

Solutions

Each answer shows the steps, then the **result**.

2.1

- mass of a component is its mass fraction times the total:

$$m = (0.15)(200 \text{ g})$$

- $m = \mathbf{30 \text{ g}}$

2.2

- A mixture has variable composition (or can be separated physically)

2.3

- $100 - 60 = 40\%$

2.4

- moles from mass:

$$n = \frac{m}{M} = \frac{24 \text{ g}}{12 \text{ g mol}^{-1}}$$

- $n = \mathbf{2.0 \text{ mol}}$

3.1 B

- its composition can vary

3.2 B

- $10/40 \times 100 = 25\%$

3.3

(a)

- mass of copper is its mass fraction times the total:

$$m(\text{Cu}) = (0.65)(250 \text{ g})$$

- $m(\text{Cu}) = \mathbf{162.5 \text{ g}}$

(b)

- the rest is zinc: $m(\text{Zn}) = (0.35)(250 \text{ g}) = \mathbf{87.5 \text{ g}}$

3.4

(a)

- moles from mass for each liquid:

$$n = \frac{m}{M} : \quad n(\text{water}) = \frac{18 \text{ g}}{18 \text{ g mol}^{-1}}, \quad n(\text{ethanol}) = \frac{46 \text{ g}}{46 \text{ g mol}^{-1}}$$

- $\mathbf{1.0 \text{ mol}}$ of each

(b)

- No – it is variable