Chromatography Lab

Paper chromatography is a technique which permits one to separate the components present in a mixture. Two basic concepts underlie this process; capillary action and solubility differences of the components.

Leaving a corner of a paper towel in a dish of water demonstrates capillary action as the water molecules are attracted to the paper and move up the towel. If the end of a strip of paper were to come into contact with a solvent, the solvent would move up the paper due to capillary attraction to the paper. In general, the more soluble the component is in the solvent, the higher it will travel up the strip of paper; in addition, the component will travel even higher the less attractive it is to the chromatography paper.

Possible solvents: water, alcohol, peroxide, Sprite, vinegar, ammonia, bleach…

Possible papers: paper towel, filter paper, coffee filters, newspapers…

Possible inks: any marking pens, liquid ink pens (brown is usually a combination of colors)

Extra idea: What would happen if you applied the extraction from tree leaves to the chromatography paper? What changes, if any, would you have to make to investigate the extraction? (hint: in order to separate these pigments, they must be soluble in the liquid being used as the solvent.)

During lab:

1) set up code sequence for: solvent, paper, ink type/color

2) write code on notebook paper as well as chromatogram (as your are preparing it)

3) as chromatogram develops (drys) decide if there was a color separation. Note this on notebook paper. If no color separation note this as well. Keep chromatograms that did show a color separation in one stack and the ones that did not in another stack. Staple these to the notebook paper (and label them) when finished. Ones that don't work count as well as those that do show separations.

4) 20 - 24 strips = C 25 - 30 = B 30 + = A

Things you need to bring to lab if available: plastic cups, different types of absorbent paper, pencils or straws to lay across the cup and suspend the chromatograms, and the most important: **a variety of color markers, pens, inks**. I will provide the solvents and some papers and pens. On your notebook paper that you will attach the chromatograms please indicate the number of type of items you brought (for bonus credit).

Glurch Meets Oobleck

Some materials do not conform neatly to the designations for solids, liquids, and gases. For example, a colloid is a material that consist of one substance suspended within another. The suspended material is comprised of particles so small that they don't sink to the bottom of the second substance. Together, the two materials display properties unlike those of their separate components. Some examples: smoke (a solid suspended in a gas), fog, meringue, protoplasm, homogenized milk, synthetic rubber, and mayonnaise.

This lab is designed to study: -

viscidity (stickiness) –

resiliency (elasticity) –

fluidity (ability to flow)

You will soon realize that you must develop your own operational definitions for these properties (just how can you obtain quantitative data?)

After you make each colloid devise your own testing criteria and answer the questions found at the bottom of the page. Turn in the answers and your samples for your grade.

GLURCH:

1) obtain approximately 4 tablespoons of liquid laundry starch, 2 tablespoons of white glue, and a small pinch of salt

2) pour the starch into the cup, add salt, and stir until it is completely dissolved

3) add the white glue and stir about 30 times with the spatula

4) squeeze out the excess starch until the substance becomes doughy

5) remove from the cup and knead

6) if runny add a few more grains of salt

OOBLECK:

1) obtain approximately 4 tablespoons of cornstarch and 2 tablespoons of water

2) pour the water into the cup and add cornstarch a little bit at a time while stirring

3) when the mixture becomes too thick to stir, remove from the cup and knead

4) add a few drops of water if the oobleck is too crumbly

Questions:

1) If both colloids were poured, which would fill a container faster?

2) Which colloid would be better measured in mg than in mL?

3) Which colloid would make a better substitute for thumbtacks?

4) Which substance would make less noise when pulled up from a surface?

5) Which colloid would be more difficult to hide in your closed fist?

6) Which colloid would make a better emergency soccer ball?