

Separating Mixtures part 4-Chromatography

Purpose (Learning Target) Students will use the physical property of solubility to separate the dyes in ink pens.

Hypothesis: How could you use chromatography to separate a mixture?

If we use the method of chromatography & the physical property of solubility to separate the dyes in ink pens, then the action of capillary performed by the isopropyl alcohol separating the dyes by how soluble the dyes are.

Materials:

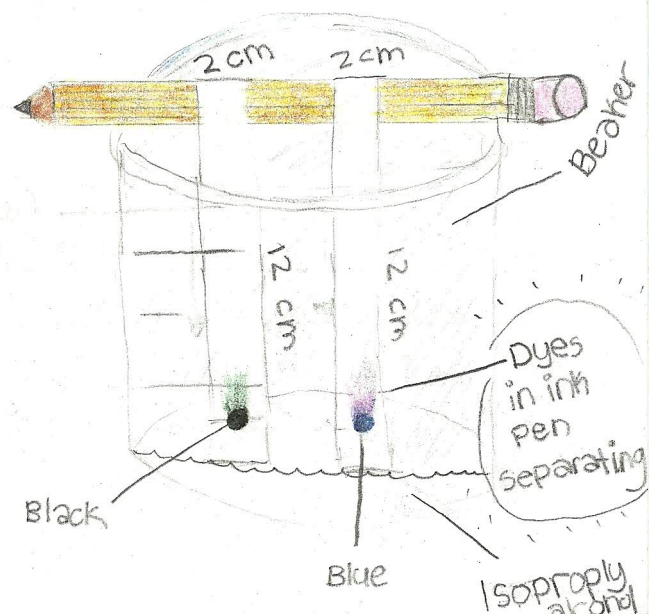
1. 400 ml beaker
2. isopropyl alcohol (25 ml)
3. Pencil
4. Filter paper (2cm by 12 cm strips)
5. Marking pens-black/color of choice.
6. Tape
7. Ruler

Procedure: Develop a procedure to test your hypothesis.

1. Draw a line two cm from the bottom across each of the strips.
2. In the middle of the line, make a dot with a black marking pen then repeat the process with the other marking pen.
3. Pour the isopropyl alcohol into empty 400 ml beaker, just so it fills the bottom.

Data/Results/Observations: Data Table needed for analysis question 3

Time(mi)	Color	Distance(mm)
2 mi	blue	11 mm
	black	10 mm
4 mi	blue	15 mm
	black	13 mm
6 mi	blue	16 mm
	black	14 mm
8 mi	blue	18 mm
	black	15 mm
10 mi	blue	19 mm
	black	15 mm



Analysis (Levels 1-4 are required) 1 /1

Level 1: Define solubility. Solubility is a physical property of a substance that has the ability to dissolved.

Level 2: Explain how you can use chromatography to separate mixtures. 1 /1

In this experiment we used chromatography to separate the mixture by dissolving the ink into the solvent (isopropyl alcohol.) Then when using capillary action, the dyes were separated depending on how soluble each the dyes were. The more soluble a dye is the further it will go.

Level 3: Using data you collected support why using chromatography is a good way to separate a mixture. Refer to your data table/drawings etc. 0.5 /1

Chromatography is a good way to separate a mixture because it efficiently separates the dyes in ink. In this experiment over the course of 10 minutes, the black ink traveled 15 mm, the blue had traveled 19 mm.

Level 4 Compare in detail the results of this lab to an outside occurrence. 1 /1

An outside occurrence of chromatography used in this experiment can be used by a forensic scientist. For instance if a scientist wanted to know if two different writing samples were written with the same pen, he would use chromatography to separate the dyes in the ink of the pen to see if they are the same.

Conclusion (Required)

3.5 /4

1. Conclusions must be written in paragraph form. Do not number or bullet a conclusion.
2. Restate the purpose / question/ problem.
3. Tell whether you accept or reject the hypothesis based on the results from this experiment.
4. What did you learn in this lab?
5. Now I wonder? (What are possible further experiments or questions that you could ask based on this experiment?)

The purpose of the separating mixtures lab part 4, was to use the physical property of solubility to separate the dyes in ink pens. My hypothesis was if we use the method of chromatography & the physical property of solubility to separate the dyes in ink pens, then the action of capillary performed by the isopropyl alcohol will separate the mixture. I would accept my hypothesis because the method of chromatography did separate the dyes in the ink of the pen. I learned that you can use chromatography to separate the dyes in ink pens. Now I wonder what could have happened if we had used a type of cloth, would the distance of the dyes change?