GAS STOICHIOMETRY WORKSHEET

Please answer the following on <u>separate paper</u> using proper units and showing all work. Please note that these problems require a **balanced chemical equation**.

1. Carbon monoxide reacts with oxygen to produce carbon dioxide. If 1.0 L of carbon monoxide reacts with oxygen at STP,
    a. how many liters of oxygen are required to react?
    b. How many liters of carbon dioxide are produced?

2. Acetylene gas (C_2H_2) undergoes combustion to produce carbon dioxide and water vapor.
    a. How many liters of C_2H_2 are required to produce 75.0 L of CO_2?
    b. What volume of H_2O is produced?
    c. What volume of O_2 is required?

3. If liquid carbon disulfide (CS_2) reacts with 450 mL of oxygen to produce the gases carbon dioxide and sulfur dioxide, what volume of each product is produced?

4. Assume that 5.60 L of hydrogen gas at STP reacts with copper (II) oxide according to the following balanced equation:

    $$CuO \text{ (s)} + H_2 \text{ (g)} \rightarrow Cu \text{ (s)} + H_2O \text{ (g)}$$

    a. How many moles of H_2 react?
    b. How many moles of copper are produced?
    c. How many grams of copper are produced?

5. Assume that 8.5 L of iodine gas (I_2) are produced at STP according to the following balanced equation:

    $$2 \text{ KI (aq)} + Cl_2 \text{ (g)} \rightarrow 2 \text{ KCl (aq)} + I_2 \text{ (g)}$$

    a. How many moles of I_2 are produced?
    b. How many moles of KI were used?
    c. How many grams of KI were used?

6. Solid iron (III) hydroxide decomposes to produce iron (III) oxide and water vapor. If 0.75 L of water vapor are produced at STP,
    a. How many grams of iron (III) hydroxide were used?
    b. How many grams of iron (III) oxide were produced?

7. Solid iron reacts with sulfuric acid (H_2SO_4) to produce iron (II) sulfate and hydrogen gas. If 650 mL of hydrogen gas are collected at STP, how many grams of iron (II) sulfate are also produced?