Physical Science 9

MIXTURES LAB

INTRODUCTION: In this lab you will study some of the differences between the two major types of mixtures, SOLUTIONS and SUSPENSIONS.

PROCEDURE 1: *ONE + ONE DOES NOT ALWAYS = TWO.*

1. Fill a graduated cylinder with 25 ml of tap water.
2. Fill another graduated cylinder with 25 ml of alcohol.
3. Pour the water into the graduated cylinder containing the alcohol.
4. **Record the volume of the mixture.** _____

A. Usually 25ml +25ml =50ml. How can you account for the missing milliliters? (hint: water molecules are smaller than alcohol molecules)

B. Use the particle model to draw a diagram of the mixture. Label the molecules. (see page 396)

PROCEDURE 2: *COMPARING SOLVENTS*

1. Fill a test-tube with one inch of distilled water.
2. Fill another test-tube with 4 dropperfuls of alcohol.
3. Place similar-sized iodine crystals into each tube and set them aside.

SAFETY CAUTION - IODINE IS POISONOUS AND WILL STAIN CLOTHING.

4. Check the tubes carefully each minute for 5 minutes. Rinse the mixtures down the drain and rinse out the test-tubes three times.

C. Which solvent seems to be better for dissolving iodine?

PROCEDURE 3 - *MAKING AN EMULSION*

1. Fill a test-tube with one inch of distilled water.
2. Add one ml of oil to the water.
3. Put a cork into the tube. Shake gently for about 30 seconds.

D. What happens to the mixture after you stop shaking it?

4. Add one ml of dish soap to the mixture. Put the cork in again and shake gently for about 30 more seconds. The mixture is now called an EMULSION.

E. What happens after you stop shaking the emulsion?
F. Based on this evidence, how does soap help us clean oily or greasy dishes?

Rinse the emulsion down the drain with warm water. Scrub the test-tube until it is clean.

PROCEDURE 4 - *DISSOLVING SOLIDS IN A LIQUID*

1. Fill one beaker with 50 ml of ice cold water.
2. Fill another beaker with 50 ml of hot tap water.
3. Place a sugar cube into each beaker at the same time. Let the beakers stand. Do not stir. Record your observations below.

G. Write a statement that describes the relationship between the water's temperature and its ability to dissolve solids.

4. Fill two beakers, each with 50 ml of tap water of the same temperature.
5. Weigh two samples of granulated sugar in different pans, one gram of sugar in each pan.
6. Pour the samples into the beakers at the same time. Stir one mixture until the sugar is dissolved. Do not stir the other. Record your observations below.

H. Write a statement that describes the relationship between the movement of particles and water's ability to dissolve them.

7. Fill two beakers with 50 ml of tap water.
8. Obtain two samples of granulated sugar, one gram of sugar in each pan. Grind one sample until it is a fine powder (about 60 sec).
9. Pour the samples into the beakers at the same time. Record your observations below.

I. Write a statement describing the relationship between the size of particles and water's ability to dissolve them.

PROCEDURE 5 - *MAKING A SUSPENSION*

1. Fill a beaker with 20 ml of distilled water . Add 1/2 spoonful of starch. Stir for about 30 seconds. This mixture is called a SUSPENSION.
2. Place this mixture aside. Continue on to Procedure 6 and then return to this procedure in a few minutes.

3. After returning to this procedure, record the following observations:

IS THE MIXTURE TRANSPARENT OR CLOUDY? _____
IS THE COLOR THE SAME THROUGHOUT? _____
HAS ANYTHING SETTLED TO THE BOTTOM? _____

4. Stir the mixture again and pour HALF of it through an unused filter paper and collect in a test-tube or beaker. You need the other half for comparison. Has anything been trapped by the filter? _____

J. How do the size of the particles in a suspension compare to the size of particles in a solution? How do you know?

K. Other than particle size, describe two properties of solutions and compare them to suspensions. (Hint: look at the answers to the questions in capitol letters)

PROCEDURE 6 - *MAKING A SOLUTION*

1. Fill a beaker with 20 ml of distilled water. Add a 1/4 teaspoon of copper chloride. Stir until all the crystals are dissolved. This mixture is called a SOLUTION.

IS THE MIXTURE TRANSPARENT OR CLOUDY? _____
IS THE COLOR THE SAME THROUGHOUT? _____
HAS ANYTHING SETTLED OUT OF THE MIXTURE? _____

2. Pour HALF of the mixture through an unused filter paper and collect in a test-tube or beaker. You need the other half for comparison. Compare the two. Has anything been trapped by the filter? _____

3. Return to Procedure 5.

PROCEDURE 7 - *SEPARATING COLORS*

1. Place one strip of filter paper into the trough so that it just touches the bottom. Poke a stick through the strip near the top so that when the stick rests on the top of the trough, the bottom of the strip just touches the bottom of the trough. Repeat for all strips.

2. Using a pencil, label a strip at the top with the number of a pen. Using that pen, draw a horizontal line 2 cm from the bottom of the strip. Repeat for all pens.

3. Pour water into the bottom of the trough to a depth of 1 cm. Place the sticks back into the hole in the test strips. Set the sticks on the trough so the strips hang in the water. Make sure the ink line is above the level of the water.

4. Remove the test strips when the colors have traveled about 3/4 the way up the paper strip. Record the order of the colors for each pen on a data table.

L. Were there any inks that did not separate?

M. What is black ink a mixture of?

Include in your lab report:

1. Your names, the hour, and a title
2. Purpose statement
3. Materials list
4. Answers to all the lettered questions, A-M.
5. Include the data table from procedure 7.