2)   (   )₂ + SO₂ = CaSO₃ +   ₂O.

                                                            : Na₂SO₃; NaHSO₃; Na₂CO₃;

NaHCO₃:

3) Na₂CO₃ + 2HCl = 2NaCl + CO₂ + H₂O; (a)

4) NaHCO₃ + HCl = NaCl + CO₂ + H₂O; ( )

5) Na₂SO₃ + 2   1 = 2NaCl + SO₂ + H₂O; ( )

6) NaHSO₃ + HCl = NaCl + SO₂ + H₂O. ( )
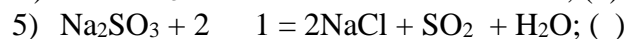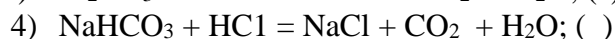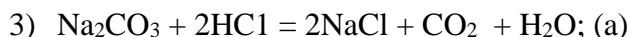
                                                                                                0,05

.

                                        = n·

(CO₂) = 44 (/   )·0,025   = 1,1 ; ( )

(CO₂) = 44 (/   )·0,05   = 2,2 ; ( )

(SO₂) = 64 (/   )·0,025   = 1,6 ; ( )

(SO₂) = 64 (/   )·0,05 (   ) = 3,2 . ( )

            ( ).   ,   - Na₂CO₃,   - O₂:

Na₂CO₃ + 2HCl = 2NaCl + CO₂ + H₂O.

                            (0,5   )

    ;   ,   44 /   .

                                : C₃H₈   N₂O.

        (I)

.

            ,   - N₂O.   ,

    0₂   N₂0,   - Na₂N₂O₂ (-

).

:

$$Na_2N_2O_2 + 2HCl = 2NaCl + N_2O + H_2O.$$

. $- Na_2CO_3$; $- Na_2N_2O_2$; $-$ $_2$; $- N_2O$.

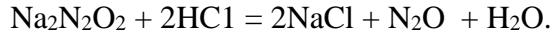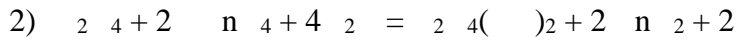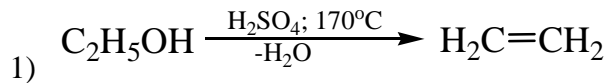1.   ,   1   - 3
2.   - 3
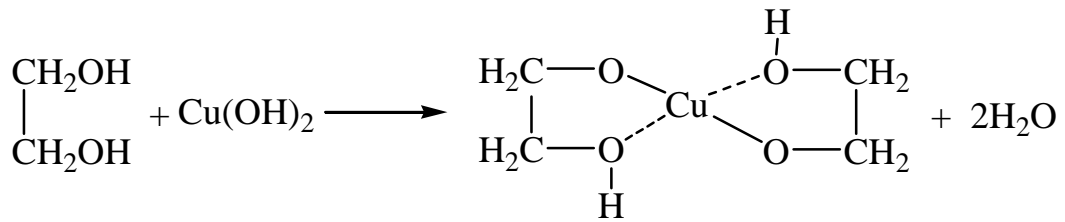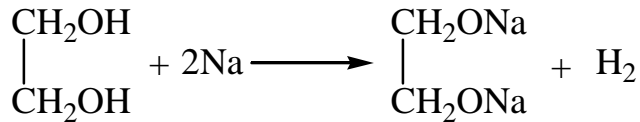3.   ,   - 4
4.   1-6   0,5   -3
5.   0,5 $-$ 1
   : 14

10-5

:

1) $C_2H_5OH \xrightarrow[-H_2O]{H_2SO_4;\ 170^oC} H_2C{=}CH_2$

2) $_2$ $_4 + 2$ n $_4 + 4$ $_2$ $=$ $_2$ $_4($ $)_2 + 2$ n $_2 + 2$

                                                                (II)   :

3)

$$\begin{matrix} CH_2OH \\ | \\ CH_2OH \end{matrix} + Cu(OH)_2 \longrightarrow \begin{matrix} & & & H \\ & & & | \\ H_2C{-}O & & O{-}CH_2 \\ | & \diagdown Cu \diagup & | \\ H_2C{-}O & & O{-}CH_2 \\ | & & \\ H & & \end{matrix} + 2H_2O$$

4)

$$\begin{matrix} CH_2OH \\ | \\ CH_2OH \end{matrix} + 2Na \longrightarrow \begin{matrix} CH_2ONa \\ | \\ CH_2ONa \end{matrix} + H_2$$

$$n(H_2) = \frac{V}{Vm} = \frac{33,6}{22,4 \ /} = 1,5$$

$$n_{(C_2H_4(OH)_2)} = \frac{1,5}{0,7 \cdot 0,7} = 3,06 \qquad m(C_2H_4(OH)_2) = 3,06 \qquad \cdot 62 \ / \qquad = 18,97 \ \approx 19$$

1.   - 2
2.   1   4   1   - 2
3.   2   3   2   - 4
4.   -1
   : 9