Experiment 6 Stamp:
Name:

Partners' name(s):

Laboratory 6: Matter and Its Changes Part 2

Lecture Notes

1. Chemical Composition

What is a chemical formula?

What is a chemical equation?

Materials: Gumdrops, toothpicks
Using the gumdrops and toothpicks, make an example of each of the following and sketch what the result looks like.

Molecule	Formula or Symbol A Sample	of a Compound
A sample of a monatomic element		A sample of a diatomic element
A sample of a mixture made of 1 compound and 1 element		A sample of a mixture made of 2 different elements

B. Using Chemical and Physical Properties to Identify an Unknown Substance

At the reagent bench are samples of 7 common substances. Your instructor will assign you an unknown, which is the same as one of the 7 known substances. Based on the observations of the chemical and physical properties of the known and unknown substances, you will determine the identity of the unknown. Procedures 3-5 do not need to be done in order. You will perform all of the tests on the unknown that you perform on each of the known samples.

1. Observe each sample, including the unknown, and then record your observations as to the color, texture and any other important properties in table 1.

1. In a spot plate place small pea-sized amounts of each substance in 2 different rows of wells. Be careful to note which substance is in which well. Do not use more than a small pea-sized amount, or it will be difficult to perform the tests. (On a paper towel write the name of each substance in the order it is placed in your spot plate, and place this paper towel next to the spot plate.)

2. a. Into the first row of wells of the different substances, put about 1 ml of de-ionized water. See if the substances dissolve completely or partially, or change in any other way. Record any evidence of change that occurs in table 1.

   b. In the row of wells that contains the substances mixed with water, put 3 drops of universal indicator. Record any evidence of change in table 1.

3. In the other row of wells containing the samples put 3 drops of dilute acetic acid (vinegar) and record any evidence of change in table 1 below.

4. Cover your wire gauze with a piece of the aluminum foil that is set out on the reagent bench. Place about pea-sized amounts of each substance onto the foil covered gauze. Make sure there is plenty of space between each sample on the foil. Place the gauze on the ring stand and ring apparatus that is in the fume hood. Light the burner and place the heat under each sample to see if any change occurs. Record any evidence of change in table 1.

Using the data that you recorded in table 1, determine the identity of the unknown sample and answer the questions that follow the table.

Table 1: Determining the identity of an Unknown substance

	Appearance (1)	Change with water (2)	Change with universal indicator (3)	Change with acetic acid (vinegar) (4)	Change with heat (5)
Sodium Chloride					
Sugar (Sucrose)					
Baking Powder					
Baking Soda (Sodium Bicarbonate)					
Citric Acid					
White Flour					
Calcium Carbonate					
Unknown #					

Unknown # _____

Based on you observations in the above table identify the unknown_____

Explain the reason for you answer to the above question:

<u>Procedure and Observations and Data:</u> To be done in groups of three

A. Separating ink (Do procedures A and B during the heating and cooling process of part C)

Obtain a coffee filter. Cut out four long strips from the coffee filter that are about 1 cm wide. On each strip place one dot from one of the pens. Repeat for each of the different pens on different strips. Place the strips into a 250 ml beaker containing about 20 ml of water. Make sure the end of the paper closest to the ink dot is in the water but that the dot is above the water. Remove the strips before the water reaches the top of the strip. Record your observations**.**

Draw a color diagram of what you saw at the end of the procedure

Conclusions and Reflections

How would you explain the difference between a compound and a mixture to a 4^{th} grader?

What has been most helpful in learning the difference between compounds elements and mixtures? What has been least helpful?
