

Chromatography Lab Worksheet

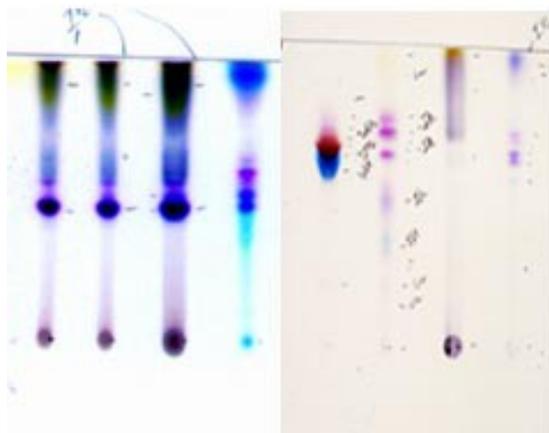
Chromatography is a way to look at complex mixtures by separating them into their components. Criminal investigators use this technology to identify substances such as drugs, blood, ink and other fluids.



Here's how it works:

Different inks have different properties, such as how much they can be dissolved in solvents. When you place chromatography paper into the solvent, the solvent begins to move up the paper. As the solvent rises, it dissolves the ink on the paper and separates the ink into its components. The farther the ink travels, the more it is attracted to the solvent.

A good understanding of solutions and mixtures and their components is essential for environmental engineers. Most experiments and data gathering done for the purpose of improving groundwater quality involve the preparation of solutions to monitor and test different conditions for contaminated water.



Ink brush and ink pen image source: 2004 Microsoft Corporation, One Microsoft Way, Redmond, WA 98052-6399 USA. All rights reserved.

Ink differentiation by TLC image source: WI Dept. of Justice, <http://www.doj.state.wi.us/dles/crimelabs/qd.asp>

Procedure:

1. Take the strips of chromatography paper and fold both pieces about an inch from the top.
2. Using the black Sharpie or black pen, draw a horizontal line near the other end of the chromatography paper. Make the line about as high off the bottom as the length of your thumb.
3. Use a pencil to suspend the paper in each beaker. Make sure the strip does not touch the sides of the beaker.
4. Carefully add water to one beaker and alcohol to the other. Add just enough of each liquid so that it touches the bottom of the hanging strip.
5. **Watch what happens!!** Once you see the ink separation is complete, get new strips and repeat using ink from a colored Sharpie marker, if time allows.

Data: (before, during, and after) - include a picture here or drawing with labels

Discussion/Conclusion: Write your answers in complete sentences.

1. What kind of change took place? Was it chemical or physical? How can you tell if the change was chemical or physical?
2. Why do we use chromatography?
3. How might a chemist use a similar process to analyze a sample containing mixed, colored substances?
4. What do the words heterogeneous and homogeneous mean? How do they apply to the substances in this lab?
5. **What are two other mixtures that can be separated by ordinary, physical means?**
6. Black ink is more attracted to which solvent? How do you know?
7. What colors are present in black ink?
8. What do these colors represent?
9. How might the ability to separating solutions into their components be important to environmental engineers looking into water quality issues?

References: