

12.2 USING MOLES MASS- MASS *Supplemental Practice Problems*

MASS-MASS EQUATIONS

Solve the following problems. The reactions may not be balanced.

1. If 28.0 g of magnesium react with excess hydrochloric acid, how many grams of hydrogen gas are produced? $\text{Mg(s)} + 2\text{HCl(aq)} \rightarrow \text{MgCl}_2\text{(aq)} + \text{H}_2\text{(g)}$

$$\frac{28.0 \text{ g Mg}}{1} \times \frac{1 \text{ mol Mg}}{24.3 \text{ g Mg}} \times \frac{1 \text{ mol H}_2}{1 \text{ mol Mg}} \times \frac{2 \text{ g H}_2}{1 \text{ mol H}_2} = ? \text{ (g) H}_2$$

2. How many grams of sodium iodide must be reacted with excess chlorine gas if 15.0 g of sodium chloride are needed?

$$\frac{15 \text{ g NaCl}}{1} \times \frac{1 \text{ mol NaCl}}{58.5 \text{ (g) NaCl}} \times \frac{2 \text{ mol NaI}}{2 \text{ mol NaCl}} \times \frac{150 \text{ g NaI}}{1 \text{ mol NaI}} = ? \text{ g NaI}$$

3. How many grams of potassium chloride are produced in the decomposition of 11.00 g of potassium chlorate? $2\text{KClO}_3\text{(s)} \rightarrow 2\text{KCl(s)} + 3\text{O}_2\text{(g)}$

$$\frac{11 \text{ g KClO}_3}{1} \times \frac{1 \text{ mol KClO}_3}{122.4 \text{ g KClO}_3} \times \frac{2 \text{ mol KCl}}{2 \text{ mol KClO}_3} \times \frac{74.4 \text{ g KCl}}{1 \text{ mol KCl}} = ? \text{ g KCl}$$

4. What mass of silver is produced from 33.0 g of silver nitrate dissolved in water? $\text{Cu(s)} + 2\text{AgNO}_3\text{(aq)} \rightarrow \text{Cu(NO}_3)_2\text{(aq)} + 2\text{Ag(s)}$

$$\frac{33.0 \text{ g AgNO}_3}{1} \times \frac{1 \text{ mol AgNO}_3}{170 \text{ g AgNO}_3} \times \frac{2 \text{ mol Ag}}{2 \text{ mol AgNO}_3} \times \frac{108 \text{ g Ag}}{1 \text{ mol Ag}} = ? \text{ g Ag}$$

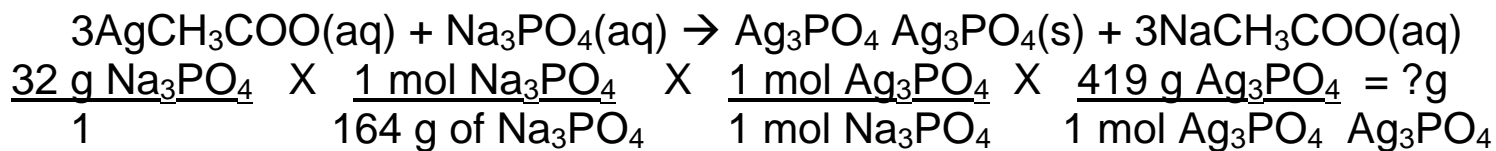
5. If excess calcium hydroxide reacts with 40.0 g of ammonium sulfate, how many grams of calcium sulfate are produced?

$$\frac{40 \text{ g (NH}_4)_2\text{SO}_4}{1} \times \frac{1 \text{ mol (NH}_4)_2\text{SO}_4}{132 \text{ g (NH}_4)_2\text{SO}_4} \times \frac{1 \text{ mol CaSO}_4}{1 \text{ mol (NH}_4)_2\text{SO}_4} \times \frac{136 \text{ g CaSO}_4}{1 \text{ mol CaSO}_4} = ? \text{ g CaSO}_4$$

6. If excess sulfuric acid reacts with 17.0 g of sodium chloride, how many grams of sodium sulfate are produced?

$$\frac{17.0 \text{ g NaCl}}{1} \times \frac{1 \text{ mol NaCl}}{58.5 \text{ g NaCl}} \times \frac{1 \text{ mol Na}_2\text{SO}_4}{2 \text{ mol NaCl}} \times \frac{142 \text{ g Na}_2\text{SO}_4}{1 \text{ mol Na}_2\text{SO}_4} = ? \text{ g Na}_2\text{SO}_4$$

7. How much silver phosphate is produced if 32.0 g of sodium phosphate react with excess silver acetate?



8. How many grams of sulfuric acid are needed to completely neutralize 55.0 g of sodium hydroxide?

