

Predicting the Metal Activity Series

Objectives:

- Rank a list of metals in order of increasing activity
- Relate metallic activity to the rate of oxidation

Materials:

- 1 M HCl solution
- 7 test tubes
- test tube rack
- Metal samples (Al, Mg, Sn, Zn, Pb, Fe, Cu)
- Disposable pipet

Prediction:

1. Predict the reactivity of the metals listed in Materials. Put them in order from least reactive to most reactive. Describe what you based your prediction on.

Procedure:

1. Using a pipet put ~ 2 -3 mL of the HCl solution into each test tube. The important part is that you have approximately the same amount in each test tube.
2. Label each test tube with the type of metal it will contain.
3. At the same time drop the metal samples into their respective test tubes and immediately start observing and recording the reactions.
4. Based on your observations of the reaction rates, rank the metals from least to most reactive.

Questions:

1. List the metals in order placing the least reactive metal first.
2. What observation(s) indicated that the metals were reacting?
3. Which metal is **most likely** to be found in an uncombined, or “free” metallic state in nature? Explain.
4. Which metal is **least likely** to be found chemically uncombined with other elements? Explain.
5. Write a chemical reaction for what occurred when you put the magnesium metal into the hydrochloric acid, HCl.