

1	2	3	4	5	6	7	8	9	10	Σ
5,5	9	1	2	5	10	7,5	6	14	3	57

(Handwritten signature)

Задача 1.1.

$$w(\text{Zn}) \text{ в } \text{ZnS} = \frac{65,37}{97,434} = 0,6709 (67,09\%)$$

$$m(\text{ZnS}) = 500 \cdot 0,2 = 100 \text{ г}$$

$$m(\text{Zn}) = 100 \cdot 0,6709 = 67,09 \text{ г.}$$

$$\cancel{w(\text{Zn}) \text{ в } \text{ZnS}} \quad w(\text{Zn}) \text{ в сертифицированном} = \frac{130,74}{417,045} = 0,3135 (31,35\%)$$

$$m(\text{Zn}) = 500 \cdot 0,7 \cdot 0,3135 = 109,725 \text{ г}$$

$$w(\text{Zn}) \text{ в пороге} = \frac{67,09 + 109,725}{500} = 0,3536 (35,36\%)$$

5,5 округлил!

Задача 3.1.

$$M_{\text{сметан}} = 0,839 \cdot 29 = 24,331 \text{ г/моль}$$

18

$$M_{\text{ср}} = M_1 \cdot \varphi_1 + M_2 \cdot \varphi_2 + M_3 \cdot \varphi_3$$

$$\varphi(\text{HCl}) = \frac{16}{10,25} = \frac{2}{4} = 0,2857 (28,57\%) \quad \text{см. далее}$$



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пусть x - объёмная доля азота, тогда:

$$24,331 = 36,5 \cdot \frac{2}{4} + 28x + 14(1 - \frac{2}{4} - x)$$

$$x = 0,16, \quad \varphi(\text{NH}_3) = 1 - \frac{2}{4} - 0,16 = 0,5543$$

$$V(\text{N}_2) = 0,16 \cdot 35 = 5,6 \text{ л}$$

$$V(\text{NH}_3) = 0,5543 \cdot 35 = 19,4 \text{ л}$$

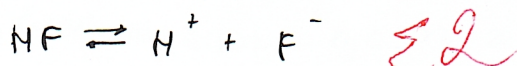
$$\varphi(\text{N}_2) \text{ в иск. смеси} = \frac{5,6}{25} = 0,224 (22,4\%)$$

$$\varphi(\text{NH}_3) \text{ в иск. смеси} = \frac{19,4}{25} = 0,776 (77,6\%)$$

Задача 4.1.

$$C = \frac{n}{V}, \quad n(\text{HF}) = CV = 0,5 \cdot 0,2 = 0,1 \text{ моль}$$

$$N_{\text{ион. HF}} = n \cdot N_A = 0,1 \cdot 6,02 \cdot 10^{23} = 6,02 \cdot 10^{22}$$



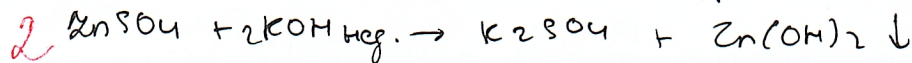
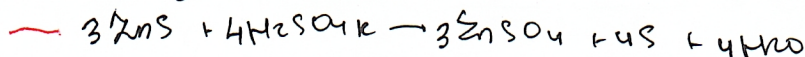
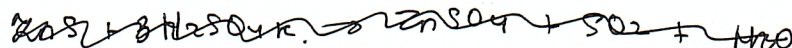
$$N_{\text{ионов}} = 6,02 \cdot 10^{22} \cdot 2 = 1,204 \cdot 10^{23}$$

$$\alpha (\text{степень дисс}) = \frac{(1,204 \cdot 10^{23} + 6,02 \cdot 10^{22}) - 6,5 \cdot 10^{22}}{1,204 \cdot 10^{23} + 6,02 \cdot 10^{22}} = 0,64 (64\%)$$

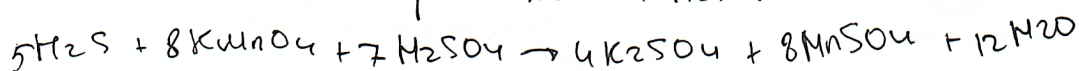
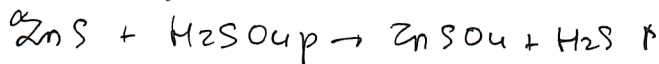
Задача 5.1

Р-р-ы: $\text{H}_2\text{SO}_4\text{p}$, $\text{H}_2\text{SO}_4\text{к}$, KOH , KMnO_4

1) ~~$\text{ZnS} + \text{KMnO}_4$~~



2) ~~ZnSO_4~~



3

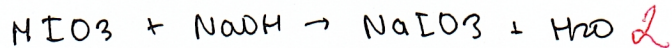
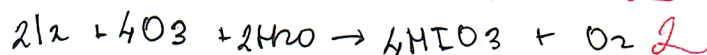
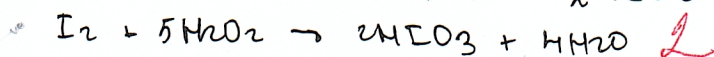
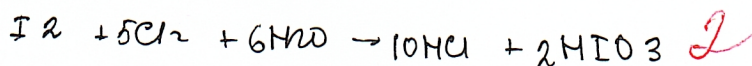
§ 5



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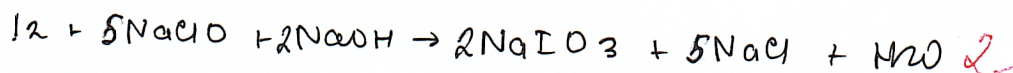
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задача 6.1.



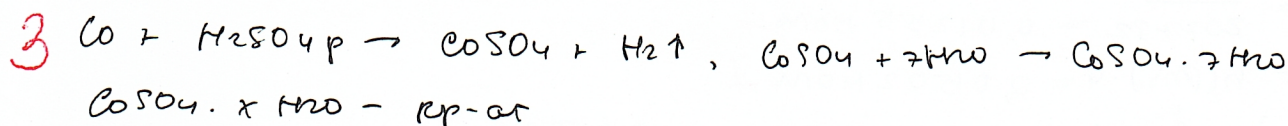
$\Sigma 10$

1.01



0.109

задача 7.1



составим ур-ие:

$$\frac{40}{80} = \frac{1}{2}$$

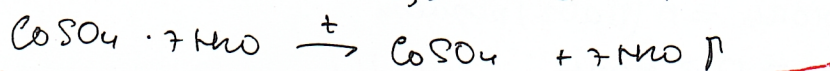
$$3 \quad \frac{64 + 16x}{2x} = 12,57 \Rightarrow x = 7$$

$CoSO_4 \cdot 7H_2O$ - искомого кр-ат

1,5

$$n_{\text{паров}} = \frac{pV}{RT} = \frac{101,325 \cdot 4,4}{8,314 \cdot 298} = 0,18 \text{ моль} - H_2O$$

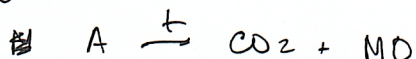
$\Sigma 7,5$



$$w(H_2O) \text{ в кр-те} = \frac{126}{281} = 0,4484 (44,84\%)$$

$$m(H_2O) = 0,18 \cdot 18 = 3,24 \text{ г} \Rightarrow m_{\text{кр-та}} = \frac{3,24}{0,4484} = 7,2257 \text{ г.}$$

задача 8.1



$\Rightarrow A$ - нераств. карбонат (MCO_3)

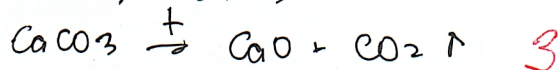
$$m(CO_2) = 1,25 - 0,7 = 0,55 \text{ г}$$

$$w(CO_2) \text{ в } MCO_3 = \frac{0,55}{1,25} = 0,44 (44\%)$$

$$44\% - 44 \text{ моль}$$

$$100\% - x \quad | \quad x = 100 \text{ моль} = w(MCO_3)$$

$\Rightarrow A - CaCO_3$

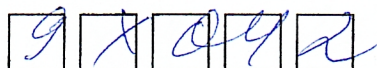


Искомого в-ва - $Ca(MCO_3)_2$ и $(CaOH)_2CO_3$

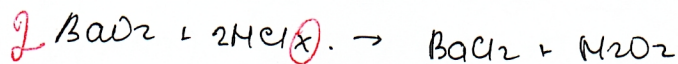
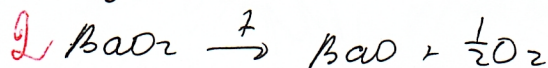
$\Sigma 6$



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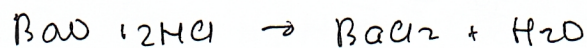
Задача 9.1



$$n(\text{PbS}) = \frac{3}{207 + 32} = 0,01255 \text{ моль}$$

$$n(\text{HNO}_3) = n(\text{PbS}) \cdot 4 = 0,0502 \text{ моль}$$

$$n(\text{BaO}_2) = 2 n(\text{HNO}_3) = 0,1004 \text{ моль}$$



$$n(\text{HCl}) = \frac{73 \cdot 0,2}{36,5} = 0,4 \text{ моль}$$

$$n(\text{HCl}) \text{ на } \text{BaO}_2 = 0,0502 \cdot 2 = 0,1004 \text{ моль}$$

$$n(\text{HCl}) \text{ на } \text{BaO} = 0,4 - 0,1 = 0,3 \text{ моль}$$

$$\Rightarrow n(\text{BaO}) = 0,3 : 2 = 0,15 \text{ моль} = n(\text{BaO}_2) \text{ разлож.}$$

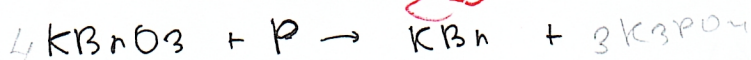
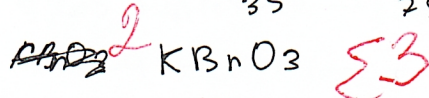
$$n(\text{BaO}_2)_{\text{ущ.мат.}} = 0,15 + 0,05 = 0,2 \text{ моль}$$

$$\text{степ. терм. разлож.} = \frac{0,15}{0,2} = 0,75 (75\%)$$

Σ 14

Задача 10.1.

$$\text{KxByOz} \quad \frac{43,35}{39} : \frac{47,91}{79} : \frac{28,74}{16} = 0,5987 : 0,5999 : 1,8 = 1 : 1 : 3$$



$$n(\text{KBrO}_3) = \frac{8,35}{167} = 0,05 \text{ моль}$$

$$n(\text{P}) = \frac{1,86}{31} = 0,06 \text{ моль}$$



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задача 2.1.

18-60 - А

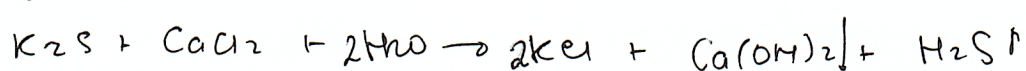
28-60 - В

3

$$\text{мкр} - 155 + 126 = 281$$

А - K_2S

В - $CaCl_2$



$$\begin{array}{r} 3,24 - 126 \\ \times - 201 \\ \hline \end{array}$$

$$\left. \begin{array}{l} K^+ - 19p^+, 18e^- \\ S^{2-} - 16p^+, 18e^- \end{array} \right\} 19 - 16 = 3$$

$$7,225 \text{ г}$$

$$\left. \begin{array}{l} Ca^{2+} - 20p^+, 18e^- \\ Cl^- - 17p^+, 18e^- \end{array} \right\} 20 - 17 = 3$$



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