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Integrating extraction and stirring in microextraction techniques

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The performance of a given microextraction technique depends on both thermodynamic and kinetic factors. In fact, thermodynamics defines the total amount of analyte that can be isolated while kinetics describes the time required to achieve the mass transference equilibrium. Therefore both aspects, which in some cases may be opposite forces, have to be studied in depth and they have being the focus of an intensive research in the last decades. Agitation is usually found in the scientific literature as a kinetic variable of paramount importance in microextraction techniques since it facilitates the diffusion and therefore the transference, of the analytes from the bulk sample to the solid/liquid phase that acts as extractant. Sample agitation is common to the majority of the microextraction techniques although it can be performed in two different ways. In the simplest approach, the agitation is done by an external element (typically a magnetic bar). Although this strategy has been successfully applied in many well established techniques like solid phase microextraction (SPME) may have two shortcomings, namely the higher turbulence is produced far from the sample/extractant interface and the magnetic bar, especially if it is coated with a polymer, may co-extract a part of the analyte. These shortcomings may be overcome if a second approach, where the agitation element and the extractant phases are integrated in the same device, is applied. This simple idea, which was firstly proposed by Prof. Sandra in the so-called stir bar sorptive extraction, has been exploited in different formats in the last years. This communication tries to give a general overview of the contributions of our research group in this context. The main microextraction techniques developed in our laboratories, including the so-called stir membrane extraction, will be discussed in depth presenting the main research lines for the next years.

Biography

Rafael Lucena Rodriguez is a Professor at the Analytical Chemistry Department of the University of Cordoba since 2010. He has coauthored 80 scientific articles and several chapters mainly on microextraction techniques. He has been Guest Editor in one special issue of *Analytical and Bioanalytical Chemistry* journal. He is the Editor of Microextraction Tech blog. His main research interest comprises different areas, especially the development of new microextraction techniques as well as the evaluation of ionic liquids and nanoparticles in this context. Currently he is also working on bio-recognition.

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