



LAB – REACTIVITY TRENDS IN THE PERIODIC TABLE

Periodic trends include both physical and chemical properties of elements. In this investigation, find out if (and how) the reactivity of metals relates to their position on the periodic table.

Question: Is there a relationship between the reactivity of a metal and its position in the periodic table?

Safety:

- Hydrochloric acid can burn skin. _____ is the chemical formula for hydrochloric acid.
- Do not handle _____ with your bare hands. Use the forceps instead.
- Clean up any spills and inform your teacher immediately.
- You must be wearing your goggles and apron until you have finished cleaning up your lab station.

Procedure:

1. **Read the procedures completely** and then design a table to record your observations below.
2. Using a spot plate place one piece of each type of metal (calcium _____, magnesium _____ and aluminum _____) into a separate well. Do not pick up the calcium with your hands, use the forceps.
3. Fill a beaker half full with water. Using the dropper add 3-5 drops of water into each well that contains a piece of metal. Record your observations.
4. When the reactions stop, dispose of the liquid as directed by your teacher. You will use the magnesium and aluminum metals again for the next step.
5. Add 3-5 drops of hydrochloric acid (HCl) to the remaining magnesium and aluminum samples. Record your observations and indicate the relative reactivity of each metal.
CAUTION: Be very careful when working with the hydrochloric acid. Acid can burn your skin. If you spill any acid solution on your hands, rinse it off immediately with cool water and inform your teacher.
6. Clean up your work area and dispose of materials as directed by your teacher.

Prediction: I think _____ metal will be the most reactive.

Observations:

Table 1: _____

Analyze and Interpret:

1. Compare the reactivities of magnesium and calcium. Use evidence to support your comparison.
2. Compare the reactivities of magnesium and aluminum. Use evidence to support your comparison.
3. Which of the three metals was the most reactive? Which metal was the least reactive?
4. Did you make quantitative or qualitative observations during this lab?

Conclude and Communicate

1. a) Draw Bohr diagrams for magnesium, calcium and aluminum.

b) Does your understanding of atomic structure support your observations from this investigation? Justify your response.

Apply and Innovate:

1. What other metals could you test this way? Suggest two or three additional metals that you could test.