

Skills and Strategies

- Processing and Analyzing
- Evaluating
- Communicating

Safety

- 1 mol/L hydrochloric acid can cause burns. Inform your teacher immediately of any spills. If any hydrochloric acid contacts your skin, flush the area with cold water for 15 minutes.

What You Need

- 2.5 g mossy zinc
- large test tube
- 50 mL beaker
- test tube clamp
- 5 mL 1 mol/L hydrochloric acid
- graduated cylinder
- 2 wooden splints
- matches
- ring stand

Safely Observing a Chemical Reaction

An important part of investigating matter involves observing what happens when different substances interact. In order to perform lab activities safely, including those that involve potential hazards such as splint tests and acids, it is essential to read and understand the procedure and safety precautions before you start.

One technique for identifying substances is to observe the effect on the substance of a flame or glowing ember. For example, when a flame is brought close to a source of hydrogen, the flame will ignite the hydrogen and produce a loud “pop” sound.

Question

How can a burning splint test be carried out safely to help you identify the element produced when zinc and hydrochloric acid are mixed?

Procedure

1. Work in pairs. Place 2.5 g of mossy zinc in a large test tube.
2. Place the test tube in a clamp and attach the clamp to a ring stand so that the mouth of the test tube is angled up and away from you. Attach the clamp about halfway down the tube.
3. Measure 5 mL of 1 mol/L hydrochloric acid in a graduated cylinder. CAUTION: 1 mol/L hydrochloric acid could cause burns and produce hazardous fumes.
4. Light a wooden splint with a match. Dispose of the match as directed by your teacher. CAUTION: If you are using gloves, do not wear them for this step.
5. Place the burning splint at the mouth of the test tube, then move the burning splint to the mouth of the graduated cylinder. Record your observations.

6. Extinguish the flame and dispose of the splint as directed by your teacher.
7. Carefully pour the hydrochloric acid into the test tube.
8. Wait 2 minutes. Then invert the small beaker over the top of the test tube.
9. Wait 90 seconds. Then repeat step 4.
10. Remove the beaker from the test tube. Then place the burning splint at the mouth of the test tube. Record your observations.

Evaluate and Communicate

1. Describe any changes you observed during the test.
2. What caused the bubbles to form when you added the hydrochloric acid to the zinc metal?
3. Why did you test the zinc metal and hydrochloric acid with the burning splint before mixing them?
4. What happened to the burning splint in step 10? Compare this to what happened in step 5. How do you explain the differences in what you observed?

