CHEMISTRY LAB
COPPER -- SILVER NITRATE REACTION

INTRODUCTION

In this experiment you will mass solid silver nitrate ($AgNO_3$) and prepare a water solution of it. You will also mass a piece of coiled copper wire, place it in the silver nitrate solution and observe the reaction. By massing the copper wire at the end of the experiment, you will be able to determine the amount of copper reacted. Using these and other measurements, you will be able to determine a quantitative relation between reactants and products. What are the quantitative relations between reactants and products?

WEAR SAFETY GOGGLES AND DO NOT TOUCH THE SILVER NITRATE.
WASH YOUR HANDS AT THE END OF THIS LAB ACTIVITY.

PURPOSE: To determine the quantitative relation between reactants and products.

PROCEDURE

1. Obtain a 30 cm length of copper wire. Coil the copper wire by wrapping it around a pencil. Measure and record the mass of the copper wire. Record your balance number and use the same balance for all mass measurements.

2. Label a large test tube with your name and period number. Add about 20 ml of dH_2O to the test tube. Mass a piece of filter paper and set the balance 2.00 g heavier. The instructor will add $AgNO_3$ to the filter paper until the balance pan moves down. Determine the mass of the $AgNO_3$ and filter paper to the nearest 0.01g. Add the $AgNO_3$ to the test tube stir to dissolve. **CAUTION: Silver nitrate will stain your skin and clothing, so be sure not to get any solid or solution on them.**

3. Place the test tube containing the silver nitrate solution in a test tube rack. Add the copper wire to the silver nitrate soltuion in the test tube, leaving enough copper wire above the solution to make it easy to remove the copper from the test tube.

4. Record your observations of the reaction in the observation table. Allow the reaction to continue overnight.

5. Label a clean, dry 150 ml beaker with your name and period number. Measure the mass of the beaker.

6. Remove the copper wire and shake the crystals from the wire into the 150 ml beaker. Rinse the copper wire with distilled water from a wash bottle into the 150 ml beaker. Allow the copper to dry and mass it.

7. Empty the contents of the test tube into the 150 ml beaker. Allow the silver crystals in the beaker to settle. Decant the liquid. Repeat this process 3 to 4 times.

8. Allow the silver to dry overnight in the assigned place. Measure the mass of the silver and beaker.

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OBSERVATION TABLE: Draw a 15 cm x 15 cm square. Divide the square in half with a vertical line. Label one side **OBSERVATIONS OF REACTIONS** and the other side **EXPLANATIONS OF REACTIONS**. Complete the table.

DATA TABLE

Mass of Cu wire before reaction	
Mass of filter paper	
Mass of filter paper plus $AgNO_3$	
Mass of 150 ml beaker	
Mass of Cu wire after reaction	
Mass of beaker plus Ag crystals	

ANALYSIS TABLE

Mass of Cu wire reacted (lost)	
Mols of Cu reacted	
Mass of $AgNO_3$	
Mols of $AgNO_3$	
Mass of Ag formed	
Mols of Ag formed	
Mols Ag/mols Cu	
Ag atoms	
Cu atoms	
Atoms Ag/atoms Cu	
Expected Result: mols Ag/ mols Cu	
Percent Error Ag/Cu	
Mols Ag/mols $AgNO_3$	
Expected Result: mols Ag/ $AgNO_3$	
Percent Error Ag/AgNO3	
One mole of Cu plus _____ mole (s) $AgNO_3$, in solution produces _____ mole(s) Ag plus one mole of $Cu(NO_3)_2$ in solution.	