

# RAČUNANJE V KEMIJI

## Mešane računске naloge

1. Izračunaj, koliko tehta 0,25 mol ogljikovega dioksida.

Izračunamo s pomočjo PSE,

Podatki:

$$\begin{aligned} n(\text{CO}_2) &= 0,25 \text{ mol} \\ m(\text{CO}_2) &= ? \end{aligned}$$

Račun:

$$\begin{aligned} n &= \frac{m}{M} \quad \leftarrow \text{PSE} \\ m &= n \cdot M \\ m &= 0,25 \text{ mol} \cdot 441,0 \frac{\text{g}}{\text{mol}} = \underline{\underline{110,3 \text{ g}}} \end{aligned}$$

$$\begin{aligned} M(\text{CO}_2) &= (12,0 + 2 \cdot 16,0) \frac{\text{g}}{\text{mol}} \\ M(\text{CO}_2) &= 441,0 \frac{\text{g}}{\text{mol}} \end{aligned}$$

2. Določi množino snovi v 68 g amonijaka.

Podatki:

$$\begin{aligned} m(\text{NH}_3) &= 68 \text{ g} \\ n(\text{NH}_3) &= ? \end{aligned}$$

Račun:

$$n = \frac{m}{M} = \frac{68 \text{ g}}{17,03 \text{ g/mol}} = \underline{\underline{3,99 \text{ mol}}}$$

$$M(\text{NH}_3) = (14,0 + 3 \cdot 1,01) \frac{\text{g}}{\text{mol}} = 17,03 \frac{\text{g}}{\text{mol}}$$

3. Izračunaj, koliko molekul ogljikove kisline je v 124 g.

Podatki:

$$\begin{aligned} m(\text{H}_2\text{CO}_3) &= 124 \text{ g} \\ N(\text{H}_2\text{CO}_3) &= ? \text{ [molekul]} \\ n &= \frac{m}{M} \end{aligned}$$

Račun:

$$N = n \cdot N_A = \frac{m}{M} \cdot N_A$$

$$\begin{aligned} M(\text{H}_2\text{CO}_3) &= (2 \cdot 1,01 + 12,0 + 3 \cdot 16,0) \frac{\text{g}}{\text{mol}} = 62,02 \frac{\text{g}}{\text{mol}} \\ N &= \frac{124 \text{ g}}{62,02 \text{ g/mol}} \cdot 6,022 \cdot 10^{23} \frac{\text{molekul}}{\text{mol}} = \underline{\underline{1,204 \cdot 10^{24} \text{ molekul}}} \end{aligned}$$

Poznamo na pamet - Avogadrova konstanta

4. Koliko tehta:

a)  $2 \cdot 10^{23}$  molekul kisika?

Podatki:

$$\begin{aligned} N &= 2 \cdot 10^{23} \text{ molekul} \\ m &= ? \end{aligned}$$

$$M(\text{O}_2) = 32,0 \frac{\text{g}}{\text{mol}}$$

Račun:

$$\begin{aligned} N &= n \cdot N_A \rightarrow n = \frac{N}{N_A} = \frac{2 \cdot 10^{23} \text{ molekul}}{6,022 \cdot 10^{23} \text{ molekul}} \\ n &= 0,332 \text{ mol} \\ n &= \frac{m}{M} \rightarrow m = n \cdot M = 0,332 \text{ mol} \cdot 32,0 \frac{\text{g}}{\text{mol}} \\ m &= \underline{\underline{10,63 \text{ g}}} \end{aligned}$$

b)  $10^{24}$  atomov helija?

Podatki:

$$\begin{aligned} N(\text{He}) &= 10^{24} \text{ atomov} \\ m &= ? \end{aligned}$$

$$M(\text{He}) = 4,00 \frac{\text{g}}{\text{mol}}$$

Račun:

$$\begin{aligned} N &= n \cdot N_A \rightarrow n = \frac{N}{N_A} = \frac{10^{24} \text{ atomov}}{6,022 \cdot 10^{23} \text{ atomov}} \\ n &= 1,66 \text{ mol} \\ n &= \frac{m}{M} \rightarrow m = n \cdot M = 1,66 \text{ mol} \cdot 4,00 \frac{\text{g}}{\text{mol}} \\ m &= \underline{\underline{6,642 \text{ g}}} \end{aligned}$$