

# Paper Chromatography

## A. Objective

Students are expected to determine R<sub>f</sub> (Retardation Factor) value of a compound after experiment

## B. Theory

Paper chromatography is a liquid-liquid chromatography which has stationary phases in the form of a thin layer of water that is absorbed from humid air by the paper. In paper chromatography, the most of molecular components are distributed in a polar liquid which is easily adsorbed by the paper, and some of the components will be distributed in the eluent that flow up to the top edge of the paper. The components of a compound can be separated and distinguished by Retardation factor (R<sub>f</sub>) value. Basically, R<sub>f</sub> is the retardation factor of analyte fraction in the mobile phase on the chromatographic system. In planar chromatography, R<sub>f</sub> stated as a comparison between the travel distance of a component with a travel distance of eluent at the same time. The easier distribution parts in the water will quickly be adsorbed by the paper, so the trip is shorter. While the parts that are not distributed in the water, but in the eluent, will continue to flow to the top, so the trip is longer. It means that R<sub>f</sub> is larger than the previous sections which have the shorter trip. The stains components contained in compounds will make a straight line or a straight band. Eluent is allowed to rise up to the top edge of paper, which has been marked by boundary lines.

## C. Equipments :

1. Filter paper
2. Vessel developer
3. hanger rod

## D. Materials :

1. water soluble markers

2. aquades

#### D. Procedures

1. Scissors-sized filter paper (3 x 12) cm and create a flat line at a distance of 1 cm from the lower end of the paper.
2. Create a single point of the two kinds of marker (preferably different colors) on the line with a distance of 2 cm. Let the droplet dries in the air.
3. Arrange the paper chromatography apparatus as shown in VI.1 figure.
4. When the droplets are dry, insert the paper chromatography into jar containing aquadest (as solvent) as high as 1 cm, and then the jar was closed. Keep the filter paper did not touch the jar wall and the droplets did not dip of water by hanging the paper on the rod hanger.
5. Let the solvent rises to the top of filter paper approximately 10 cm, then the paper removed from the jar. Mark the upper limit of rising waters on the filter paper. Tick smudges of marker components are visible.
6. Measure the distance traveled component / stains and travel distance eluent.

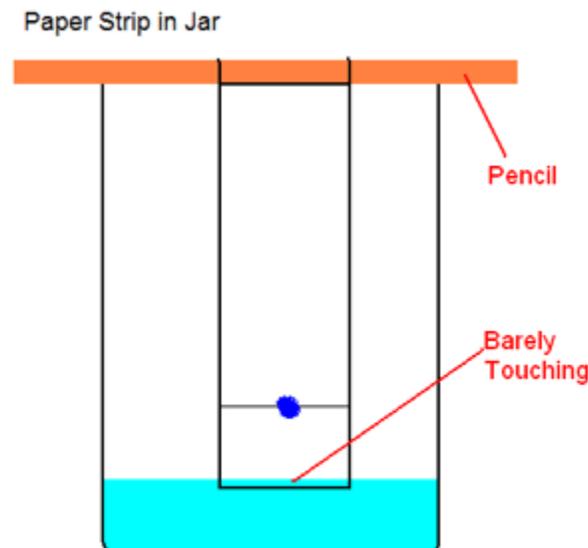


Figure VI.1 Paper Chromatography Apparatus

#### F. Task

1. Calculate the  $R_f$  values of each colored stains happen!
2. Conclude what can you suggest in this experiment!