Задача №1.

$$2Al + 6HCl \rightarrow 2AlCl_3 + 3H_2\uparrow$$
$$Me + 2HCl \rightarrow MeCl_2 + H_2\uparrow$$

$n(H_2) = \frac{24,64\ л}{22,4\ л/моль} = 1,1\ моль$

$$\begin{cases} y = 1.25x \\ 1,5x + y = 1,1\ моль \end{cases}$$

$1,5x + 1,25x = 1,1$

$1,75x = 1,1$

$x = 0,628$

$y = 1,25 \cdot 0,62 = 0,775\ моль$

Задача 2

1. $\omega(S) = 100\% - 86,62\% = 13,38\% = 0,1338$

$Mr(MeS) = \frac{32\ г}{0,1338} = 239\ г/моль$

$Mr(Me) = 239\ г/моль - 32\ г/моль = 207\ г/моль - Pb$

X – Pb ; A – PbS

2. $PbS + 2H_2O_2 \rightarrow PbSO_4 + 2H_2\uparrow$

3. $n(PbSO_4) = \frac{0,00322\ г}{303\ г/моль} = 1,05 \cdot 10^{-5}\ моль$ — $100\ мл\ H_2O$ — $\frac{100\ мл}{1000\ мл} = 0,1\ л$

$n(PbSO_4) = \frac{1,05 \cdot 10^{-5}\ моль}{x\ моль} = \frac{0,1\ л}{1\ л} = \frac{1,05 \cdot 10^{-5}\ моль}{0,1\ л} = 1,05 \cdot 10^{-4}\ моль$

4.

Задача 3

1. $\overset{0}{I_2} + 2\overset{+}{Na_2}\overset{2+}{S_2}\overset{2-}{O_3} \rightarrow 2\overset{+}{Na}\overset{-}{I} + \overset{+}{Na_2}S_4\overset{2-}{O_6}$

$I_2^0 + 2\bar{e} \rightarrow 2I^-$ | $2\bar{e}$ | 1

$S^{2+} - 1\bar{e} \rightarrow S^{3+}$ | $1\bar{e}$ | 2

2. $5\overset{+}{Na}\overset{-}{Br} + \overset{+}{Na}\overset{5+}{Br}\overset{2-}{O_3} + 3\overset{+}{H_2}\overset{6+}{S}\overset{2-}{O_4} \rightarrow 3\overset{+}{Na_2}\overset{6+}{S}\overset{2-}{O_4} + 3Br_2^0\uparrow + 3\overset{+}{H_2}\overset{2-}{O}$

$2Br^- - 2\bar{e} \rightarrow Br_2^0$ | $2\bar{e}$ | 5

$2Br^{5+} + 10\bar{e} \rightarrow Br_2^0$ | $10\bar{e}$ | 1

3. $2\overset{+}{K}\overset{3+}{Cr}\overset{2-}{O_2} + 3Cl_2^0 + 8\overset{+}{K}OH \rightarrow 2\overset{+}{K_2}\overset{6+}{Cr}\overset{2-}{O_4} + 6\overset{+}{K}Cl^- + 4\overset{+}{H_2}O^{2-}$

$Cr^{3+} - 3\bar{e} \rightarrow Cr^{6+}$ | $3\bar{e}$ | 6 | 2

$Cl_2^0 + 2\bar{e} \rightarrow 2Cl^-$ | $2\bar{e}$ | | 3

4. $2\overset{3+}{Cr}Cl_3^- + 3\overset{+}{K}\overset{5+}{N}\overset{2-}{O_3} + 5K_2\overset{4+}{C}\overset{2-}{O_3} \rightarrow 2\overset{+}{K_2}\overset{6+}{Cr}O_4^{2-} + 3\overset{+}{K}\overset{3+}{N}\overset{2-}{O_2} + 5\overset{4+}{C}\overset{2-}{O_2}\uparrow + 6\overset{+}{K}Cl^-$

$Cr^{3+} - 3\bar{e} \rightarrow Cr^{6+}$ | $3\bar{e}$ | 2

$N^{5+} + 2\bar{e} \rightarrow N^{3+}$ | $2\bar{e}$ | 3

5. $\overset{2-}{C_3}\overset{+}{H_{10}}\overset{3-}{N} + \overset{+}{H}\overset{5+}{N}\overset{2-}{O_3} \rightarrow \overset{4+}{C}O_2^{2-} + \overset{+}{H_2}O^{2-} + \overset{4+}{N}O_2^{2-} + N_2^0$

~~$N^{3-} - 7\bar{e} \rightarrow N^{4+}$~~ $2N^{3-} - 6\bar{e} \rightarrow N_2^0$ } | $12\bar{e}$ | $12\bar{e}$

$C^{2-} - 6\bar{e} \rightarrow C^{4+}$

$N^{5+} + 1\bar{e} \rightarrow N^{4+}$ | $1\bar{e}$

Задача 4 — 200г

1. $\omega(MgCl_2)_{80°C} = \frac{65,8г}{65,8г + 100г} \cdot 100\% = 39,68\%$ ✓ $35,4 < 39,68 < 46,79$

$\omega(MgCl_2)_{20°C} = \frac{54,8г}{54,8г + 100г} \cdot 100\% = 35,4\%$

$\omega(MgCl_2)_{MgCl_2 \cdot 6H_2O} = \frac{95 г/моль}{95 г/моль + 108} \cdot 100\% = 46,79\%$ — x г

35,4% \ 39,68% / 7,11г

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46,79% / \ 4,28г — x г

11,39г — 200г

$11,39x = 856$

$x = \frac{856}{11,39} = 75,15$ г

2. ~~$MgCl_2 \cdot 6H_2O \xrightarrow{t^\circ} MgCl_2 + 6H_2O$~~

~~$\omega(MgCl_2$~~ $\omega(MgCl_2) = \frac{35,5 г/моль \cdot 2 моль}{95 г/моль} \cdot 100\% = 74,73\%$