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Женя
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1.1



$$\begin{cases} y = z \\ y = 2y \\ x = 3y \\ x + y + z + y = 22 \end{cases}$$

$$3y + y + y + 0,5y = 22$$

$$5,5y = 22 \quad | : 5,5$$

$$y = 4$$

$$y = z$$

$$z = 4$$

$$x = 3y$$

$$x = 3 \cdot 4$$

$$x = 12$$

$$y = 0,5z$$

$$y = 0,5 \cdot 4$$

$$y = 2$$

$$\begin{cases} x = 12 \\ y = 4 \\ z = 4 \\ y = 2 \end{cases} \Rightarrow C_{12} H_4 Cl_4 O_2$$

Ответ: $C_{12} H_4 Cl_4 O_2$

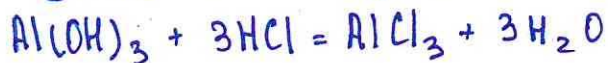
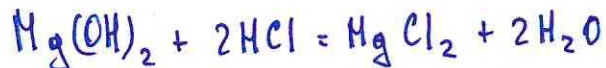
3.1

$$n(Mg(OH)_2) = x \text{ моль}$$

$$n(Al(OH)_3) = y \text{ моль}$$

$$m(Mg(OH)_2) = (58x) \text{ г}$$

$$m(Al(OH)_3) = (78y) \text{ г}$$



$$m_p(HCl) = 3193,54 \text{ г}$$

$$\omega = 12\%$$

$$m_g = m_p \cdot \omega$$

$$m_g(HCl) = 3193,54 \cdot 0,12 = 383,23 \text{ г}$$

$$n(HCl) = \frac{m}{M} = \frac{383,23}{36,5} \approx 10,5 \text{ моль}$$



Пусть x моль катионов в-ва HCl, прореагировавшие с $Mg(OH)_2$. Тогда $(10,5 - x)$ моль катионов в-ва HCl в реакции с $Al(OH)_3$.

$$\begin{cases} x = \frac{z}{2} \\ y = \frac{10,5 - z}{3} \\ 58x + 78y = 282 \end{cases}$$

$$\frac{58z}{2} + \frac{819 - 78z}{3} = 282$$

$$\frac{144z + 1638 - 156z}{6} = 282 \cdot 6$$

$$18z = 1692 - 1638$$

$$18z = 54 : 18$$

$$z = 3$$

$$x = \frac{z}{2}$$

$$x = 1,5$$

$$y = \frac{10,5 - z}{3}$$

$$y = \frac{7,5}{3}$$

$$y = 2,5$$

$$\begin{cases} x = 1,5 \\ y = 2,5 \\ z = 3 \end{cases}$$

↓

$$m = n \cdot M$$

$$m(Mg(OH)_2) = 58 \cdot x = 58 \cdot 1,5 = 87g$$

$$m(Al(OH)_3) = 78 \cdot y = 78 \cdot 2,5 = 195g$$

$$\omega(Mg(OH)_2) = \frac{m}{m_{\text{см}}} = \frac{87g}{282g} \cdot 100\% \approx 30,8\%$$

$$\omega(Al(OH)_3) = 100\% - \omega(Mg(OH)_2) = 100\% - 30,85\% = 69,15\%$$

Ответ: $\omega(Mg(OH)_2) = 30,85\%$;
 $\omega(Al(OH)_3) = 69,15\%$

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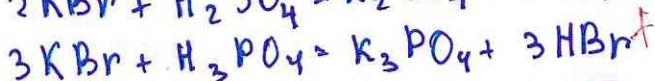
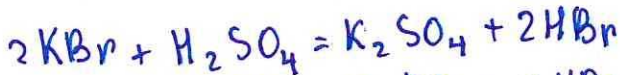
4.1

$$M(H_3PO_4) = 31 + 64 + 3 = 98 \frac{г}{моль}$$

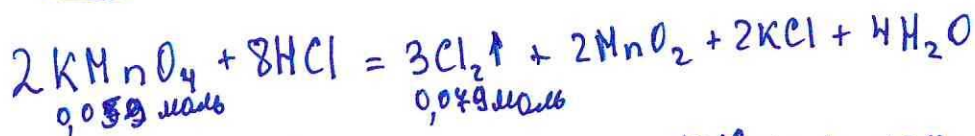
$$M(H_2SO_4) = 32 + 64 + 2 = 98 \frac{г}{моль}$$

$$98 = 98$$

$$n(H_3PO_4) = n(H_2SO_4)$$

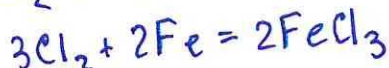
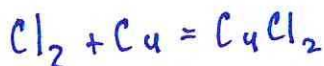


8.1



$$m(\text{KMnO}_4) = 6,32 \text{ г}$$

$$n = \frac{m}{M} = \frac{6,32}{158} = 0,059 \text{ моль}$$



$$n(\text{Cu}) = x \text{ моль}$$

$$n(\text{Fe}) = y \text{ моль}$$

$$m(\text{Cu}) = (64x) \text{ г}$$

$$m(\text{Fe}) = (56y) \text{ г}$$

$$n(\text{Cl}_2) = 0,049 \text{ моль}$$

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Пусть $(0,049 - z)$ моль - кол-во в-ва Cl_2 в реакции с Cu , а z моль - кол-во в-ва в реакции с Fe .

$$\begin{cases} 2y = 3z \\ x = 0,049 - z \\ 64x + 56y = 6 \end{cases}$$

$$5,056 - 64z + 84z = 6$$

$$20z = 0,944$$

$$z = 0,0472$$

$$\begin{cases} x = 0,0318 \\ y = 0,0408 \\ z = 0,0472 \end{cases}$$

$$m(\text{Cu}) = 64x = 64 \cdot 0,0318 = 2,0352 \text{ г}$$

$$\omega(\text{Cu}) = \frac{2,0352 \text{ г}}{6 \text{ г}} \cdot 100\% = 33,92\%$$

Ответ: 33,92% —

