

Limiting Reactants & Percent Yield Practice Problems

1. The reaction between solid sodium and iron(III) oxide is one in a series of reactions that inflates an automobile airbag: $6\text{Na}(s) + \text{Fe}_2\text{O}_3(s) \rightarrow 3\text{Na}_2\text{O}(s) + 2\text{Fe}(s)$. If 100.0 g of Na and 100.0 g of Fe_2O_3 are used in the reaction, determine the following:

A. Limiting Reactant : _____

B. Reactant in Excess : _____

C. Mass of Solid Iron Produced (*use limiting reactant moles*)

D. Mass of Excess Reactant (*after the reaction is complete*)

2. Photosynthesis reactions in green plants use carbon dioxide and water to produce glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) and oxygen. A plant has 88.0 g of carbon dioxide and 64.0 g of water available for photosynthesis.

A. Write the balanced chemical equation for the reaction.

B. Determine the Limiting Reactant : _____

C. Determine the Excess Reactant : _____

D. Determine the Mass of Glucose Produced (*use limiting reactant moles*)

E. Determine the Mass in Excess (*after the reaction is complete*)

3. In an experiment, you combine 83.77 g of iron with an excess of sulfur and then heat the mixture to obtain iron (III) sulfide.

A. Write out the balanced equation.

B. What is the theoretical yield, in grams, of iron (III) sulfide.

C. If 152.3 g of iron (III) sulfide is obtained, what is the percent yield?

4. In a reaction, 1.912 moles of zinc react with iodine to produce zinc iodide.

A. Write out the balanced equation.

B. How many grams of zinc iodide are produced in the reaction?

C. If 515.6 g of zinc iodide is actually produced, what is the percent yield?

5. In a reaction, 20.0 g of copper react with silver nitrate.

A. Write out the balanced equation.

B. How many grams of silver are produced in the reaction?

C. If 60.0 g of silver is actually produced, what is the percent yield?