

Stoichiometry
Review II

Show all work on a separate sheet of paper using the factor-label method when possible. Any problems without supporting work will receive reduced credit. Round all answers using sig figs.

Part 1: Fill in the blank.

1. The study of the amounts of substances produced and consumed in a chemical reaction is called _____.
2. The amount of product predicted to be formed during a chemical reaction by doing a mathematical calculation is the _____ yield.
3. The percent yield of a chemical reaction is calculated by dividing the _____ yield by the theoretical yield.
4. The coefficients of a balanced chemical equation may be used to express the mole _____ of reactant and/or products.
5. A substance that is not present in sufficient quantities to react with all of another substance in a chemical reaction is called the _____ reactant.

Part 2: Problems-each question may have multiple parts. READ carefully and answer all questions completely.

6. Hydrogen gas and aqueous sodium hydroxide are produced when solid sodium metal reacts completely with water. How many moles of hydrogen gas are produced when 39.64 grams of sodium reacts with excess water.
7. Solid sodium chlorate decomposes to form solid sodium chloride and oxygen gas when heated strongly. How many grams of sodium chloride can be produced when 238 grams of sodium chlorate decompose?
8. Tin (II) fluoride is used in some toothpastes. It is made by a reaction of tin metal with hydrogen fluoride gas (HF). The other product in the reaction is hydrogen gas.
 - a. Write a balanced equation for the reaction.
 - b. Identify the limiting reactant if 150.0 g of Sn and 37.00 g of HF are used in the reaction.
 - c. Calculate the mass in gram of tin (II) fluoride that could be produced by the reaction.
 - d. How many grams of the excess reactant would be left over

9. Chemist Sue performed a reaction of zinc sulfate with sodium hydroxide to produce zinc hydroxide and sodium sulfate. She started with 250.0 g of zinc sulfate and an unlimited amount of sodium hydroxide. She obtained 120.66 g of zinc hydroxide precipitate. Find the theoretical yield and the percent yield for her experiment.

10. If 18.51 moles of H_2 gas and 19.25 moles of O_2 are available to react to produce water, which reactant is the limiting reactant? How many grams of water could be produced?