

### Metal Reactivity Trends

**Purpose:** In this lab you will observe the reactions of several different metals in different solutions to determine the periodic table trends in metal reactivities.

**Safety:**

- Eye goggles must be worn at all times during this lab
- Silver nitrate ( $\text{AgNO}_3$ ) permanently stains skin and clothes

**Materials:**

Wellplate

Magnesium ribbon

Zinc wire

Copper wire

Steel wool

Silver

$\text{Mg}(\text{NO}_3)_2$

$\text{Cu}(\text{NO}_3)_2$

$\text{Zn}(\text{NO}_3)_2$

$\text{AgNO}_3$

**Procedure:**

- You will combine a small piece of each metal with each nitrate solution
- Each reaction requires its own well on your wellplate
- Devise a strategy for keeping track of which reaction is in which well
  
- Place a small piece of metal in a well plate (clean the surface by rubbing it with steel wool)
- Add 10-15 drops of a nitrate solution to the well and record your observations
- Repeat for all combinations of metal and solutions

**Data Table:**

Construct a data table that will allow you to neatly keep track of your reactions. Your observations should be organized in such a way that someone who did not do the lab should be able to understand your results just by looking at your table. Use a straightedge and be neat.

**Analysis Questions:**

1. Which metal reacted the most with the solutions?
2. Which metal reacted the least with the solutions?
3. List the metals you tested in order of their reactivity, starting with the most reactive metal.
4. Using the previous answer, explain why zinc is used on the inside of a penny and not the outside.
5. Which of the metals that we investigated might be an even better choice for the outside of a coin? Why is this metal rarely used in coins?
6. Given your new knowledge of the chemical reactivities of these four metals, which one do you think is most often found ...
  - a. Not chemically bonded to another element in nature?
  - b. Chemically bonded to another element in nature?
7. Using your results from this lab and your periodic table, describe the trend in metal reactivity as ....
  - a. You go down a group
  - b. You go across a period from left to right