

On-Line Super Critical Fluid Extraction, Supercritical Fluid Chromatography, Mass Spectrometry, a Technique in Pharmaceutical Analysis

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Abstract : The literature is reviewed with regard to online Super critical fluid extraction (SFE) coupled directly with supercritical fluid chromatography (SFC) -mass spectrometry that have typically more sensitive than conventional LC-MS/MS and GC-MS/MS. It is becoming increasingly interesting to use on-line techniques that combine sample preparation, separation and detection in one analytical set up. This provides less human intervention, uses small amount of sample and organic solvent and yields enhanced analyte enrichment in a shorter time. The sample extraction is performed under light shielding and anaerobic conditions, preventing the degradation of thermo labile analytes. It may be able to analyze compounds over a wide polarity range as SFC generally uses carbon dioxide which was collected as a by-product of other chemical reactions or is collected from the atmosphere as it contributes no new chemicals to the environment. The diffusion of solutes in supercritical fluids is about ten times greater than that in liquids and about three times less than in gases which results in a decrease in resistance to mass transfer in the column and allows for fast high resolution separations. The drawback of SFC when using carbon dioxide as mobile phase is that the direct introduction of water samples poses a series of problems, water must therefore be eliminated before it reaches the analytical column. Hundreds of compounds analysed simultaneously by simple enclosing in an extraction vessel. This is mainly applicable for pharmaceutical industry where it can analyse fatty acids and phospholipids that have many analogues as their UV spectrum is very similar, trace additives in polymers, cleaning validation can be conducted by putting swab sample in an extraction vessel, analysing hundreds of pesticides with good resolution.

Keywords : super critical fluid extraction (SFE), super critical fluid chromatography (SFC), LCMS/MS, GCMS/MS

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