An Introduction To Hplc For Pharmaceutical Analysis

Laboratory robotics

has been applied is structure determination in pharmaceutical research. Processes such as NMR and HPLC-MS can now have sample preparation done by robotic

Laboratory robotics is the act of using robots in biology, chemistry or engineering labs. For example, pharmaceutical companies employ robots to move biological or chemical samples around to synthesize novel chemical entities or to test pharmaceutical value of existing chemical matter. Advanced laboratory robotics can be used to completely automate the process of science, as in the Robot Scientist project.

Atmospheric-pressure chemical ionization

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Atmospheric pressure chemical ionization (APCI) is an ionization method used in mass spectrometry which utilizes gas-phase ion-molecule reactions at atmospheric pressure (105 Pa), commonly coupled with high-performance liquid chromatography (HPLC). APCI is a soft ionization method similar to chemical ionization where primary ions are produced on a solvent spray. The main usage of APCI is for polar and relatively less polar thermally stable compounds with molecular weight less than 1500 Da. The application of APCI with HPLC has gained a large popularity in trace analysis detection such as steroids, pesticides and also in pharmacology for drug metabolites.

Typically microfluidic systems transport, mix, separate, or otherwise process fluids. Various applications rely on passive fluid control using capillary forces, in the form of capillary...

Monolithic HPLC column

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A monolithic HPLC column, or monolithic column, is a column used in high-performance liquid chromatography (HPLC). The internal structure of the monolithic column is created in such a way that many channels form inside the column. The material inside the column which separates the channels can be porous and functionalized. In contrast, most HPLC configurations use particulate packed columns; in these configurations, tiny beads of an inert substance, typically a modified silica, are used inside the column. Monolithic columns can be broken down into two categories, silica-based and polymer-based monoliths. Silica-based monoliths are known for their efficiency in separating smaller molecules while, polymer-based are known for separating large protein molecules.

Each component in the sample interacts differently with the adsorbent material, causing different migration...

Micellar electrokinetic chromatography

chromatography (HPLC), can be used to identify the purity of a combinatorial library, but assays need to be rapid with good resolution for all components to provide

Micellar electrokinetic chromatography (MEKC) is a chromatography technique used in analytical chemistry. It is a modification of capillary electrophoresis (CE), extending its functionality to neutral analytes, where the samples are separated by differential partitioning between micelles (pseudo-stationary phase) and a surrounding aqueous buffer solution (mobile phase).

Laboratory processes are suited for robotic automation as the processes are composed of repetitive movements (e.g., pick/place, liquid/solid additions, heating/cooling, mixing, shaking, and testing). Many laboratory robots are commonly referred as autosamplers, as their main task is to provide continuous samples for analytical devices.

Cannabigerovarin

"HPLC–UV–HRMS analysis of cannabigerovarin and cannabigerobutol, the two impurities of cannabigerol extracted from hemp". Journal of Pharmaceutical and

Cannabigerovarin (CBGV), the propyl homolog of cannabigerol (CBG), is a cannabinoid present in Cannabis. There is no observation related to the psychoactive or psychotropic effects of CBGV when consumed or inhaled.

Microfluidics

is an important feature because different applications of HPLC microfluidic chips may call for different pressures. PDMS fails in comparison for high-pressure

Microfluidics refers to a system that manipulates a small amount of fluids (10?9 to 10?18 liters) using small channels with sizes of ten to hundreds of micrometres. It is a multidisciplinary field that involves molecular analysis, molecular biology, and microelectronics. It has practical applications in the design of systems that process low volumes of fluids to achieve multiplexing, automation, and high-throughput screening. Microfluidics emerged in the beginning of the 1980s and is used in the development of inkjet printheads, DNA chips, lab-on-a-chip technology, micro-propulsion, and micro-thermal technologies.

The basic set-up and detection methods used for MEKC are the same as those used in CE. The difference is that the solution contains a surfactant at a concentration that is greater than the critical micelle concentration (CMC). Above this concentration, surfactant monomers are in equilibrium with micelles.

Direct electron ionization liquid chromatography–mass spectrometry interface

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A direct electron ionization liquid chromatography–mass spectrometry interface (Direct-EI LC-MS interface) is a technique for coupling liquid chromatography and mass spectrometry (LC-MS) based on the direct introduction of the liquid effluent into an electron ionization (EI) source. Library searchable mass spectra are generated. Gas-phase EI has many applications for the detection of HPLC amenable compounds showing minimal adverse matrix effects. The direct-EI LC-MS interface provides access to well-characterized electron ionization data for a variety of LC applications and readily interpretable spectra from electronic libraries for environmental, food safety, pharmaceutical, biomedical, and other applications.

Liquid chromatography–mass spectrometry

is an analytical chemistry technique that combines the physical separation capabilities of liquid chromatography (or HPLC) with the mass analysis capabilities

Liquid chromatography–mass spectrometry (LC–MS) is an analytical chemistry technique that combines the physical separation capabilities of liquid chromatography (or HPLC) with the mass analysis capabilities of mass spectrometry (MS). Coupled chromatography – MS systems are popular in chemical analysis because the individual capabilities of each technique are enhanced synergistically. While liquid chromatography separates mixtures with multiple components, mass spectrometry provides spectral information that may help to identify (or confirm the suspected identity of) each separated component. MS is not only sensitive, but provides selective detection, relieving the need for complete chromatographic separation. LC–MS is also appropriate for metabolomics because of its good coverage of a wide...

In most applications, MEKC is performed in open capillaries under alkaline conditions to generate a strong electroosmotic...

High-performance liquid chromatography

having area proportional to its amount. HPLC is widely used for manufacturing (e.g., during the production process of pharmaceutical and biological products)

High-performance liquid chromatography (HPLC), formerly referred to as high-pressure liquid chromatography, is a technique in analytical chemistry used to separate, identify, and quantify specific components in mixtures. The mixtures can originate from food, chemicals, pharmaceuticals, biological, environmental and agriculture, etc., which have been dissolved into liquid solutions.

It relies on high pressure pumps, which deliver mixtures of various solvents, called the mobile phase, which flows through the system, collecting the sample mixture on the way, delivering it into a cylinder, called the column, filled with solid particles, made of adsorbent material, called the stationary phase.

Custom peptide synthesis

more difficult to synthesize longer peptides at a high quality. The synthesised peptides must undergo a QC procedure by analytical HPLC and mass spectrometry

Custom peptide synthesis is the commercial production of peptides for use in biochemistry, biology, biotechnology, pharmacology and molecular medicine. Custom peptide synthesis provides synthetic peptides as valuable tools to biomedical laboratories. Synthetic oligopeptides are used extensively in research for structure-function analysis (for example to study protein-protein interfaces), for the development of binding assays, the study of receptor agonist/antagonists or as immunogens for the production of specific antibodies. Generally, peptides are synthesized by coupling the carboxyl group or C-terminus of one amino acid to the amino group or N-terminus of another using automated solid phase peptide synthesis chemistries. However, liquid phase synthesis may also be used for specific needs...

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