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Experiment 1.

Capillaries Action of Compounds.

## **Summary/abstract**

Capillary action is the ability of liquid that can flow up through the tube or narrow space without gravity and other forces. We use capillary action to determine the unknown. The unknown is compound B because they have same color and the same Rf value which is 0.5428.

## **Object**

The aim of this experiment is mainly located on understanding of mixture that some could determine by capillary action from Chromatography paper, which we use of sample A, sample B and the unknown. Also to determine what is the unknown substance.

## **Introduction**

There are many ways to separate the substances such as evaporation, filtration, distillation, separated funnels. But in this case, we used the Thin Layer Chromatography also known as “TLC” to separate the substances. The first developed and utilized thin layer chromatography is by Schraiber in 1939(1). The evolution of Thin layer chromatography is improved directly in scientific method by using technique. The propose of Thin Layer Chromatography is the process that can separate the mixture of two or more phrases which has different matter. It is very easy to test and show the result. The mixture can be separated by travel at the different speed of the paper. The Chromatography plate is a sheet of glass, metal or plastic which covered by aluminium. The divided of mixture usually spotted in the bottom of the plate. It will slowly rises up the Thin Layer Chromatography plate by capillary reaction.

**Material and Method**

**Material**

Samples which are unknown, compound A and B.

Chromatography paper

Chromatography solvent

9:1 Petroleum Ether/Acetone

Pencil

Wood splints

Scissors

Stapler

Glass jar

Parafilm wrapper

Paper strip

**Procedure**

Part A: Laboratory Preparation:

Step 1: Obtain Chromatography paper and pen

Step 2: Drawing a straight line up from the bottom of paper which is a starting line from about 1 cm. to 1½ cm. And draw another straight line which is an ending line, about ½ cm.

Part B: Chromatography Testing:

Step 1: Draw a straight line on each sample. (3)

Step 2: Obtain a glass jar. Placing the paper in the jar, then pour the solvent in it. Make sure that the level of solution is not more than the height of the line. The line should not be sink in the solution.

Step 3: Put a paper strip into the glass jar then cover it with the Parafilm wrapper.

Step 4: Allow the solution to leak it up to the paper. When the solution line touches the ending line, get the paper out of the jar.

Step 5: Wash the solution from the jar by sink in a water.

Step 6: Draw the observation and label it.

Part C. Calculation of Rf Value

Step 1: In the Data/Observation part, calculate the Rf value to separate the pigment from the samples test. By use “Rf = distance of the sample / distance of solvent”

**Results**

Ten minutes after we’ve dropped the chromatography paper in the jar, the sample reached nearly the top of our ending line. Then we took the paper out and measure distance of an Unknown sample, compound A, and compound B are 3.8 cm, 7.0 cm, and 3.8 cm respectively. The color of the unknown sample and compound B are dark brown, and the color of compound A is brown.

|  |  |  |
| --- | --- | --- |
| Samples | Spot distance | Solvent distance |
| Unknown | 3.8cm | 7 cm |
| A | 6.2cm | 7 cm |
| B | 3.8cm | 7 cm |

## **Discussion**

From the result, the calculation of the Rf value of Unknown and sample B are 3.8/7 = 0.5428. Rf value of Sample A is 6.2/7 = 0.8857. Since the Rf value is a distance traveled by the spot divided by the distance traveled by the solvent. The Rf value of an Unknown and sample B are same so, we can conclude that unknown is a same substance with sample B.

From our observation in this experiment, samples were separated into their components by separating the physical differences between them. By use their different state to absorb. For the example, separate solid and liquid.

The samples must applied a spot above the level of the solvent to show that the capillary action works, and the spot will moves up with the solvent. So, we can know how far that the solution can travel.

If the solvent moves 8.0 cm and the sample moves 3.2 cm, to find the Rf value we should divided 3.2 by 8.0. That means the Rf value is 0.4.

The potential sources for error in this experiment are the glass jar maybe shake which can make our experiment result be incorrect. Or the line that draw maybe not at the 1.5 cm. and 0.5 cm. correctly, the result can be incorrect too.

## **Conclusion**

The unknown sample has the similar properties as Sample B because the unknown sample can travels as long sample B, and also the color is the same as well.

**References**

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