

Calculations and Questions for the Combustion of Magnesium

1. Write a word equation for the combustion of magnesium in air (i.e. combustion in oxygen)
2. Write a balanced chemical equation for the combustion of magnesium. The formula of magnesium oxide is MgO.
3. Calculate the mass of magnesium that you used in your experiment (use three line standard form**).
4. Calculate the mass of magnesium oxide product that formed (use three line standard form**).
5. Calculate the mass of oxygen that add to the magnesium during your experiment (use three line standard form**).
6. Determine the percent composition by mass of magnesium oxide using your answers from 3, 4 and 5. This is two separate calculations, one for the %Mg and one for %O (use three line standard form**).

** Please note that the all five calculations must be done using three lines per calculation: first a blank equation, second shows substitution, third is the answer. Include units. Use the format explained in class.

7. Compare your percent composition answers with those of your classmates. If we repeated this experiment a number of times, gradually perfecting our technique, what would you expect to see?
8. Write a definition for the law of constant composition. Does the class results support this law?
9. Write a definition for the law of conservation of mass. At first appearance, why does this experiment seem to contradict this law? What is actually happening?
10. What was the reason that water was added after combustion? Write the sequence of reactions that are involved in the addition and water and subsequent heating. Hint: A side reaction with nitrogen occurs.
11. Identify two different sources of experimental error that are inherent in this experiment (make sure they are not similar). And, in a step-wise manner explain what this effect would have on your final percent composition values (i.e. would %Mg go up or down, would %O go up or down?) Explain!