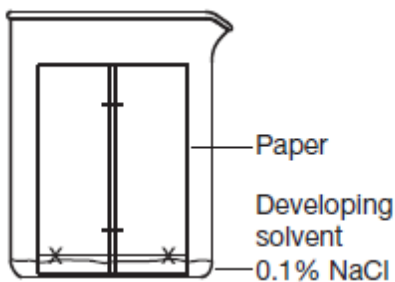


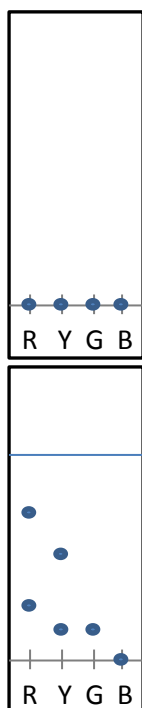
Food Coloring Analysis by Paper Chromatography

Dr. Slotsky Chemistry I



In this lab, we will separate food coloring into its component dyes by paper chromatography. Food dyes are spotted onto chromatography paper. The paper is hung into a beaker with a small amount of developing solvent, as shown to the left. As the solvent moves up the paper by capillary action, it carries food dye components with it. The most polar components move fastest, while less polar components move more slowly or not at all.

Start with a strip of chromatography paper. Draw a line in pencil (NOT PEN) about one inch from the bottom of the strip. Make 4 crosses on the line, and label them from below with R, Y, G, and B. Use the end of a paper clip to spot a tiny amount of red, yellow, green, or blue food coloring on each cross. Allow the paper a few seconds to dry. It should look like the example on the left, below.



Pour a half-inch of developer solution (50% isopropyl alcohol in water) into the beaker. Hang paper from a pencil, attached with a binder clip, into the beaker as demonstrated by your instructor. Allow the developer solution to rise up the paper until it is about 2/3rds the way up the beaker. This should take 5-10 minutes. Remove the paper strip from the beaker and quickly, before it evaporates, mark the edge of the wet portion with a pencil. This is known as the 'solvent front'.

When you are finished, your paper should look like the second example on the left – there should be one or more spots from each type of dye, and the solvent front should be marked as a line at the top.

Check the package – it has an ingredients list for all 4 dyes. Using the ingredient list as a guide, can you label each spot on your chromatogram with the corresponding ingredient (IE Red40, Blue2, Yellow5)?

Writeup – Attach Separate Sheet

1) Please attach a sketch of your group's chromatogram, with labeled spots and solvent front. Be as accurate and to-scale as you can.

HONORS) Calculate R_f for each spot, where $R_f = (\text{distance of spot from baseline}) / (\text{distance of solvent front from baseline})$. Use a ruler to measure!

2) Please list the food dyes from the ingredients list, from most polar to least polar.

3) Explain how this method could be used to identify dyes from various manufacturers.