

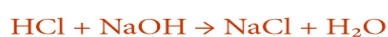
Name :

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HIGH SCHOOL CHEMISTRY STOICHIOMETRY

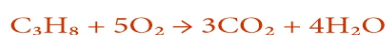
Solve the following stoichiometry problems by applying mole ratios, molar masses, and conversion factors. Double-check your calculations for accuracy.

1. How many grams of sodium chloride (NaCl) are produced when 2.00 moles of hydrochloric acid (HCl) react with excess sodium hydroxide (NaOH)?



$$2.00 \text{ mol HCl} \times (1 \text{ mol NaCl} / 1 \text{ mol HCl}) \times 58.44 \text{ g/mol} = \mathbf{116.88 \text{ g NaCl}}$$

2. What mass of carbon dioxide (CO₂) is produced when 44.0 g of propane (C₃H₈) combust completely? (Molar mass of C₃H₈ = 44 g/mol)



$$44.0 \text{ g C}_3\text{H}_8 \div 44 \text{ g/mol} = 1.00 \text{ mol C}_3\text{H}_8$$

$$1.00 \text{ mol C}_3\text{H}_8 \times (3 \text{ mol CO}_2 / 1 \text{ mol C}_3\text{H}_8) \times 44 \text{ g/mol} = \mathbf{132 \text{ g CO}_2}$$

3. How many moles of oxygen gas (O₂) are required to completely react with 4.00 moles of ammonia (NH₃)?



$$4.00 \text{ mol NH}_3 \times (3 \text{ mol O}_2 / 4 \text{ mol NH}_3) = \mathbf{3.00 \text{ mol O}_2}$$

4. What mass of aluminum oxide (Al₂O₃) is formed when 5.00 moles of aluminum react with oxygen?



$$5.00 \text{ mol Al} \times (1 \text{ mol Al}_2\text{O}_3 / 2 \text{ mol Al}) \times 101.96 \text{ g/mol} = \mathbf{254.9 \text{ g Al}_2\text{O}_3}$$

5. How many grams of water (H₂O) are produced when 0.500 moles of methane (CH₄) combust completely?



$$0.500 \text{ mol CH}_4 \times (2 \text{ mol H}_2\text{O} / 1 \text{ mol CH}_4) \times 18 \text{ g/mol} = \mathbf{18.0 \text{ g H}_2\text{O}}$$