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Cost Effective Paper Chromatography Separation Study Mixture Of Amino Acids By Using Ivory Sheet

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Abstract :

Separation techniques are applied to chemicals for qualitative identification of various samples by different techniques. Separation methods used as Precipitation, Distillation, Sublimation, Extraction between two phases, Crystallization, Floatation[1], Ultrafiltration[2], Dialysis[3] and Electrodeposition. All these approaches, however, suffer from one kind of limitation or the other. It is also impossible to scheme all separation techniques into one classification scheme, because of the wide diverse properties on which separations are based.To overcome from all traditional techniques chromatography a valuable technique has been developed and invented by M.T. Swatt in 1906 for the separation, purification and identification of the constituents of chemical mixture.

Keywords : Floatation, Ultrafiltration, Dialysis and Electrodeposition, Diverse properties, M.T. Swatt. Qualitative, Sublimation, Extraction.

Introduction

Since the discovery, this technique has undergone tremendous modification and now a days different types chromatography techniques have been developed for separating almost any kind of given chemical mixture.Whether coloured or colourless into its constituents and to test the purity of these constituents.The applications of chromatography have grown explosively in the last four decades, owing not only to the development of several new types of chromatography techniques , but also due to the growing needs of scientists for better methods of separating the complex mixtures.

Chromatography techniques are-

1.Adsorption column chromatography

2.Partition column chromatography

3.Paper chromatography[4]

4.Thin layer chromatography

5.Ion exchange chromatography

6.Molecular sieves

7.Gel permeation

8.Gas chromatography

and 9.paper electrophoresis etc.

The development of paper chromatography by Consden Gordenand Martin has opened a new approach to the problem of resolving and detecting small amounts of substances in a complex biological mixture[5].

METHODOLOGY

Since long ivory paper is used for charcoal and watercolor painting. Ivory paper sheets are easily available in various thickness.Ivory paper is known for the evenness and fineness of its grains. Because of the uncoating surface of paper, slower movement of a solvent affords more equilibrium and sharper separation.Therefore Ivory paper sheet has been selected for qualitative analysis for different types of sample with comparative study over traditionally used filter paper. Filter paper which is presently used has blotting nature so colour spot and water solvent partially separate and spread.

Ivory paper sheet has following properties so it can be used for qualitative analysis of samples.

1.Low cost

2.Easily available

3.Better handling

4.Faster separation

5.Better defined bands

6.Faster staining

7.Better staining efficiency

8.Higher sensitive

Comparative study will be carried out for different types of sample for example-Amino acids, antibiotics, dyestuff, plant pigments and metal complexes etc. with Ivory paper chromatography and paper electrophoresis qualitative analysis techniques.

Paper chromatography and paper electrophoresis include five steps-

1.Spotting

2.Separating

3.Drying

4.Spraying and

5.Colour development.

Qualitative analysis of different types of sample carried out by following procedure-

1.Selecting appropriate mobile phase

2.Calculation of R_f value

3. Comparative study of R_f value with reported other R_f values

RESULTS & DISCUSSION

Although this technique was originally designed for the qualitative analysis of mixture, a number of publications have appeared in which numerous adaptations and improvements are described.

It has undergone explosive growth in the last 30 years . Paper chromatography has rapidly achieved widespread applications, because although HPLC(high performance liquid chromatography) is a useful preparative method ,paper chromatography is far more cost effective and convenient for the analysis of mixture.

Types of filter paper used for paper chromatography technique are- 1.Whatman filter paper No.1, 2.Whatman filter paper No.2, 3. Whatman filter paper No. 3, 4. Whatman filter paper No. 4, 5. Whatman filter paper No.7, 6.Whatman filter paper No.17

Chromatography is one of the widely used physicochemical methods of separation of inorganic and organic substances related in their composition and properties .

The above used chromatography filter papers are having following problems

1.Cost effective

2.Handling problem

3.Low sensitivity

To overcome from above problems novel paper i.e. Ivory paper has been applied in paper chromatography technique and paper electrophoresis for qualitative separation mechanisms.

Ivory paper sheet have many properties:

1.Low cost

2.Faster separation

3.Better defined bands

4.Faster staining

5.Better staining efficiency

6.Higher sensitivity

Conclusion

The conclusion of the proposed investigation is to use Ivory paper chromatography and paper electrophoresis techniques for qualitative analysis for different types of sample. Objectives are satisfactorly fullfilled as follows:-

1.Ivory paper for paper chromatography and paper electrophoresis of unknown samples can be used for better results.

2.Calculation of the Rf value would be easy.

3.Simultaneously when comparative studies have been carried out with other traditionally used paper chromatography and paper electrophoresis reveals more advantages.

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