Name ______________________________
Period ___ Date ___/___/___

4 • Chemical Equations and Stoichiometry

DECOMPOSITION OF MERCURIC OXIDE

Introduction: In this lecture experiment, the decomposition of mercuric oxide will be used to show an example of **Stoichiometry.** There are many ideas and concepts that show up in this lecture experiment that are part of the summer chapters.

Key Concepts:

• Stoichiometry	• Physical properties	• Chemical properties
• Types of reactions	• Decomposition	• Balancing equations
• Chemical names	• Chemical formulas	• Ionic compounds
• Mole calculations	• Conservation of mass	• Chemical changes
• Endothermic	• Exothermic	• Percentage yield

The word *STOICHIOMETRY* comes from two Greek words, ***stoichion***, which means element, and ***metron***, which means to measure. So stoichiometry is measuring elements. This means that in a chemical reaction, the masses of the reactants used can be measured and if the balanced chemical equation is known, the masses of the products formed can be predicted. This obeys the **Law of Conservation of Mass**, which states that the masses of the products formed should equal the masses of the reactants used.

Observations: What are some physical properties that we can state regarding mercuric oxide?

____________________________ ____________________________

____________________________ ____________________________

DECOMPOSITION: A type of chemical reaction in which the a reactant decomposes (breaks apart) into two or more smaller products.

Write the chemical equation for the **decomposition** of mercuric oxide.

Balance the chemical equation above. Heat is part of this chemical change. Where do you think the heat term will go? Is it a reactant or as a product? **Endothermic reactions** have energy terms as reactants and **exothermic reactions** have energy terms as products.

Next, we will collect some data so that we can predict the mass of product that will form when mercuric oxide is decomposed. We will then be able to compare this predicted value to the actual value that we measure using the electronic balance.

DATA TABLE

Mass of Test tube + mercuric oxide + balloon	____________________	± 0.01 grams
Mass of Test tube + balloon	____________________	± 0.01 grams
Mass of Test tube + mercury + balloon	____________________	± 0.01 grams

CALCULATION TABLE

Measured Mass of mercuric oxide salt	____________________	± ____ grams
Measured Mass of mercury only	____________________	± ____ grams
Calculated Mass of mercury only (from below)	____________________	± ____ grams

QUESTIONS AND CALCULATIONS:

1. What is the ***molar mass of mercuric oxide?*** ___________________________

2. Using a line equation, calculate the amount of mercury that should theoretically form from the reaction. This is called the **Theoretical Yield**.

   Given: ______________

   Desired: ______________

3. The **measured** mass of mercury would be called the **Actual Yield**.

   Determine the **Percentage Yield** for this reaction: % Yield =

4. How close was the mass of the reactants (before heating) to the mass of the products, after heating? _________ What is the percent error? ___________

   What might have caused any discrepancy?
   ____
   ____
   ____