Chemical Vs. Physical Change
Lab 2

Objective:

1. to differentiate between qualitative and quantitative observations
2. to differentiate between inference and observation
3. to differentiate between physical and chemical change

Background : Temperature conversions:

°C + 273 = K
K – 273 =° C
°C = (°F -32)÷1.8
°F =(°C x 1.8) +32

Research qualitative , quantitative, observation, inferences, physical and chemical changes and write 3 paragraphs of background information.

Hypothesis:

Safety:

Materials:

Safety goggles	Copper (II) Chloride
Beaker,	Aluminum foil
1 thermometer	Ammonium chloride
1 stirring rod	Barium hydroxide
spoon	Test tubes, 2
25 mL graduated cylinder	Test tube rack
Magnifying glass	

Pre lab questions:

1. What is the definition of endothermic and exothermic reactions.
2. Convert 16°C into °F.
3. List 4 indications that aid in identifying if a chemical change has occurred.
4. How does physical change differ from chemical change.
5. What do the safety symbols mean?

Procedure

Part I:

1. Obtain one level spoon full of the substance labeled Copper (II) Chloride. Be sure not to take a heaping spoonful, I'll be watching!
2. Describe at least 2 physical properties of the copper (II) chloride, and record these into data table 1. (be creative – use equipment to help make these observations.
3. Measure 25 mL of distilled water using your graduated cylinder.
4. Pour water into beaker, and carefully pour the copper (II) chloride into the beaker. Make at least 2 observations before you stir the contents.
5. Using the glass stirring rod, stir the mixture until the copper (II) chloride completely dissolved. Caution: do not look or smell directly above the beaker. Look off to the side. Record 2 more observations after you stirred.
6. Obtain an initial temperature of this mixture and record in data table.

7. Keep the thermometer in the beaker, and carefully place a loosely crumpled ball of aluminum foil into your beaker. Immediately record 3 observations.
8. Record temperature readings every15 seconds for 3 minutes. Stirring the mixture occasionally making observations.
9. Clean up for part 1:
    - Using tweezers on the chemical table place the once aluminum ball into the solid waste container.
    - Pour the remaining solution into the container labeled waste solution.
    - DO NOT POUR THESE DOWN THE SINK, when I tell you beaker is clean enough – go to a sink and wash with brush and soap.
    - Wipe down all other equipment (stirring rod, thermometer, etc.)

Data table 1

observations	temperature	
Dry crystal	Initial temp ℃	
	15 sec	
	30 sec	
Crystals in water	45 sec	
	1.00 min	
	1.15 min	
After stirring	1.30 min	
	1.45 min	
Immediately after adding Al	2.00 min	
	2.15 min	
During temp recordings	2.30 min	
	2.45 min	
	3.00 min	

Part 2:

1. Obtain approximately 4.00 g of Barium hydroxide and place in test tube. Record 2 observations in data table 2.
2. In a second test tube obtain 2.125 g of ammonium chloride. Use magnifying glass to help record 2 observations in your data table.
3. Immediately place thermometer into the test tube of barium hydroxide, and measure the initial temperature – record.
4. Place the Ammonium chloride into the test tube of Barium hydroxide. Make observations (be aware of smell!!!)
4. Record additional temperatures every 15 seconds for 3 minutes. Record additional observations.

Dispose of materials:

- The contents of both test tubes can be rinsed out with water and flushed down the drain with excess water.

- Wipe all equipment down
- Clean counter with spray
- Obtain clean up signature

Data table 2

Observations	temperature
Initial (Dry Barium hydroxide)	Initial °C
	15 sec
	30 sec
Initial (Dry Ammonium Chloride)	45 sec
	1.00 min
	1.15 min
When Mixed	1.30 min
	1.45 min
	2.00 min
	2.15 min
During temp recordings	2.30 min
	2.45 min
	3.00min

Analysis:

1. Construct a graph and plot both temperature recordings. Be sure to label the axis, and use different colors (or label) your line. TITLE too!
2. Make a list of 5 qualitative observations.
3. Make a list of 3 quantitative observations.
4. List the physical changes that occurred with a supporting statement for each.
5. List the chemical changes that occurred with a supporting statement for each.

Calculation:

1. For both reactions, show the temperature change in degrees Fahrenheit.

Conclusion:

Follow guidelines

Explain (infer) what happened in part 1

Come up with a use for what happened in part 2