**Purpose:**

**Materials**

* watch glasses containing samples of elements
* conductivity meters
* vinegar
* test tubes
* test-tube rack
* dropper bottle
* spatula
* hammer

**Procedure**

Station 1 (Reactivity with Acid):

1. Determine the reactivity with acid of each sample by placing a small amount of sample into a clean test tube and adding 1-2 squirts of vinegar to each tube. (Note: Evidence for a chemical reaction may be the formation of gas bubbles and/or discoloration on the surface of the element. Some reactions may not start right away.)
2. Observe each tube and record results in the Data Table.
3. Rinse the tubes out with water and replace upside down on the rack.

Station 2 (Appearance and Malleability):

1. Observe and record the appearance of the element sample. Observations should include physical state, color, and other characteristics such as luster and texture.
2. Remove a small sample of each of the elements contained in a dish and place it on a hard surface designated by your teacher. Gently tap each element sample with a small hammer. If the element is malleable, it will flatten. If it is brittle, it will shatter. Record your observations. Wipe remaining substances into the bucket provided with a paper towel.

Station 3 (Conductivity):

1. Test the conductivity of the samples. Touch both electrodes (metal tips) to the element being tested, being sure that the electrodes are not touching each other. (see the back of the conductivity meter to know what the lights mean)
2. Record your results in your data table. If there is chemical residue on the electrodes rinse with the water provided and dry them off with a paper towel.

**Results**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Element | Reactivity with vinegar | Appearance and physical state | Malleable or brittle? | Electrical conductivity |
| **A** |  |  |  |  |
| **B** |  |  |  |  |
| **C** |  |  |  |  |
| **D** |  |  |  |  |

**Post Lab Questions**

1. Which of your elements would you classify as metal(s)? What evidence do you have to support that the elements are metal(s)?
2. Which of your elements would you classify as nonmetal(s)? What evidence do you have to support that the elements are nonmetal(s)?
3. Which of your elements would you classify as metalloid(s)? What evidence do you have to support that the elements are metalloid(s)?

1. **Each** individual element state if it is found to the **left, to the right, or touching the staircase** based on the type of element.

A: B: C: D:

1. You have 5.4 g of an unknown element. The element has a shiny red appearance, does not react with acid, is malleable, and is a poor conductor of electricity. Would you label it as a metal, nonmetal, or metalloid? Defend your answer.
2. You have an unknown element that is brittle and dull in appearance. Would you expect this element to be a good conductor of electricity or a poor/non conductor? Explain why.

**Conclusion:**