Experiment # 1 T-Shirt Chromatography

Name_____
Group Members_____
_____

Introduction:

1. Define chromatography
2. What is a solute? What is the solute in this investigation?
3. What is a solvent? What is the solvent in this investigation?
4. Why is a medium necessary in chromatography? What medium is used in this investigation?
5. Why is 2-propanol used instead of water in this investigation?
6. Why should you take care not to expose the 2-propanol to heat or flames?
7. Why do you think the ink will separate into its component compound?

Purpose: To use chromatography to separate a mixture.

Hypothesis:

Materials:
Chemical splash goggles
Laboratory apron without fabric softener
Elastic band
White cotton T-shirt, pre-washed
2-propanol
Dropper
Large plastic bag

Procedure:

1. Put on your goggles and lab apron. Stretch a single thickness of cloth of the T-shirt over the open top of the can or jar. Pull the cloth taut and secure it with an elastic band placed around the outside of the can or jar.
2. Select a marker and make a 5-dor circle that is about the size of a quarter at the center of the stretched fabric.
3. Fill a dropper with 2-propanol and slowly drip it onto the center of the circle. Caution: Make sure there are no open flames in your lab because 2-propanol is flammable. Continue dripping the 2-propanol onto the cloth until the solvent has spread to the edges of the can or jar.
4. Allow the wet section of the T-shirt to dry.
5. Repeat Steps 1-4 with each of the other markers, using a different color marker each time to make another set of dots or to make creative patterns. Record your observations.
6. If desired, repeat Steps 1-5 on a new section of the T-shirt.
7. After all the chromatography patterns have developed, allow the T-shirt to dry completely. Place the dry T-shirt in a plastic bag to bring home.
8. Dispose of any excess 2-propanol as directed by your teacher. Rinse out the can or jar and the dropper with water. Clean up your work are and wash your hands before leaving the laboratory.
9. At home, you can iron the T-shirt to help set the inks. For the first machine washing, wash the T-shirt by itself in case any of the inks run.

Observations:

Data Table

Color Trial	Observations
1.	
2.	
3.	
4.	
5.	

Analysis and Conclusions

1. Why was it necessary to stretch the cloth taut? What do you think would have happened if the cloth had remained loos?
2. Which marker contained the greatest number of compounds? The fewest? How were you able to tell?
3. What differences were there between your results and the predictions?
4. Explain how the components of each ink separate. What can you infer about the molecules making up the color that travel the greatest distance? The least distance?

Resource: Laboratory Manual, Prentice Hall CHEMISTRY Connections to Our Changing World