Chemistry 50 **Experiment 11**

Lab Instructor:_____ Name:_____

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DATA

1. Mass of heated and cooled crucible and cover	
2. Mass of crucible, cover, and magnesium	
3. Mass of magnesium used	
4. Mass of crucible, cover, and magnesium oxide	
5. Mass of magnesium oxide	

CALCULATIONS (Show all calculation setups, including units)

Show work here	Result
6. Mass of oxygen in your sample of magnesium oxide	
7. Moles of magnesium (calculated from the mass of magnesium used)	
8. Moles of oxygen (calculated from the mass of oxygen)	
9. Mole ratio of magnesium to oxygen	
10. Empirical formula of magnesium oxide	

Questions

1. In this experiment you determined the mass of oxygen (that combined with a weighed mass of magnesium) by subtraction: mass of product minus mass of original magnesium = mass of oxygen that combined.

As a result of this procedure, anything that was in the crucible at the end of the experiment, along with the MgO product, would cause an error in the figure that is recorded as "mass of oxygen". Would extra mass in the crucible cause the "mass of oxygen" to come out too high or too low? Explain.

2. The correct formula for magnesium oxide is MgO, a 1.0 to 1.0 ratio. But sometimes in this experiment the ratio of Mg to O comes out too low. (Example: 0.9 to 1.0) In that case, it means that there was too much oxygen relative to the mass of magnesium. At other times it comes out that the ratio is too large. An example would be: 1.2 to 1.0 (Mg to O). In such a case it must be that there has been too little oxygen (or too little weight at the end of the experiment, which registers as too little oxygen.)

In each case below, decide whether the situation described would lead to a calculated ratio of too much oxygen, or too little oxygen, and explain your reasoning. (The calculated ratio contains the mistake.)

a. Putting in more water than is needed for reaction 3, and then not drying out this excess water.

b. Forgetting to weigh the cover along with the crucible and contents at the end.

c. Letting a lot of the dense white smoke escape from the crucible during the burning.

3. Here are some data from a similar experiment, to determine the empirical formula of an oxide of tin. Calculate the empirical formula according to these data.

mass of crucible, cover, and tin sample	21.76 g
mass of empty crucible with cover	19.66 g
mass of crucible and cover and sample, after prolonged heating gives constant weight	22.29 g