LAB: USING CHROMATOGRAPHY TO IDENTIFY INKS

Purpose: Use chromatography techniques to separate inks from different pens, and identify the pen used in check forgeries.

Materials: 2 strips of chromatography paper
4 test tubes (from your lab station)
test tube rack (from your lab station)
4 different black ink pens
ruler

Procedure:

1. Cut the 2 strips of chromatography paper in half, lengthwise.

2. With one of the black markers, place a small dot about 1.5 cm from the bottom of one of the strips of chromatography paper. With a pencil, on the top of the paper write down the number or name of the marker used to make the dot. Also, draw a light pencil line about 1.5 cm from the top of the paper.

3. With the other 3 pens, place dots on the other 3 strips of chromatography paper, each about 1.5 cm from the bottom of each strip. THERE SHOULD ONLY BE ONE DOT PER PAPER. Label each paper, in pencil, with the number or name of the marker used to make each dot and draw a pencil line 1 cm from the top of the paper.

4. Place NO MORE than 1 cm (in depth) of water in each of your test tubes, and place in the test tube rack.

5. Carefully and slowly lower one of your paper strips into one of the test tubes, taking care that the ink dot <u>is above</u> the water level. Fold the top of the paper over the lip of the test tube so it stays in place. Do the same for the other 3 strips.

6. Observe the separation of the inks. When the water has traveled to your pencil line near the top of the paper, each strip from the water and lay on a paper towel. Carefully observe the differences among the 4 strips, noting the resulting colors, the order in which they appear, and the length of each color band. Record in the data chart.

7. Obtain the chromatography sample from the forged check. Compare with your suspects' samples. Do any of them match? If not, and time is available, obtain another pen and run another sample.

DATA

Pen # or name	Color and length (in cm) of band 1	Color and length (in cm) of band 2	Color and length (in cm) of band 3	Color and length (in cm) of band 4	Color and length (in cm) of band 4
Forged check pen					

CONCLUSION QUESTIONS:

1. Is pen ink a heterogeneous mixture, or a solution? Explain your answer.

2. Are the components of black ink all identical? Use evidence from your lab to support your answer.

3. Research paper chromatography on the web and answer the following questions:
   a. How does chromatography work? Use the terms *solubility*, *mobile phase*, and *stationary phase* in your explanation.

   b. What was the first use (application) of paper chromatography? (perhaps you've done this in a biology class).

   c. What other types of chromatography, besides paper chromatography, are there, and what are their uses? (you should find 2, at least).