

# Chrometography

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# Synopsis

- Introduction
- History
- Definition
- Principle
- Types of chromatography
- Application of chromatography

# Chromatography

- **Chromatography** (from Greek *chroma* "color" and *graphein* "to write") is the collective term for a set of laboratory techniques for the separation of mixtures. The mixture is dissolved in a fluid called the *mobile phase*, which carries it through a structure holding another material called the *stationary phase*. The various constituents of the mixture travel at different speeds, causing them to separate. The separation is based on differential partitioning between the mobile and stationary phases.

## Definition of chromatography

- Tswett (1906) stated that " chromatography is a method in which the components of a mixture are separated on adsorbent column in a flowing system".
- **IUPAC definition** (International Union of pure and applied Chemistry) (1993):

Chromatography is a physical method of separation in which the components to be separated are distributed between two phases, one of which is stationary while the other moves in a definite direction.

The stationary phase may be a solid, or a liquid supported on a solid or gel, the mobile phase may be either a gas or a liquid.

# History

Chromatography, literally "color writing", was first employed by Russian scientist Mikhail Tsvet in 1900. He continued to work with chromatography in the first decade of the 20th century, primarily for the separation of plant pigments such as chlorophyll, carotenes, and xanthophylls. Since these components have different colors (green, orange, and yellow, respectively) they gave the technique its name.

# PRINCIPLES

- Chromatography usually consists of mobile phase and stationary phase. The mobile phase refers to the mixture of substances to be separated dissolved in a liquid or a gas. The stationary phase is a porous solid matrix through which the sample contained in the mobile phase percolates. The interaction between the mobile phase and the stationary phase results in the separation of the compound from the mixture.

# Types of Chromatography

- There are following types of Chromatography
  - Paper Chromatography
  - Thin Layer Chromatography(TLC)
  - Gel Chromatography
  - Column Chromatography
  - Ion Exchange Chromatography
  - Gel Filtration Chromatography
  - Gas Liquid Chromatography
  - Affinity Chromatography

# APPLICATIONS OF CHROMATOGRAPHY

- The chromatographic technique is used for the separation of amino acids, proteins & carbohydrates.
- It is also used for the analysis of drugs, hormones, vitamins
- Helpful for the qualitative & quantitative analysis of complex mixtures.
- The technique is also useful for the determination of molecular weight of proteins.



Thank you