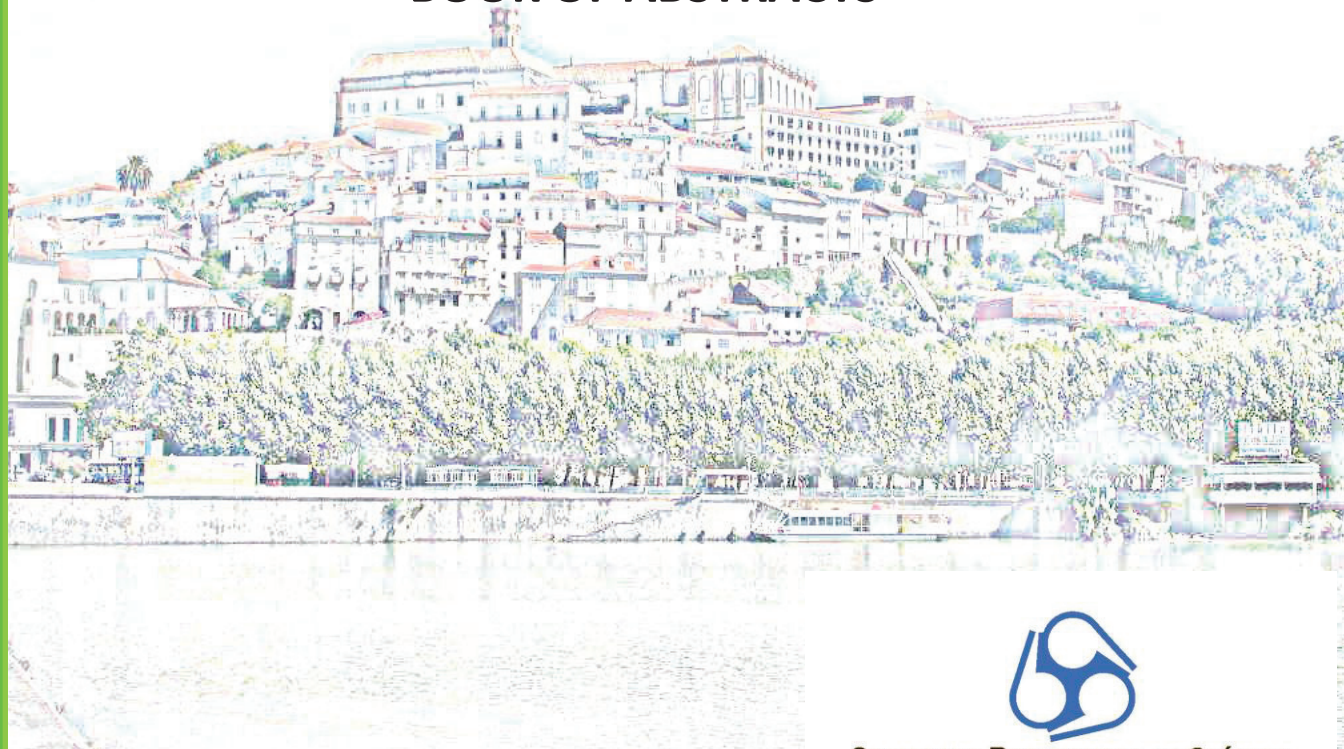


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SOCIEDADE PORTUGUESA DE QUÍMICA

IL-03 SOLID PHASE EXTRACTION IN FLOW ANALYSIS PLATFORMS

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The analysis of complex matrices like food and environmental samples pose a number of challenges in terms of selectivity, limit of detection and even analyte speciation. In this scenario, novel methods are demanded that might provide analyte enrichment and minimisation of interferences. Additionally, a focus on devising greener chemistries and minimisation of sample and reagents consumption is also envisaged.

The use of solid phase extraction (SPE) to reach the above-mentioned objectives has gained increased importance due to some advantageous features like avoiding the use of organic solvents. However, its operation in the usual batch manual way may lead to some lack of reproducibility, being the quality of results usually dependent on the operator skill.

One way to overcome these difficulties is the implementation of SPE in flow analysis systems. Different approaches have been described, either using the solid material in the reusable mode, in packed columns, or in a renewable and disposable mode, using the so-called bead injection approach. The first one allows saving solid sorbent but is often prone to saturation, contamination, and overpressure build-up. The renewable mode overcomes these limitations and allows to carry out chemistries and detection on the solid material itself, namely in the so-called solid phase spectrometry mode. When coupled to miniaturized detectors, the overall analytical process may be configured in portable systems.

In this paper, some alternative flow configurations for this purpose are presented and discussed in terms of applicability, selectivity, sensitivity, and reagent consumption. Some selected applications developed in our group to tackle different challenges in food and environmental analysis are presented.

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