

Solution Stoichiometry

Answer the following questions on a separate sheet of paper.

1. A solution of magnesium chloride is reacted with a solution of sodium fluoride to produce magnesium fluoride and sodium chloride.
 - a. Write a balanced chemical equation for this reaction.
 - b. If 0.150 L of 0.400 M magnesium chloride is reacted with 0.200 L of sodium fluoride, what concentration of sodium fluoride is required? What would be the mass of each of the products?
 - c. If 100 mL of 0.500 M sodium fluoride is reacted with a 0.200 M magnesium chloride, what volume of magnesium chloride is required? What would be the mass of each of the products?
2. Sodium carbonate solution is reacted with iron (III) chloride solution to produce sodium chloride and iron (III) carbonate.
 - a. Write a balanced chemical equation.
 - b. If 0.200 L of 0.600 M sodium carbonate is reacted with 0.250 L of iron (III) chloride, what concentration of iron (III) chloride is required? What would be the mass of each of the products?
 - c. If the reaction actually yields 12.6 g of sodium chloride, what is the percent yield of the reaction? What mass of iron (III) carbonate would actually be produced?
 - d. If 400 mL of 0.250 M iron (III) chloride is reacted with 0.300 M sodium carbonate, what volume of sodium carbonate is required? What would be the mass of each of the products? IF the reaction has an 80.0 % yield, what mass would actually be obtained for each of the products?
3. Mercury (II) nitrate is reacted with sodium iodide.
 - a. Write a balanced chemical equation.
 - b. If 75.0 mL of 0.100 M mercury (II) nitrate solution is reacted with 80.0 mL of 0.150 M sodium iodide solution, which reactant is limiting and which is excess? What is the mass of each of the products?
 - c. If 40.0 mL of 0.200 M mercury (II) nitrate solution is reacted with 50.0 mL of 0.400 M sodium iodide solution, which reactant is limiting and which is excess? What is the mass of each of the products?
4. Silver nitrate is reacted with aluminum chloride.
 - a. Write a balanced chemical equation.
 - b. If 200 mL of 0.450 M silver nitrate solution is reacted with 125 mL M aluminum chloride solution, which reactant is limiting and which is in excess? What is the mass of each of the products? If the percent yield for the reaction is 70.0 %, what mass would actually be obtained for each of the products? Write the formula equation, complete ionic equation, and net ionic equation for the reaction. What are the spectator ions for this reaction?