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Spectrometry, chromatography and separation techniques

Mahwish Raza
Iran

Mass spectrometry is a technique which involves measurements of mass to charge ratios of the ions formed when a sample is ionized. Chromatography is a technique for the separation of a mixture is dissolved in a fluid called the mobile phase which carries through a structure holding another material called the stationary phase. The technique is column chromatography, planer chromatography (paper and thin layer chromatography). Techniques by the physical state of mobile phase are gas and liquid chromatography. Techniques by separation mechanism is ion exchange chromatography, size exclusion and expanded bed adsorption chromatographic separation. Special techniques are a reverse phase and two-dimensional chromatography. The samples are subjected to flow by mobile liquid onto or through the stable stationary phase. A mass spectrometer generates multiple ions from the sample under investigation; it then separates them according to their specific mass-to-charge ratio (m/z), and then records the relative abundance of each ion type. The mass spectrometer is used to solve analytical problems in biotechnology, environmental studies, polymer chemistry, forensic and inorganic applications. Chromatography is applied in the chemical industry in a testing water sample and also checks air quality by HPLC and GC. It is also used in forensic science, molecular biology studies in food industries. The other applications of chromatography HPLC are used in protein separation like insulin purification, plasma fractionation, and enzyme purification. Mass spectrometry has become a powerful tool for the analysis of a large number of proteins in complex samples. Chromatography is accepted as an extremely sensitive and effective separation method. Column chromatography is one of the useful separation and determination methods. A qualitative screening procedure was developed for the detection of the hydrolysis and related products of chemical warfare agents using liquid chromatography-mass spectrometry with atmospheric pressure chemical ionization. A mixed C8/C18 reversed-phase column gave acceptable chromatography for the range of acidic, neutral and basic analytes.

mahwishraza112@gmail.com