

# Chromatography and its Techniques by Chromatographic Bed Shape

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## DESCRIPTION

Chromatography is an experimental technique used to separate mixtures. The mixture dissolves in a liquid (gas or solvent) called the mobile phase and passes through a system column, capillary tube, plate, or sheet. The material is fixed, called the stationary phase. The various components of the mixture have different affinities for the stationary phase. Different molecules stay longer or shorter on the stationary phase, depending on their interaction with their surface sites. Therefore, they move at different apparent velocities within the moving liquid and thereby separate. Separation is based on the derivative distribution between the mobile and stationary phases. Subtle differences in the partition coefficient of a compound can result in different retention in the stationary phase, which affects separation.

## TECHNIQUES BY CHROMATOGRAPHIC BED SHAPE

### Column chromatography

Column chromatography is a separation technique in which a fixed bed is inside a tube. Particles of the carrier coated with the solid or liquid stationary phase can fill the entire internal volume of the tube (filled column) or accumulate on or along the inner wall of the tube. The internal mobile phase remains in the central part of the tube (open tubular column). Differences in migration rates in the medium are calculated based on the various retention times of the sample.

### Planar chromatography

Planar chromatography is a separation technique in which the stationary phase exists as a plane or on a plane. A flat surface is a paper that functions as itself, or a paper impregnated with a substance as a fixed bed (paper chromatography), or a layer of solid particles distributed on a support such as a glass plate (thin layer chromatography) obtain. The different compounds in the sample mixture travel different distances depending on the strength of their interaction with the stationary phase compared

to the mobile phase. This is of two types, paper chromatography and thin-layer chromatography.

### Paper chromatography

Paper chromatography is a technique for placing small dots or lines of sample solution on a strip of chromatographic paper. The paper is placed in a container with a flat layer of solvent and sealed. As the solvent rises in the paper, it encounters the sample mixture and the sample mixture begins to move onto the paper with the solvent. This paper is composed of the polar substance cellulose and the compounds in the mixture move further when the polarity is low. More polar substances bind faster to cellulosic paper and do not go too far.

### Thin-layer chromatography

Thin Layer Chromatography (TLC) is a widely used laboratory technique used to separate a variety of bio chemicals based on their relative attraction to the stationary and mobile phases. This is similar to paper chromatography. TLC is very versatile. Multiple samples can be separated in the same layer at the same time, which is very useful for screening applications such as testing drug levels and water purity. Since each separation is performed in a new layer, the possibility of mutual contamination is low. Compared to paper, it has the advantages of faster analysis, better separation, better quantitative analysis, and selection between different adsorbents. High-performance TLC can be used to further improve resolution and speed separation while reducing solvent consumption. Previously common use was chromosomal differentiation by observing spacing within the gel.

## CONCLUSION

Chromatography can be sorted or analyzed. Preparative chromatography is a form of purification as it is used to separate the components of a mixture for later use. Analytical chromatography is typically performed on small amounts of material and is used to determine the presence of an analyte in a mixture or to measure the relative proportions of an analyte. The two are not mutually exclusive.

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