**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Redox Pennies**

Background Information: Before 1982, U.S. pennies were made entirely of copper. The increase in the price of copper made this economically unfeasible. As a result, the inner core of the penny was changed to zinc and it was only coated with copper after 1982.

Guiding Question: Determine the percent composition of zinc and copper in a post-1982 penny.

Pre-lab Questions:

1. Which metal will react with the HCl? Why?
2. Write the balanced equation for the reaction that will occur in this lab.
3. What class of reactions is the reaction you wrote in question 2?
4. This reaction is also a REDOX reaction. Why?
5. Write the half reactions for the reaction of zinc and hydrochloric acid.
6. Predict whether the penny will have more copper or more zinc atoms. Defend your prediction with a reason.

Procedure:

1. Using a triangular file, score three places around the edge of the post-1982 penny. It needs to be deep enough to expose zinc.
2. Mass the penny and record it in the data table.
3. Place the penny in a 50 ml beaker, labeled with your last name.
4. Add 20 ml of 6M HCl. (You must have goggles on and be VERY careful!)
5. Place the beaker in a safe place overnight, as instructed by your teacher.
6. After 24 hours, carefully pour off the acid as directed. Gently rinse your penny and place it on a piece of filter paper. Let the penny dry overnight.
7. Re-mass the penny and record the mass in the data table.

Data:

Original Mass of penny: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g

Mass of copper coating of the penny: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g

Mass of the inner zinc core: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g

Calculations:

1. Calculate the percent by mass of copper and zinc in the penny.
2. How many moles of copper were in the original penny?
3. How many moles of zinc were in the original penny?
4. How many atoms of copper were in the penny?
5. How many atoms of zinc were in the penny?
6. Defend or amend your prediction in the pre-lab with evidence from the lab.

