

Introduction

Chromatography is an important diagnostic tool for chemists. Many types of substances can be separated and analyzed using this technique. In this experiment, you will use paper chromatography to separate the dyes in water-soluble black ink.

Separating Ink Dyes

Safety Precautions: safety goggles

Problem

How many color bands will form when water is wicked through a black ink spot?

Materials

1. Two 150 mL beaker or cup
2. 11cm round filter paper (can be cut from white coffee filter)
3. $\frac{1}{4}$ section of 11cm round filter paper
4. scissors
5. pointed object
6. water soluble black felt pen marker (RoseArt brand works the best)

Procedure

1. Fill one beaker with water to about 2 cm from the top. Wipe off any water drops on the rim of the beaker.
2. Place the round filter paper on a clean, dry surface. Make a concentrated ink spot in the center of the paper by firmly pressing the tip of the pen or marker onto the paper.
3. Use a sharp object to create a small hole, approximately 3-4mm in the center of the ink spot.
4. Roll the $\frac{1}{4}$ piece of filter paper into a tight cone. This will act as a wick to draw the water. Work the pointed end of the wick into the hole in the center of the round filter paper.
5. Place the paper/wick apparatus on top of the cup of water, with the wick in the water. The water will move up the wick and outward through the round paper.
6. When the water has moved to within 1 cm of the edge of the paper, carefully remove the paper from the water-filled cup and put it on the empty cup to dry. A blow dryer may be used to facilitate drying.

Data and Observations

Tape at least a $\frac{1}{4}$ section of your filter paper into the data section of your lab notebook. Label the color bands.

Analysis

1. What is the physical means of separation you used to separate the ink dyes?
2. How many distinct dyes can you identify?
3. Why do you see different colors at different locations on the filter paper?
4. Was the separation of ink dyes a physical change or a chemical change? Explain.
5. Is the black ink an element, compound, or mixture?