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New Analytical Strategies for Sorption-Based Methods

A sample preparation is needed in many sample matrices to perform the analyses. This preparation takes around 80% of the time of analysis. Solid phase extraction in particular is the equilibrium technique of enrichment used in some environmental matrices, but this usually needs large sample volume. There are employed static equilibrium techniques like the solid phase micro-extraction (SPME) and the stir bar sorptive extraction (SBSE), which have played a very important role to improve selectivity and sensitivity. But this techniques has limitations like it allow low capacity, only indicated for GC analysis, etc, which are related to the extraction back modes (thermal desorption and liquid desorption). To approach this, recently it has been introduced the adsorptive micro-extraction techniques (Baμe) which are novel analytical approaches indicated to monitor trace levels of polar compounds in aqueous matrices. The sorption- based technique has the advantage of: equilibrium process is faster, it is necessary low sample, more robust and allows the reuse.

The device is a sorbent phase like of activated carbons on a supporting bar. The Baμe-LD (liquid desorption) is a potential technique because it can be used for HPLC or GC and in the optimization it has been shown that the recoveries of traces are elevate. This method has been employed in disinfected water matrices, triazines, PPCPs. In conclusion the Baμe reduce the size of device, uses less desorption solvent volume.

Comprehensive Two-Dimensional Liquid Chromatography as a Powerful Tool for Food Applications

LC techniques are characterized by a variety of separation mechanisms with different selectivities. This technique allows have a higher number of theoretically achievable orthogonal MDLC combinations. Some difficulties in LC are the presence of a mobile phase immiscible, 1D mobile phase 2D stationary phase incompatibility when it is done the combination of LC types. Multidimensional techniques are usually used in the pre-tratement of complex matrices. This technique consist in the collection of primary column fractions and their successive re-injection into a secondary column. Although this method present some disadvantages: long time of analysis, it is difficult to automate, exist the possibility of sample contamination, artefact formation is high and analytical reproducibility is low.

The connection between the two columns is done by means of a high pressure switching valve which entraps a specific quantity of 1D eluent, usually in a loop, and directs it into the 2D column. The second pump force the loop material into a second column where the analysis is run consequently without the use of stopped flow methods. Usually the 1D column has a low flow rate and the second employs a higher flow. When this two dimensions are coupled to a MS, this detector gives a third dimension for the analysis. Some example samples for employ this technique are: polyphenols in sugarcane, polyphenols in red wine, triacylglycerols in borage oil. In this experiences usually is used a reverse phase for the 2D like in the last example.

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