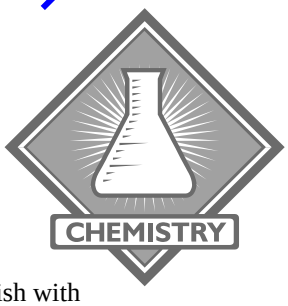
Name(s): _____ **20 Pts.**

Chemistry Lab: Determination of Tin Oxide Empirical Formula



I. Purpose:

To react a carefully determined mass of tin with an excess of nitric acid
Form a tin-oxygen crystalline product and calculate the mole ratio to predict the empirical formula

II. Procedure:

1. Clean and dry an evaporating dish and a watch cover. Determine the mass of the dish with watch cover to nearest 0.01 g. Use forceps to handle dish and cover throughout experiment.
2. Place about 2-grams of granulated tin in the evaporating dish, cover with watch glass and mass.
3. Add 5 ml of 8*M* nitric acid, HNO_3, and replace the watch glass. ***Caution: nitric acid causes burns. This reaction releases a large amount of heat (TOO HOT TO TOUCH!) and releases a poisonous gas. Reaction must take place under a fume hood.***
4. After reaction has nearly stopped, begin heating the dish over a boiling water bath.
5. When popping and splattering no longer occur remove the evaporating dish from the water bath. Remove the watch glass taking care not to remove, lose, or wash away any lose substance on the glass until all measurements have been made. Break up the solid with a stirring rod.
6. Position the dish on a wire gauze and heat carefully until the solid becomes pale yellow (dry). Turn off heat, cool, and mass with watch glass. Reheat to assure that contents are dry.

III. Analysis:

Data Table and Calculations: (*Show calculation in box)

Mass of evaporating dish and cover	
Mass of dish, cover, and tin	
Mass of tin	
Moles of tin	
Mass of dish, cover, and tin-oxide	
Mass of oxygen	
Moles of oxygen	

IV. Conclusion Questions:

1. From the two oxidation charges of tin, write and name the two possible tin oxide products.

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2. Using your results of tin and oxygen moles, find the mole ratio and predict the empirical formula.

3. Calculate the percentage of Sn and O in your product.

4. According to your data, what mass of tin would be found in 250.0 kg of your tin oxide product?

5. According to your data, how many atoms of Sn and O were reacted? How does the ratio of atoms compare to ratio of moles?

6. Use the results found in Conclusion #2 to calculate the mass of one formula unit of your compound.

7. In this experiment you determined the empirical formula of an oxide of tin, why do we not consider the molecular formula of tin oxide?