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Commentary

Insights of High Performance Liquid Chromatography

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DESCRIPTION

HPLC is an abbreviation for high performance liquid chromatography. "Chromatography" is a separation technique, "chromatography" is the result of chromatography, and "chromatography" is a device for performing chromatography. Among the various techniques developed for chromatography, molecular separators called columns and high-performance pumps for dispensing solvents at stable flow rates are some of the key components of chromatographs. Only compounds dissolved in the solvent can be analyzed by HPLC. HPLC separates the compounds dissolved in a liquid sample, allowing qualitative and quantitative analysis of the components contained in the sample and the amount of each component.

Components

Includes solvent pump, degassing unit, sample injector, column oven, detector and data processor, similar to HPLC, the pump pumps the mobile phase at a controlled flow rate.

Air can easily dissolve in the mobile phase under the normal atmospheric pressure in which we live. If the mobile phase contains air bubbles and enters the feed pump, it can cause disturbances such as flow fluctuations and baseline noise/drift. The degassing unit helps to avoid this problem by removing air bubbles in the mobile phase. After the dissolved air is removed, the mobile phase is added to the column. The sample injector then introduces the standard solution or sample solution into the mobile phase. Changes in temperature can affect the separation of compounds in the column. The column is placed in a column oven to keep the temperature constant. Compounds eluted from the column are detected by a detector downstream of the column. The workstation processes the signal from the detector to obtain a chromatogram to identify and quantify the compound.

Procedure

HPLC can separate and detect each compound by the difference in the rate of each compound passing through the column.

HPLC has two phases, a mobile phase and a stationary phase. The mobile phase is a liquid that decomposes the target compound. The stationary phase is part of the column that interacts with the target compound. The stronger the in-column affinity between the component and the mobile phase (such as van der Waals forces), the faster the component will move in the column with the mobile phase. On the other hand, the stronger the affinity for the stationary phase, the slower the movement within the column. Figure 3 shows an example where the yellow component has a strong affinity for the mobile phase and moves quickly in the column, while the pink component has a strong affinity for the stationary phase and moves slowly. The rate of elution on the column depends on the affinity between the compound and the stationary phase.

Applications

Manufacturing HPLC:

It has many uses in both laboratory and clinical sciences. This is a common technique used in drug development because it is a reliable way to maintain and ensure product purity. HPLC can produce very high quality (pure) products, but it is not always the primary method used in the production of bulk pharmaceuticals.

Legal:

This technique is also used to detect illegal drugs in the urine. The most common method of drug detection is the immunoassay. This method is much more convenient research Similar assays can be used for research purposes to detect concentrations of potential clinical candidates such as antifungal and asthma drugs. Obviously, this technique is also useful for observing multiple species in collected samples, but standard solutions should be used when looking for information on species identity.

Medicine:

The medical uses of HPLC can include drug analysis, but it is closer to the category of nutrient analysis. Urine is the most common medium for analyzing drug concentrations, but serum is collected using HPLC in most medical analyzes..