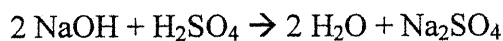


Stoichiometry Practice Worksheet III

Solve the following stoichiometry grams-grams problems:

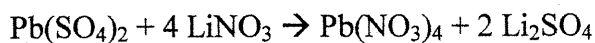
- 1) Using the following equation:



How many grams of sodium sulfate will be formed if you start with 200.00 grams of sodium hydroxide and you have an excess of sulfuric acid?

$$\begin{array}{l} 200.00 \text{ g NaOH} \left| \frac{1 \text{ mol NaOH}}{40.00 \text{ g NaOH}} \right| \frac{1 \text{ mol Na}_2\text{SO}_4}{2 \text{ mol NaOH}} \left| \frac{142.1 \text{ g}}{1 \text{ mol}} \right. \\ = \boxed{355.3 \text{ g Na}_2\text{SO}_4} \end{array}$$

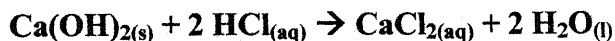
- 2) Using the following equation:



How many grams of lithium nitrate will be needed to make 250.00 grams of lithium sulfate, assuming that you have an adequate amount of lead (IV) sulfate to do the reaction?

$$\begin{array}{l} 250.00 \text{ g Li}_2\text{SO}_4 \left| \frac{1 \text{ mol Li}_2\text{SO}_4}{109.95 \text{ g Li}_2\text{SO}_4} \right| \frac{4 \text{ mol LiNO}_3}{2 \text{ mol Li}_2\text{SO}_4} \left| \frac{68.95 \text{ g}}{1 \text{ mol}} \right. \\ = \boxed{313.6 \text{ g LiNO}_3} \end{array}$$

For the questions on this worksheet, consider the following equation:



- 1) What type of chemical reaction is taking place? neutralization (acid-base)
- 2) How many liters of 0.100 M HCl would be required to react completely with 5.00 grams of calcium hydroxide?

$$\frac{5.00 \text{ g Ca(OH)}_2}{74.10 \text{ g Ca(OH)}_2} \times \frac{1 \text{ mol}}{1 \text{ mol}} = 0.0675 \text{ mol Ca(OH)}_2$$

$$\frac{0.0675 \text{ mol Ca(OH)}_2}{1 \text{ mol Ca(OH)}_2} \times \frac{2 \text{ mol HCl}}{1 \text{ mol Ca(OH)}_2} \times \frac{1 \text{ L}}{0.100 \text{ mol HCl}} = \boxed{1.35 \text{ L}}$$

- 3) If I combined 15.0 grams of calcium hydroxide with 75.0 mL of 0.500 M HCl, how many grams of calcium chloride would be formed?

$$\frac{15.0 \text{ g Ca(OH)}_2}{74.10 \text{ g Ca(OH)}_2} \times \frac{1 \text{ mol}}{1 \text{ mol}} = 0.202 \text{ mol Ca(OH)}_2$$

$$\frac{0.075 \text{ L HCl}}{1 \text{ L}} \times \frac{0.500 \text{ mol}}{1 \text{ L}} = 0.0375 \text{ mol HCl}$$

* Based on rxn. above HCl is limiting

$$\frac{0.0375 \text{ mol HCl}}{2 \text{ mol HCl}} \times \frac{1 \text{ mol CaCl}_2}{1 \text{ mol Ca(OH)}_2} \times \frac{110.98 \text{ g CaCl}_2}{1 \text{ mol}} = \boxed{2.08 \text{ g CaCl}_2}$$

- 4) What is the limiting reagent from the reaction in problem #3? HCl

- 5) How many grams of the excess reagent will be left over after the reaction in problem 3 is complete?

$$\frac{0.0375 \text{ mol HCl}}{2 \text{ mol HCl}} \times \frac{1 \text{ mol Ca(OH)}_2}{1 \text{ mol Ca(OH)}_2} \times \frac{74.10 \text{ g Ca(OH)}_2}{1 \text{ mol}} = 1.39 \text{ g}$$

$$15.0 - 1.39 = \boxed{13.6 \text{ g Ca(OH)}_2}$$