Paper Chromatography

Chromatography is a technique used to separate substances dissolved in a mixture. The Latin roots of the word are *chromato,* which means "color," and *graphy,* which means "to write." Paper is one medium used to separate the components of a solution.

Paper is made of cellulose fibers that are pressed together. As a solution passes over the fibers and through the pores, the paper acts as a filter and separates the mixture's components. Particles of the same component group together, producing a colored band. Properties such as particle size, molecular mass, and charge of the different solute particles in the mixture affect the distance the components will travel on the paper. The components of the mixture that are the most soluble in the solvent and the least attracted to the paper will travel the farthest. Their band of color will be closest to the edge of the paper.

GENERAL SAFETY

Always wear safety goggles and a lab apron to protect your eyes and clothing. If you get a chemical in your eyes, immediately flush the chemical out at the eyewash station while calling to your teacher. Know the location of the emergency lab shower and eyewash station and the procedure for using them.

PROCEDURE

1. Use a lead pencil to sketch a circle about the size of a quarter in the center of a piece of circular filter paper that is 12 cm in diameter.
2. Write one numeral for each substance, including any unknowns, around the inside of this circle. In this experiment, six mixtures are to be separated, so the circle is labeled "1" through "6," as shown in Figure A.
3. Use a micropipet to place a spot of each substance to be separated next to a number. Make one spot per number. If the spot is too large, you will get a broad, tailing trace with little or no detectable separation.
4. Use the pencil to poke a small hole in the center of the spotted filter paper. Insert a wick through the hole. A wick can be made by rolling a triangular piece of filter paper into a cylinder: start

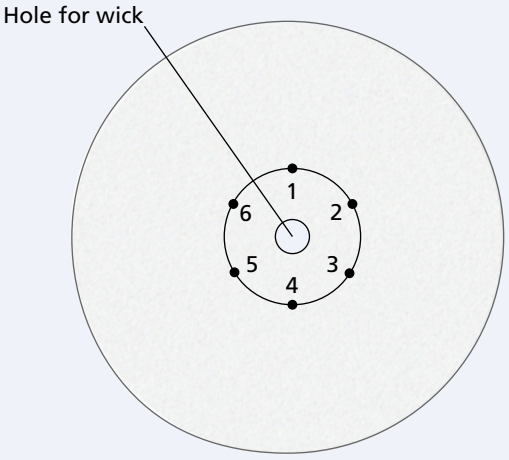

FIGURE A Filter paper used in paper chromatography is spotted with the mixtures to be separated. Each spot is labeled with a numeral or a name that identifies the mixture to be separated. A hole punched in the center of the paper will attach to a wick that delivers the solvent to the paper.