

Concentration Ratios

Percent by Volume

$$\%(\text{v/v}) = \frac{\text{volume of solute}}{\text{volume of solution}} \times 100\%$$

Ex. 5% acetic acid

$$\Rightarrow \frac{5 \text{ mL of acid}}{100 \text{ mL of solution}}$$

Mass - Mass Ratio (% (m/m))

$$\%(\text{m/m}) = \frac{\text{mass of solute}}{\text{mass of solution}} \times 100\%$$

Ex. 6% m/m of hydrogen peroxide

$$\Rightarrow \frac{6 \text{ g of H}_2\text{O}_2}{100 \text{ g of solution}}$$

Sample Problems

What is the percent by volume of ethanol in the final solution when 85mL of ethanol is diluted to a total volume of 250 mL with water?

$$\begin{aligned} \%v/v &= \frac{V_{\text{solute}}}{V_{\text{sol'n}}} \times 100\% \\ &= \frac{85\text{mL}}{250\text{mL}} \times 100\% \\ &= \boxed{34\%} \end{aligned}$$

What mass of KNO_3 would be needed to prepare 1250 g of a 15.0% (m/m) KNO_3 solution?

15% m/m

$$m_{\text{sol'n}} = 1250\text{g}$$

$$m_{\text{solute}} = ?$$

$$\% \text{ m/m} = \frac{m_{\text{solute}}}{m_{\text{sol'n}}} \times 100\%$$

$$15.0\% = \frac{m_{\text{solute}}}{1250\text{g}} \times 100\%$$

$$0.15 = \frac{m_{\text{solute}}}{1250\text{g}}$$

$$m_{\text{solute}} = (0.15)(1250\text{g})$$

$$\boxed{m_{\text{solute}} = 188\text{g}}$$

Solutions Test

Quiz

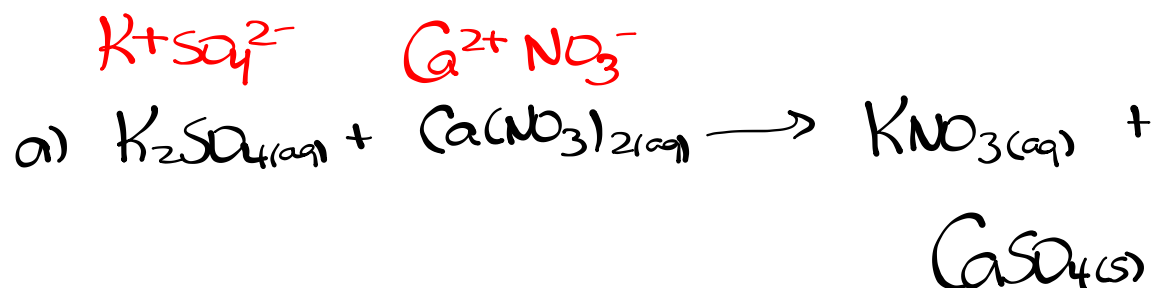
- Net Ionic Equations

- Concentration

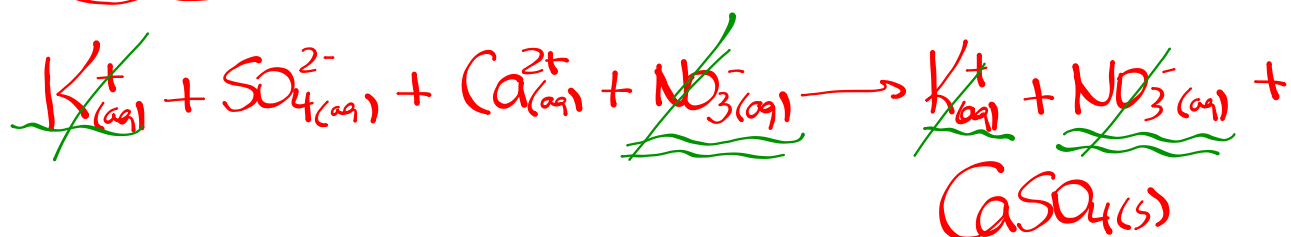
- Dilutions

$$C = \frac{n}{V} \quad / \% v/v \quad / \% m/m$$

$$v_i C_i = v_f C_f$$



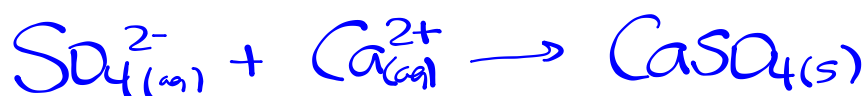
Complete Ionic:



Spectator Ion(s):



Net Ionic:



Test Review

Worksheet