

AP Chemistry Lab 1: Copper to Copper

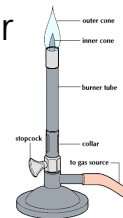
Materials:

copper wire	250mL beaker	iron ring
concentrated HNO_3	Erlenmeyer flask	wire gauze
3M NaOH	graduated cylinders	Bunsen burner
6M H_2SO_4	stirring rod	funnel
mossy zinc	pipet	filter paper
scale	ring stand	



Procedure:

1. Measure 0.5 g of copper metal in a 250 mL beaker and add 5 mL of concentrated HNO_3 **in the hood**. Swirl the beaker to make sure that all the copper dissolves. While the reaction is occurring, leave your beaker in the hood and set up your Bunsen burner and ring stand.
2. After the reaction is complete, add 85 mL of water.
3. Add 30 mL of 3 M NaOH to the copper solution.
4. Gently and carefully heat the solution (frothing may occur). Heat the beaker and contents (stir occasionally) until they are totally black.
5. Allow the black precipitate to settle and decant. (Decant means remove the liquid with a pipet. The liquid can be poured into the sink.)
6. Add 20 mL of water, stir, allow the precipitate to settle, and decant again. While the precipitate is settling, you can use this time to put away your Bunsen burner and other equipment you no longer need.
7. Slowly add 15 mL of 6 M H_2SO_4 to the black solid and stir.
8. Add 2 g of mossy zinc to the copper solution and stir.
9. When the reaction is complete, filter the copper solid.
10. Add 10 mL of water to wash the precipitate, filter again, and weigh the copper. Then let it dry overnight.
11. Tomorrow you will need to weigh your copper again.
12. Clean up: Rinse all glassware. Return the Bunsen burner equipment to the cabinet (ONCE IT HAS COOLED!). Clean up any spills.



Data:

Your data should include any measurements as you complete each step. Make sure you accurately measure your starting mass of copper and your ending mass of copper. Calculate your percent error.

Mass of copper (starting) = _____

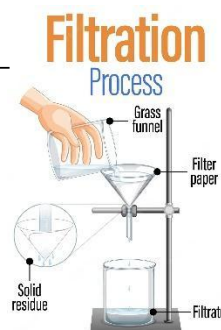
Mass of filter paper (before filtration) = _____

Mass of copper and filter paper (immediately after filtration) = _____

Mass of copper and filter paper (after drying overnight) = _____

Mass of copper (ending) = _____

% Error = _____



Questions:

1. After step 1, a compound is formed between NO_3^- and Cu^{+2} . What is the formula for this compound?
2. After step 3, a compound is formed between Cu^{+2} and OH^- . What is the formula for this compound?
3. After step 4, a compound is formed between oxygen and Cu^{+2} . What is the formula for this compound?
4. After step 6, a compound is formed between Cu^{+2} and SO_4^{-2} . What is the formula for this compound?
5. Copper can also have a charge of +1. If the copper ion in this lab had a charge of +1, then what would the formulas be for the compounds in questions 1-4?

