

# Data and Observations

## The Hollow Penny

Observations of the Reaction between Hydrochloric Acid and the Pre-1982 Penny	
Observations of the Reaction between Hydrochloric Acid and the Post-1982 Penny	
Observations of the Pre-1982 Penny after being submerged in the Hydrochloric Acid Solution Overnight	
Observations of the Post-1982 Penny after being submerged in the Hydrochloric Acid Solution Overnight	

### Data Table. Pre-1982 Penny

Mass of Notched Penny Before Experiment	
Mass of Dry Penny After Experiment	
Mass of Penny Lost During Experiment	
% Weight of Copper in Penny	
% Weight of Other Metal(s) in Penny	

### Data Table. Post-1982 Penny

Mass of Notched Penny Before Experiment	
Mass of Dry Penny After Experiment	
Mass of Penny Lost During Experiment	
% Weight of Copper in Penny	
% Weight of Other Metal(s) in Penny	

## Post-Lab Questions

1. Calculate the mass of each penny lost, if any, during the experiment. Record these values in the Data Tables.
2. Did each of the pennies lose approximately the same mass during the reaction, or did they lose different amounts of mass?
3. Based on your observations, did the copper in each penny react with the hydrochloric acid? How do you know?
4. Look at the activity series in Table 1 of the background section. Should copper react with the hydrochloric acid? *Hint:* Should copper metal be able to replace hydrogen ions? Explain your answer.
5. Based on your observations, are the two pennies composed of the same metal(s)? Explain.
6. Looking at the activity series in Table 1 of the background section, propose a metal that could have been used to fill the inside of the post-1982 penny.
7. Write the chemical equation for the reaction between copper metal and hydrochloric acid. If no reaction occurs, write NR on the products side.
8. Write the chemical equation for the reaction between the metal you chose in Question #6 and hydrochloric acid.
9. Calculate the % weight of copper in each penny. Record these values in the Data Tables.
10. Calculate the % weight of any other metal(s) in each penny. Record these values in the Data Tables.
11. If the year were rubbed off a penny, how could you determine if the penny was pre-1982 or post-1982 without destroying the penny?
12. Why do you think copper pennies are filled with another metal instead of being made of pure copper?
13. Would it be a good idea to make pennies out of the pure metal you chose in question 6? Why or why not?
14. Describe an experiment that you could carry out in the lab to determine if the hypothesis you made in question 6 was a valid hypothesis.
15. If cost were not a factor, what would be the best metal out of which to make coins? *Hint:* Look at the activity series of the metals in Table 1 of the *Background* section.