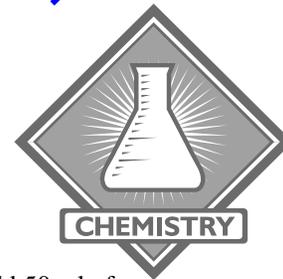


Name(s): _____

20 Pts.

Chemistry Lab: Limiting Reactant Stoichiometry



I. Purpose:

To determine the limiting reactant and theoretical mass of one of the products of a double displacement reaction with the experimentally determined mass of the same product.

II. Procedure:

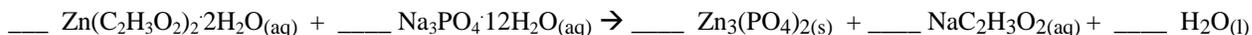
1. Using the balance measure out 1.00g $\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 2\text{H}_2\text{O}$ into a 150 ml beaker. Add 50 ml of water to the salt mixture. Stir the salt until all of the salts disappears.
2. Measure out approximately 3 g $\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$ into a 150 ml beaker. Add 50 ml of water to the salt mixture. Stir the salt until all of the salts disappears.
3. Find the mass of a piece of filter paper. Record the mass and set up a gravity filtration apparatus with a beaker under the funnel to filter and separate your precipitate from filtrate.
4. Filter the mixture. Pour slowly and never allow the mixture to rise above the edge of the filter paper.
5. Rinse the beaker with 20 ml of water. Pour the rinse through the filter. Repeat the rinsings until all of the excess soluble salts are washed out.
6. Remove the filter paper with precipitate from the funnel and place in a 45 °C drying oven.
7. Measure the mass of the dry precipitate and find the mass of the dry precipitate.

III. Analysis:

Data and Observations:

- a.) Mass of $\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 2\text{H}_2\text{O}$: _____
- b.) Mass of $\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$: _____
- c.) Mass of filter paper: _____
- d.) Mass of dry precipitate with filter paper: _____
- e.) Mass of dry precipitate: _____

Balance the equation for the reaction of $\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 2\text{H}_2\text{O}$ with $\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$



IV. Conclusion Questions:

1. What is the molar mass of $\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 2\text{H}_2\text{O}$?
2. What is the molar mass of $\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$?
3. What is the molar mass of $\text{Zn}_3(\text{PO}_4)_2$?
4. Which reactant is limiting? Show work.

