**Observing Physical and Chemical Changes** Name: \_\_\_\_\_\_\_\_\_\_\_\_

**Question:** What observations help to determine if a chemical or physical change has occurred?

**Procedure:** Follow instructions at each station and make observation both before and after. Observations should be **specific** eg. White solid powder, or clear liquid. Then decide what type of change occurred.

**Observations:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Observation |  | Type of Change |
|  | Substances | Before | After | Property | Physical  | Chemical |
| 1 | Baking Soda and citric acid | Both white powders |  |  |  |  |
| 2 | Salt and Water |  |  |  |  |  |
| 3 | Ice |  |  |  |  |  |
| 4 | Matches  |  |  |  |  |  |
| 5 | Sodium Carbonate,Calcium chloride |  |  |  |  |  |
| 6 | Copper metalMagnesium metal |  |  |  |  |  |
| 7 | Copper metalMagnesium metal |  |  |  |  |  |

**Process and Analyze**

1. List the changes that were **physical** What was your evidence?

*Eg. Station 8: Substance Z - evaporation is change of state which doesn’t change the chemical nature of the substance, and is reversible.*

1. List the changes were **chemical**. What was your evidence?
2. Evaluate: Which were the most difficult to classify? Why? What would have helped?
3. Refer to you notes and list TWO properties of metals that make them suitable for electrical wiring?
4. Summarize evidence you can use to identify chemical and physical changes.

**Station 1: Baking Soda and Citric Acid:**

1. Place 1 scoop of baking soda into one corner of a resealable plastic bag.
2. Add 1 scoop of citric acid into the *same* corner of the bag. Observe for changes.
3. Twist the corner of the bag so that the solid chemicals are isolated.
4. Add 3 ml of water in the other corner of the bag. Press the air out of the bag and seal the bag.
5. Untwist the corner of the bag and mix the contents. Record observation.
6. When Finished: rinse out bag with water at sink. Turn bag inside out to dry on drying rack.

**Station 2: Salt Water**

1. Add half a scoop of salt (about the size of an eraser on the end of a pencil) to a test tube.
2. Add water to about one-third of the test tube.
3. Place thumb on open end of test tube and shake to mix.
4. Record Observations.
5. When Finished: Rinse test tube well with water and return them to rack at the station.

**Station 3: Ice**

1. Put one small piece of ice into a small beaker, and cup the beaker in the palm of your hand for 3-5 minutes.
2. Record observations. Empty out beaker when finished.

**Station 4: Matches**

1. Record observations of match before, during, and after lighting.
2. When Finished: Discard burnt matches into beaker of water.

**Station 5: Sodium Carbonate (CaCO3) solution, Calcium chloride (CaCl2) solution**

1. ****Add 5 drops of sodium carbonate solution into a well of a spot plate.
2. Add 5 drops of calcium chloride into the same well. Record Observations.
3. Clean up: Rinse with water down the drain, wipe dry with paper towel.

**Station 6: Copper (Cu) metal and magnesium (Mg) metal in acid**

1. Scrub the copper metal with sandpaper until shiny
2. Add about 3 ml of Hydrochloric Acid (HCl) each to two small test tubes.
3. Drop in a piece of copper (Cu) in one tube and the strip of magnesium (Mg) in the other tube.
4. When Finished: pour contents through sieve over beaker to catch the metal pieces and rinse metals and tubes with lots of water. Acid is safe to go down the drain. Tubes to drying rack. 

**Station 7: Copper metal and magnesium metal in acid**

1. Light Bunsen Burner as per instructions. Adjust to proper flame 🡪
2. With crucible tongs, hold a piece of copper over the top of the inner blue flame, after observations, place hot metal on square wire mesh.
3. Do same for magnesium metal. If bright flash occurs, DO NOT look directly at flame.
4. Some metals are more malleable than others. How do you think this affects what materials engineers decide to use when building bridges?