Unit 8 Review: Stoichiometry

Conceptual Review:
As you review for the Unit 8 test, make sure to review/complete your objectives and homework packet.

1. Arsenic reacts with oxygen gas to produce diarsenic trioxide.
    $$4\ As + 3\ O_2 \longrightarrow 2\ As_2O_3$$

    a. Sketch 10 **atoms** of arsenic and 6 **molecules** of oxygen gas in a container on the left. In the right container, sketch the contents *after* the reaction is complete.
    b. How many molecules of diarsenic trioxide can be produced?
    c. Which reactant is in excess?
    d. How many atoms or molecules of excess reactant are there?

Stoichiometry Problems *Show all work* – BCA table, calcs, units, substances – and **BOX ANSWERS**

2. Iron is placed in an aqueous solution of hydrochloric acid (HCl). What mass of iron (II) chloride is produced if 225 g of iron reacts completely? The other product is hydrogen gas.

3. Calcium sulfate decomposes, forming calcium sulfide and oxygen gas. If 532 g of calcium sulfide is produced, what mass of calcium sulfate reacted?

4. For the following reaction; if 10.0 g of each reactant is given, what is the limiting reactant? Calculate the mass of each product that is expected. What mass of excess reactant will remain after the limiting reactant is consumed?
    $$C_3H_8\ (g)\ +\ O_2\ (g)\ \rightarrow\ CO_2\ (g)\ +\ H_2O\ (g)$$

5. A student placed a piece of magnesium in silver nitrate solution. Silver metal precipitated and aqueous magnesium nitrate was also produced. The student collected the following data:

Mass of empty beaker	104.55 g
Mass of beaker with silver	107.50 g
Mass of magnesium before	4.00 g
Mass of magnesium after	3.65 g

    a. Write a balanced equation for the reaction.
    b. From the mass of Mg reacted, determine the theoretical yield of silver (Hint: use a BCA table)
    c. Determine the actual yield of silver.
    d. Determine the percent yield of silver.