Research and Reviews Journal of Chemistry

e-ISSN: 2319-9849
p-ISSN: 2347-2324

Editorial Note on Separation Techniques

Jalal Barzin

Department of Polymer Science, Faculty of Polymer Engineering Biomaterials, Iran Polymer and Petrochemical Institute, Iran

Editorial Note

Received date: 11/06/2021
Accepted date: 18/06/2021
Published date: 25/06/2021

***For Correspondence**

Jalal Barzin, Department of Polymer Science, Faculty of Polymer Engineering Biomaterials, Iran Polymer and Petrochemical Institute, Iran.

E-mail: jalalbarzin56@gmail.com

Keywords: Chromatography, Liquid mixture, Distillation.

EDITORIAL NOTE

Chromatography is a process for separating the various components of a liquid mixture. Michael Tswett, a Russian scientist, introduced it. In chromatography, the sample is dissolved in a solvent known as the mobile phase. A gas or a liquid can be used as the mobile phase. After then, the mobile phase is transferred via the stationary phase. A substance placed in a glass plate or a sheet of chromatography paper can be used as the stationary phase. The mixture's various components move at different rates, forcing them to separate. Column chromatography, TLC, paper chromatography, and gas chromatography are all examples of chromatographic methods. One of the most used chromatographic techniques is paper chromatography. The stationary phase in paper chromatography is paper, while the mobile phase is a liquid solvent. The sample is put on a spot on the paper and the paper is gently dipped into a solvent in paper chromatography. Due to capillary action, the solvent climbs up the paper, and the components of the mixture rise up at different speeds, separating them.

Centrifugation

Solid particles in a liquid can sometimes be so tiny that they pass through a filter paper. The filtering process cannot be utilised to separate such particles. Centrifugation is used to separate such combinations. Centrifugation is the technique of separating insoluble components from a liquid when conventional filtering fails. The size, shape, and density of the particles, as well as the viscosity of the medium and the rotational speed, all influence centrifugation. When particles are spun quickly, the denser particles are pushed to the bottom, while the lighter ones remain at the top.

A centrifuge is the device used to perform centrifugation. The rotor, or centrifuge tube holder, is the heart of the centrifuge. The rotor contains equal quantities of solid and liquid mixture in balanced centrifugal tubes. The centrifuge tubes rotate horizontally when the rotor rotates quickly, and the denser insoluble particles separate from the liquid owing to centrifugal force. When the centrifuge stops spinning, the solid particles fall to the bottom of the tube, while the liquid rises to the top.

Simple Distillation

Simple distillation is a process for separating components of a combination including two miscible liquids that boil without breakdown and have a sufficiently enough boiling point difference.

The distillation process entails heating a liquid to its boiling point, moving the vapours to a cool section of the apparatus, condensing the vapours, and collecting the condensed liquid in a container. The vapour pressure of a liquid increases as the temperature of the liquid rises in this process. The liquid enters its vapour state when the vapour pressure of the liquid and the air pressure equalise. The vapours travel through the heated section of the device before hitting the cold surface of the water-cooled condenser. When the vapour cools, it condenses and travels through the condenser, eventually collecting in a receiver through the vacuum adapter.

Fractional Distillation

Fractional distillation is used to separate a combination of two or more miscible liquids with a boiling point difference of less than 25K. Fractional distillation uses the same apparatus as simple distillation, with the exception that a fractionating column is placed between the distillation flask and the condenser.

e-ISSN: 2319-9849
p-ISSN: 2347-2324

A simple fractionating column is a glass bead-filled tube. The beads serve as a surface for the vapours to cool and condense on several occasions. Because of the repeated condensation and evaporation, the vapours of the liquid with the lower boiling point flow out of the fractionating column first, condense, and collect in the receiver flask when vapours of a mixture are passed through it. The other liquid, which has a little higher boiling point, can be collected in a receiver flask in a similar manner.