

Oppgave 1a

1 mol er definert som antallet atomer i 12 g C-12.

$$1 \text{ mol} = N_A (\text{Avogadros tall}) = 6,022 \cdot 10^{23}$$

Oppgave 1b

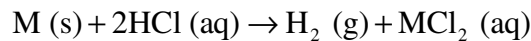
$$m_{Al} = n_{Al} \cdot M_{m_{Al}} = 2n_{Al_2O_3} \cdot M_{m_{Al}} = \frac{m_{Al_2O_3}}{M_{m_{Al_2O_3}}} \cdot M_{m_{Al}} = \frac{25,5 \cdot 10^3}{2 \cdot 26,98 + 3 \cdot 16,00} \cdot 26,98 = 6748 = \underline{\underline{6,75 \text{ kg}}}$$

Oppgave 1c

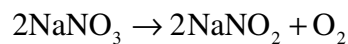
$$m_S = n_S \cdot M_{m_S} = n_{BaSO_4} \cdot M_{m_S} = \frac{m_{BaSO_4}}{M_{m_{BaSO_4}}} \cdot M_{m_S} = \frac{35,0}{137,32 + 32,07 + 4 \cdot 16,00} \cdot 32,07 = \underline{\underline{4,81 \text{ g}}}$$

Oppgave 1d

$$n_C = 6n_{K_4[Fe(CN)_6]} = 6 \cdot 0,420 = \underline{\underline{2,520 \text{ mol}}}$$

Oppgave 2

$$\begin{aligned} M_{m_{M(s)}} &= \frac{m_{M(s)}}{n_{M(s)}} = \frac{m_{MCl_2} - m_{Cl_2}}{n_{M(s)}} = \frac{m_{MCl_2} - M_{m_{Cl}} \cdot n_{Cl}}{n_{M(s)}} = \frac{m_{MCl_2} - M_{m_{Cl}} \cdot 2n_{M(s)}}{n_{M(s)}} \\ &= \frac{0,9165 - 35,45 \cdot 2 \cdot 5,000 \cdot 10^{-3}}{5,000 \cdot 10^{-3}} = 112,4 \frac{\text{g}}{\text{mol}} \end{aligned} \text{): Cd, kadmium}$$

Oppgave 3

$$m_{NaNO_2} = \frac{n_{NaNO_2}}{M_{m_{NaNO_2}}} = \frac{2n_{O_2}}{M_{m_{NaNO_2}}} = \frac{2 \cdot \frac{m_{O_2}}{M_{m_{O_2}}}}{M_{m_{NaNO_2}}} = \frac{2 \cdot \frac{5,29}{2 \cdot 16,00}}{23,00 + 14,01 + 2 \cdot 16,00} = \underline{\underline{4,8 \cdot 10^{-3} \text{ g}}}$$

Oppgave 4

Vektprosent i oksalsyre: $m_{\%C} = 26,7$; $m_{\%H} = 2,2$; $m_{\%O} = 71,1$

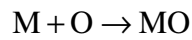
$$M_{m_{\text{okalsyre}}} = 90$$

$$n_C = \frac{M_{m_{\text{okalsyre}}} \cdot \frac{m_{\%C}}{100}}{M_{m_C}} = \frac{90 \cdot 0,267}{12,01} = \underline{\underline{2}}$$

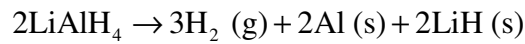
$$n_H = \frac{M_{m_{\text{okalsyre}}} \cdot \frac{m_{\%H}}{100}}{M_{m_H}} = \frac{90 \cdot 0,022}{1,01} = \underline{\underline{2}}$$

$$n_O = \frac{M_{m_{\text{okalsyre}}} \cdot \frac{m_{\%O}}{100}}{M_{m_O}} = \frac{90 \cdot 0,711}{16,00} = \underline{\underline{4}}$$

Molekylformel for oksalsyre blir $C_2H_2O_4$.

Oppgave 5

$$M_{m_M} = \frac{m_M}{n_M} = \frac{m_M}{n_O} = \frac{m_M}{\frac{m_O}{M_{m_O}}} = \frac{1,000}{0,183} = 87,426 \frac{\text{g}}{\text{mol}} \text{) : Sr, strontium}$$

Oppgave 6

$$V = \frac{n_H RT}{P_H} = \frac{3n_{2\text{LiAlH}_4} RT}{P_H} = \frac{3 \cdot \frac{m_{2\text{LiAlH}_4}}{M_{m_{2\text{LiAlH}_4}}} RT}{P_H} = \frac{3 \cdot \frac{2 \cdot 0,200}{2(6,94 + 26,98 + 4 \cdot 1,01)} \cdot 0,08206 \cdot 60}{\frac{745}{760}} = \underline{\underline{0,079 \text{ L}}}$$

Oppgave 7