Lab 1: determination of the empirical silver oxide formula essay

Andy Chen and Alexander Van Buren 9/15/11 AP Chemistry Dr. Isotone

Lab Objective: In this experiment, the percent composition and empirical formula of silver oxide will be determined. Silver oxide will be heated until it decomposes to silver metal and oxygen, and the percent calculation and empirical formula can be calculated based on combining the ratios of silver and oxygen in the reaction.

Summary of Lab Procedure:

- 1. Set up Bunsen burner on a ring stand beneath and clay triangle.
- 2. Adjust height of the clamp so it is 1 cm above the burner
- 3. Light Bunsen burner and heat the crucible for 1 min, then cool.
- 4. Weigh the crucible and lid.
- 5. Measure approximately of silver oxide and weigh.
- 6. Place crucible in triangle, heat for 2-3 minutes.
- 7. Heat for an additional 10 minutes.
- 8. Maximize flame and heat for an additional 10 minutes.
- 9. Turn off gas and remove burner.
- 10. Use tongs to remove crucible.
- 11. Allow to cool on lab bench.
- 12. Measure combined mass and record on data table.
- 13. Note appearance of the product and dump into waste container.

Pre lab questions #1-4 on separate sheet

Data Tables: Trial #1 Mass of crucible and lid, g| 30. 759 g| Mass of crucible, lid, and silver oxide, g| 31. 387 g| Mass of crucible, lid, and silver metal, g| 31. 344 g| Appearance of product| White, chalk like| Trial #2 Mass of crucible

and lid, g| 31. 300g| Mass of crucible, lid, and silver oxide, g| 31. 734g| Mass of crucible, lid, and silver metal, g| 31. 701g| Appearance of product| White, chalky| Trial #1 Trail #2 Mass of AgO| 0. 628 g| 0. 434 g| Mass of Ag| 0. 585 g| 0. 01 g| Mass of O| 0. 043 g| 0. 033 g| % Ag| 93. 2%| 92. 4%| % O| 6. 8%| 7. 6%| Moles Ag| 0. 00542 moles| 0. 00402 moles| Moles O| 0. 0027 moles| 0. 0021 moles| Mole Ratio| 2: 1, Ag2O| 2: 1, Ag2O|

Post Lab Questions and Calculations: #1-4, 6, and 7 calculations on separate sheet 5. (2) Ag2O -> (4) Ag(s) + (1) O2 (g) 8. The sources of error that might account for the higher percent yield could be a measurement error, since putting too much Ag2O could affect the outcome of the experiment by increasing the time needed it to heat.

Another error could be the heating time, since the product might have been heated for too long or too short. Conclusion: The present composition of a compound tells us which elements are present in the compound and their mass ratio. Since all the atoms of a given element in a compound have the same average atomic mass, the elements that are present in a fixed mass ratio in a compound must also be present in a fixed number ratio as well.

The empirical formula describes the composition of a compound in terms of the simplest whole-number ratio of atoms in a molecule or formula unit of the compound. In this experiment, according to the law of conservation of mass, the total mass of the products must equal the mass of the reactants. The mass of silver oxide must be equal to the mass of the silver meal along with the mass of the evaporated oxygen. Therefore, that was how the percent composition of silver oxide was figured out.