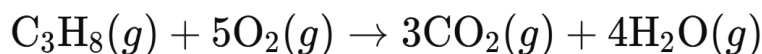


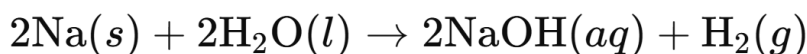
Mixed Stoichiometric Calculations Worksheet ANSWERS

1. If 44.0 g of propane (C₃H₈) undergoes complete combustion, what volume of carbon dioxide (CO₂) gas is produced at STP?



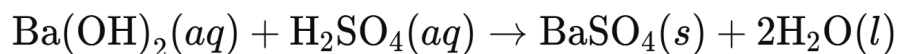
$$44.0 \text{ g C}_3\text{H}_8 \times \frac{1 \text{ mol}}{44.10 \text{ g}} \times \frac{3 \text{ mol CO}_2}{1 \text{ mol C}_3\text{H}_8} \times \frac{22.4 \text{ L}}{1 \text{ mol}} = \mathbf{67.0 \text{ L CO}_2}$$

2. What number of hydrogen (H₂) molecules is produced when 4.60 g of sodium (Na) reacts with water?



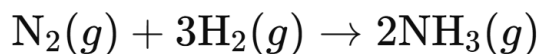
$$4.60 \text{ g Na} \times \frac{1 \text{ mol}}{22.99 \text{ g}} \times \frac{1 \text{ mol H}_2}{2 \text{ mol Na}} \times \frac{6.022 \times 10^{23} \text{ molecules}}{1 \text{ mol}} = \mathbf{6.02 \times 10^{22} \text{ molecules H}_2}$$

3. If 13.3 g of barium hydroxide [Ba(OH)₂] is dissolved and reacts completely with sulfuric acid, what is the **concentration** (mol/L) of sulfuric acid required in 250 mL of solution?



$$13.3 \text{ g Ba}(\text{OH})_2 \times \frac{1 \text{ mol}}{171.34 \text{ g}} \times \frac{1 \text{ mol H}_2\text{SO}_4}{1 \text{ mol Ba}(\text{OH})_2} \times \frac{1}{0.250 \text{ L}} = \mathbf{0.31 \text{ mol/L}}$$

4. If you start with 9.03×10^{23} molecules of nitrogen gas (N₂), what volume of ammonia gas (NH₃) will be produced at STP?



$$9.03 \times 10^{23} \text{ molecules N}_2 \times \frac{1 \text{ mol}}{6.022 \times 10^{23} \text{ molecules}} \times \frac{2 \text{ mol NH}_3}{1 \text{ mol N}_2} \times \frac{22.4 \text{ L}}{1 \text{ mol}} = \mathbf{67.2 \text{ L NH}_3}$$