

CHEMICAL CHANGES

PRE-LAB AND OBSERVATION TABLES

PRE-LAB:

1. Explain the difference between a physical and a chemical change:

Physical Change: **NO NEW SUBSTANCE IS FORMED, change of state (s) to (l) to (g) etc. , change in particle size**

Chemical Change: **NEW SUBSTANCE IS FORMED, different chemical formula**

2. Write down four different observations that can be used to indicate a chemical change:

a) **change in colour**

b) **evolution of gas (bubble) (a new gas)**

c) **evolution of heat and or light (absorb heat or light)**

d) **formation of a precipitate (cloudy solid formed in solution)**

Use the following tables to record your observations for all five reactions:

PART I: Hydrochloric acid and bromothymol blue:

Appearance of Hydrochloric Acid	looks like water
Appearance of Bromothymol Blue	looks like water with blue dye
Description of the Chemical Change	turns yellow
Evidence of Chemical Change	change of colour

PART II: Hydrochloric acid and sodium carbonate:

Appearance of Hydrochloric Acid	clear water like
Appearance of Sodium Carbonate	white powder
Appearance of Resulting Mixture	fizzed and bubbled
Evidence of Chemical Change	evolution of a gas

PART III: Cupric Sulphate and Iron Metal

Appearance of Cupric Sulphate Solution	blue crystals, makes a blue solution
Appearance of Iron Metal	brownish powder
Appearance of Resulting Mixture After Heating	blue with a copper coloured solid
Evidence of Chemical Change	change in colour

PART IV: Potassium Chlorate and Glucose (Gummy Bear)

Appearance of Potassium Chlorate Before Reaction	white powder
Appearance of Gummy Bear Before Reaction	gummy bear
Evidence of Chemical Reaction	light, heat, smoke

PART V: Lead Nitrate and Potassium Iodide

Appearance of Lead Nitrate Solution	clear water like
Appearance of Potassium Iodide Solution	clear water like
Appearance of Resulting Mixture	bright yellow opaque mixture
Evidence of Chemical Change	formation of a precipitate, change in colour

CHEMICAL AND PHYSICAL CHANGES - PROCEDURE FOR PART I AND PART II

PART I: Hydrochloric acid and bromothymol blue:

PART II: Hydrochloric acid and sodium carbonate:

1. Obtain two test tubes, a test tube rack, one 50 mL beaker, and a scoopula.
2. Carefully pour 20 mL of 1.0 M hydrochloric acid into the 50 mL beaker and carry it back to your work station.

CAUTION: hydrochloric acid can seriously damage your eyes - wear goggles, be familiar with the eye wash station. Clean up any spills immediately. If hydrochloric acid comes in contact with your skin, rinse with water thoroughly and speak to your teacher at once. If hydrochloric acid contacts your clothing, speak to your teacher at once.

3. Divide the hydrochloric acid evenly into the two test tubes, 10 mL in each test tube.
4. Obtain a small dropper bottle of bromothymol blue and using the scoopula a small amount (about the size of a pea) of sodium carbonate.
5. Look carefully at all three reactants and fill in the first two boxes in the observation tables for part I and part II.
6. Add five drops of bromothymol blue to one test tube, observe the contents of the test tube and fill in the third box in the observation table for part I. Use test tube tongs to help observe the reaction.
7. Using the test tube tongs, hold the second test tube over the sink and carefully add the sodium carbonate using the scoopula. Be prepared for the liquid level in the test tube to rise up. Record your observations in the third box in the observation table for part II.
8. Rinse the contents of both test tubes carefully down the drain and run the water tap for about one minute.
9. Clean the test tubes with a test tube brush and then return all equipment to the location where you got it.
10. Be sure that your sink is clean and that your work station is clean and dry.

CHEMICAL AND PHYSICAL CHANGES - PROCEDURE FOR PART III

PART III: Cupric sulphate and iron metal

CAUTION: Cupric sulphate is a skin irritant. Wash your hands with soap and water if you accidentally come in contact with cupric sulphate powder or solution.

1. Obtain a 250 mL beaker, retort stand, retort ring, wire gauze, Bunsen burner and a flint lighter. Assemble the equipment as shown at the front of the room.
2. Place 50 mL of tap water in the 250 mL beaker.
3. Measure out 10.0 g of Cupric sulphate on an electronic balance, using a plastic weighing dish. Add the cupric sulphate to the 250 mL beaker.
4. Carefully weigh out 3.0 g of iron filings. Place these filings to the side for later!
5. Record the appearance of the cupric sulphate solution and the iron filings in the observation table labeled part III. (first two boxes)
6. Call your teacher over to check your apparatus before you proceed!
7. Heat the cupric sulphate and water until it just boils.
8. Remove the heat source (shut off the Bunsen burner).
9. Add the iron filings and **stand back**.
10. If no reaction was evident call your teacher.
11. In the observation table carefully record both the appearance of the solution and the solid at the bottom of the beaker.
12. Clean up all equipment and return to the location you got it from.