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**PHYSICAL AND CHEMICAL CHANGE LAB**

PURPOSE

Recognize and distinguish between chemical and physical changes.

EQUIPMENT

Lab balance, lab burner, 5 test tubes , test tube rack, test tube holder, 2 watch glasses, microspatula, dropper pipet, mortar and pestle, magnet, safety goggles, lab apron or coat.

MATERIALS

Copper sulfate pentahydrate (CuSO4\*5H2O), sodium chloride (NaCl), hydrochloric acid (HCl), silver nitrate (AgNO3), sulfur (S), iron filings (Fe), magnesium ribbon (Mg), paper, birthday candle, matches

SAFETY

When heating a substance in a test tube, be sure the open end of the tube points *away from* yourself and others. Handle all acids with *extra caution*. Always wear safety goggles when handling acids. Report all acid spills to your teacher, and flush with cold water and a dilute solution of sodium bicarbonate (NaHCO3). Give heated glass ample time to cool before handling it. *Glass retains heat*. Tie back long hair and secure loose clothing before working with an open flame. Wear safety goggles and a lab apron or coat at all times when working in a lab.

PROCEDURE

Note and record all observations in your data table.

1. Place a small amount of wax from a birthday candle on a watch glass. Next, light the candle, secure it to a glass square, and allow it to burn until it extinguishes itself. Proceed with the rest of the experiment while the candle burns.

2. Tear a piece of paper (about 5 cm X 10 cm) into small pieces. Set a watch glass on an insulating square and place the pieces of paper on the glass. Ignite the paper with a match and allow to burn.

3. Add a microspatula of NaCl (sodium chloride) to a small quantity of water (about 5 ml) in a test tube. Shake the contents of the tube. Next, use a dropper to add 10 drops of AgNO3 (silver nitrate) to the same test tube with the NaCl-Water mixture.

4. Obtain a piece of magnesium ribbon about 5 cm long. Tear the ribbon into 1-cm pieces. Place two of the pieces into a test tube and add a few drops of 6 *M* HCl (hydrochloric acid). **CAUTION**: *use extreme care in handling this acid. It will cause severe burns if allowed to come in contact with the skin.* Touch the bottom of the test tube with your fingertip.

5. Obtain a second piece of magnesium ribbon. Using crucible tongs ignite the end of the magnesium and hold it over a watch glass to catch the result.

6. Use a mortar and pestle to grind several crystals of CuSO4\*5H2O into a test tube. Heat gently over a burner flame for 5 minutes. Allow the sample to cool and then add a few drops of water.

7. Using a lab balance, measure out the following samples: 1.0g of iron fillings and 1.0g of powdered sulfur. Test each sample with a magnet. Mix the two samples thoroughly in a test tube. Run the magnet along the bottom and sides of the test tube. Next heat the test tube over a flame for approximately 5 minutes. Immediately drop the hot test tube in a beaker of water.

8. Heat the iron-sulfur mixture in a burner flame for several minutes until the mixture “glows.” Immediately drop the hot test tube in a beaker of water. With tweezers take the result out of the water and test it with the magnet.

OBSERVATIONS AND DATA

Record all qualitative observations for each step of the procedure.

|  |  |
| --- | --- |
| Experiment | Observations |
| Burning candle |  |
| Melting candle |  |
| Burning paper |  |
| NaCl + H2O |  |
| NaCl solution + AgNO3 |  |
| Mg + HCl |  |
| Burning Mg |  |
| Grinding CuSO4\*5H2O |  |
| Heating CuSO4\*5H2O |  |
| Mixing S + Fe |  |
| Burning S + Fe |  |

CONCLUSIONS AND QUESTIONS

1. Indicate whether the following changes are physical or chemical. Support your conclusions.

|  |  |
| --- | --- |
| Experiment | Physical or chemical? |
| Burning candle |  |
| Melting candle |  |
| Burning paper |  |
| NaCl + H2O |  |
| NaCl solution + AgNO3 |  |
| Mg + HCl |  |
| Burning Mg |  |
| Grinding CuSO4\*5H2O |  |
| Heating CuSO4\*5H2O |  |
| Mixing S + Fe |  |
| Burning S + Fe |  |