

Name:

Section:

Date:

### Lab - Percent of Copper in a Penny

#### Introduction

Modern pennies (minted after 1982) were made of zinc copper, with the zinc in the penny of copper. The actual value of a penny was more than half a cent in 1963. The US Mint began making pennies from a zinc metal with a thin outer coating of copper. In this lab, you will determine the percent composition of copper in a penny minted after 1982. The penny will be put in half and reacted with hydrochloric acid (HCl). The HCl will react with the zinc, but not the copper, leaving the copper behind after the reaction.

#### Procedure

##### STEP 1

- 1) Read the entire procedure and construct a suitable data table for the experiment.
- 2) Obtain a penny (minted after 1982), using the balance to weigh it. Weigh the penny several times on the edge of the penny, ensuring the zinc-water seal.
- 3) Find the mass of the penny to the nearest 0.01 g.
- 4) Place the penny in a clean 100 mL beaker.
- 5) Carefully add 20 mL of 6M HCl to the beaker without splashing. Place your beaker in a fume hood or a well-ventilated area for 20 hours.

##### STEP 2

- 1) Carefully remove the penny from the acid with the tongs and clean thoroughly with distilled water from your clean bottle. Rinse with distilled water and in the beaker will contain acid. All that is left of the penny is the copper coating.
- 2) Dry the penny in a desiccator, transfer the penny to the balance.
- 3) Weigh the penny and find the mass of the copper to the nearest 0.01 g.

#### Calculations and Questions

- 1) Calculate the percent composition of copper in the penny.
- 2) Calculate the percent composition of zinc in the penny.
- 3) Do the values for questions 1 & 2 add up to 100%? Should they add to 100%? Explain.
- 4) Given the accepted value for the percent of copper, calculate percent error for your lab.
- 5) The US Mint has been decreasing the zinc in the circulating the quantity of pennies for the past few years. What suggestions do you believe have been placed on both sides of the issue that have made the situation go in the penny?