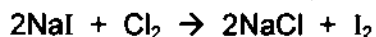


### Stoichiometry Practice Test

1. How many moles of iodine are produced when 7.00 moles of chlorine reacts with an excess of sodium iodide?



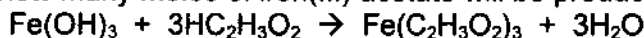
$$\frac{7.00 \text{ mol Cl}_2}{1 \text{ mol Cl}_2} \times \frac{1 \text{ mol I}_2}{1 \text{ mol Cl}_2} = 7.00 \text{ mol I}_2$$

2. How many moles of hydrogen are required to react completely with 25.0 moles of nitrogen in the formation of ammonia?



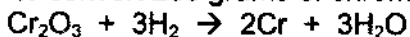
$$\frac{25.0 \text{ mol N}_2}{1 \text{ mol N}_2} \times \frac{3 \text{ mol H}_2}{1 \text{ mol N}_2} = 75.0 \text{ mol H}_2$$

3. Iron(III) hydroxide reacts with acetic acid to form iron(III) acetate and water. If 45.4 grams of water are formed, how many moles of iron(III) acetate will be produced?



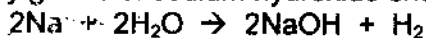
$$\frac{45.4 \text{ g H}_2\text{O}}{18.02 \text{ g H}_2\text{O}} \times \frac{1 \text{ mol H}_2\text{O}}{3 \text{ mol H}_2\text{O}} \times \frac{1 \text{ mol Fe}(\text{C}_2\text{H}_3\text{O}_2)_3}{1 \text{ mol Fe}(\text{C}_2\text{H}_3\text{O}_2)_3} = 0.840 \text{ mol Fe}(\text{C}_2\text{H}_3\text{O}_2)_3$$

4. A chemist uses hot hydrogen gas to convert chromium(III) oxide to pure chromium. How many moles of hydrogen are need to convert 250 grams of chromium(III) oxide?



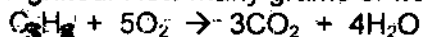
$$\frac{250 \text{ g Cr}_2\text{O}_3}{152.00 \text{ g Cr}_2\text{O}_3} \times \frac{1 \text{ mol Cr}_2\text{O}_3}{1 \text{ mol Cr}_2\text{O}_3} \times \frac{3 \text{ mol H}_2}{1 \text{ mol Cr}_2\text{O}_3} = 4.93 \text{ mol H}_2$$

5. Ideal stoichiometric quantities of sodium and water are mixed, and 0.945 moles of hydrogen gas is recovered. How many grams of sodium hydroxide should be recovered?



$$\frac{0.945 \text{ mol H}_2}{1 \text{ mol H}_2} \times \frac{2 \text{ mol NaOH}}{1 \text{ mol H}_2} \times \frac{40.00 \text{ g NaOH}}{1 \text{ mol NaOH}} = 75.6 \text{ g NaOH}$$

6. Propane reacts with oxygen to form carbon dioxide and water. 11.0 moles of propane are mixed with oxygen and then ignited. How many grams of water vapor are produced?



$$\frac{11.0 \text{ mol C}_3\text{H}_8}{1 \text{ mol C}_3\text{H}_8} \times \frac{4 \text{ mol H}_2\text{O}}{1 \text{ mol C}_3\text{H}_8} \times \frac{18.02 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 793 \text{ g H}_2\text{O}$$

7. Hydrogen can react explosively with oxygen to form water. If 125 grams of  $O_2$  is combined with an excess of  $H_2$ , how many grams of water will be produced?



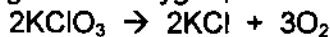
$$\frac{125g O_2}{32.00g O_2} \times \frac{1 mol O_2}{1 mol O_2} \times \frac{2 mol H_2O}{1 mol O_2} \times \frac{18.02g H_2O}{1 mol H_2O} = 141 g H_2O$$

8. A 17.8 gram mass of magnesium is added to a solution of hydrochloric acid, HCl. What mass of magnesium chloride is formed?



$$\frac{17.8 g Mg}{24.31 g Mg} \times \frac{1 mol Mg}{1 mol Mg} \times \frac{1 mol MgCl_2}{1 mol Mg} \times \frac{95.21 g MgCl_2}{1 mol MgCl_2} = 69.7 g MgCl_2$$

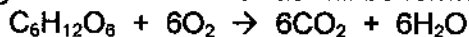
9. When 35.9 grams of potassium chlorate is heated, it decomposes into potassium chloride and oxygen gas. If you collect 11.0 grams of oxygen, what is your percent yield?



$$\frac{35.9 g KClO_3}{122.55 g KClO_3} \times \frac{1 mol KClO_3}{1 mol KClO_3} \times \frac{3 mol O_2}{2 mol KClO_3} \times \frac{32.00 g O_2}{1 mol O_2} = 14.1 g O_2$$

$$\frac{11.0 g}{14.1 g} \times 100 = 78\% \text{ yield}$$

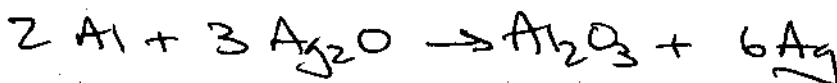
10. If 87.2 grams of glucose ( $C_6H_{12}O_6$ ) are burned in 87.2 grams of oxygen, what is the limiting reactant, and how many grams of carbon dioxide will be formed?



$$\frac{87.2 g C_6H_{12}O_6}{180.18 g C_6H_{12}O_6} \times \frac{1 mol C_6H_{12}O_6}{1 mol C_6H_{12}O_6} \times \frac{6 mol CO_2}{1 mol C_6H_{12}O_6} \times \frac{44.01 g CO_2}{1 mol CO_2} = 128 g CO_2$$

$$\frac{87.2 g O_2}{32.00 g O_2} \times \frac{1 mol O_2}{1 mol O_2} \times \frac{6 mol CO_2}{6 mol O_2} \times \frac{44.01 g CO_2}{1 mol CO_2} = 120 g CO_2$$

11. When 45.5 mol of aluminum react with an excess of silver oxide in solution, how many grams of pure silver are formed?



$$\frac{45.5 mol Al}{2 mol Al} \times \frac{6 mol Ag}{1 mol Al} \times \frac{107.87 g Ag}{1 mol Ag} = 14724 g Ag$$