

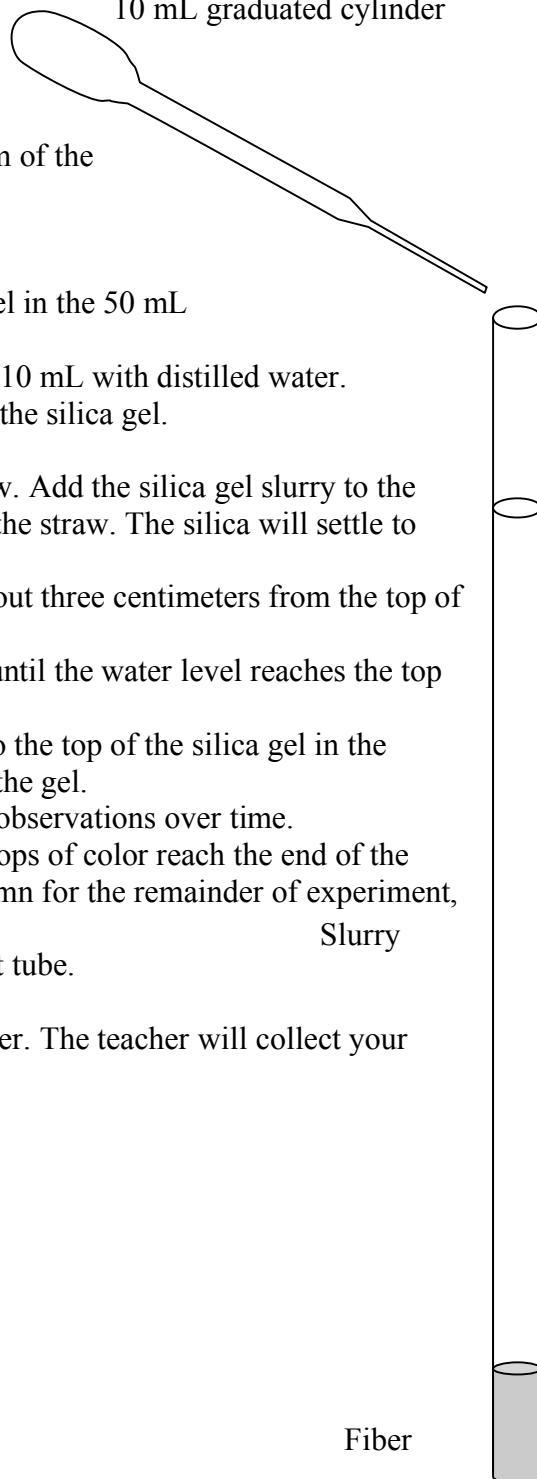
Purpose: Use liquid chromatography to separate a homogeneous mixture

Materials:

Clear drinking straws	Acetic acid, 5%	Green food color
Acrylic Fiber	Wash bottle	50 mL beaker
Silica gel (70-230 mesh)	Ring stand	100-mL beaker
Methanol	Extension clamp	Test tubes and test tube rack
Distilled Water	Microtip dropper pipets	10 mL graduated cylinder

Procedure

1. Take a small piece of acrylic fiber and put a plug in the bottom of the straw (about 1 cm).
2. Clamp the straw vertically to the ring stand.
3. Place a 100-mL beaker under the straw.
4. Place a small amount (one teaspoon or about 5mL) of silica gel in the 50 mL beaker
5. Add 2 mL of acetic acid to the graduated cylinder, then fill to 10 mL with distilled water.
6. Pour this mixture into the 50 mL beaker to form a slurry with the silica gel.
7. Draw some slurry into the dropper pipet.
8. Place the filled dropper pipet deep into the top end of the straw. Add the silica gel slurry to the straw dropwise taking care not go too fast or you will block the straw. The silica will settle to the bottom and the water/acetic mixture will rise to the top.
9. Continue filling the straw with the slurry until the slurry is about three centimeters from the top of the straw, but the water remains on top.
10. Allow the excess water to drain out the bottom of the straw until the water level reaches the top of the slurry, but do not allow the slurry to dry out.
11. Using a microtip dropper, add one drop of green food color to the top of the silica gel in the column. Wait a couple of minutes to allow the color go into the gel.
12. Add water to the top of the column continually, record your observations over time.
13. When the color bands are completely separate, or the first drops of color reach the end of the column, add methanol instead of water to the top of the column for the remainder of experiment, continue to record your observations over time
14. Collect the effluent from each band of color in a separate test tube.
15. Mix the different colors together and record the results
16. Clean up. Pour the liquid waste in the aqueous waste container. The teacher will collect your columns to recycle the straw and silica gel.



In the space below draw and color what the straw looks like at the indicated time during the lab.

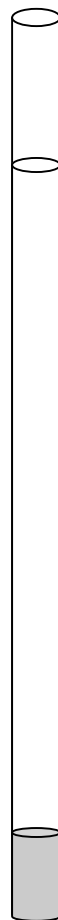
Just after the food coloring is added to the column



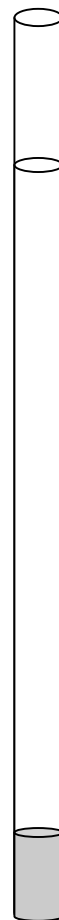
Five minutes after the food coloring is added to the column



When the methanol wash is started



At the end of the experiment.



Describe each effluent collected in the test tube.

Describe what happened when the test tubes of effluent were mixed.

Questions for Analysis

1. Define the following terms
 - a. Physical Change
 - b. Solution
 - c. Solvent
 - d. Solute
 - e. Homogeneous mixture
 - f. Effluent

Answer the following questions using the vocabulary above.

2. What do the results of this lab tell you about the green food coloring? How do you know?
3. What do the results of this lab tell you about the yellow dye? How do you know?
4. What do the results of this lab tell you about the blue dye? How do you know?
5. Which solute was more attracted to the silica gel? How do you know?
6. Which solute was more attracted to the water? How do you know?
7. Describe another experiment you could do with liquid chromatography. What could you do and what would it test.