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Applications of solid phase extraction and functionalized sorbent materials in flow analysis

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Wet chemistry sample preparation before instrumental analysis is often the limiting step in analytical processes. To overcome some of these limitations, solid phase extraction approaches have gained particular relevance in the last few years due to its inherent capability to both improve selectivity and sometimes sensitivity of the method, minimize solutions handling and avoiding to use organic solvents. When these processes are carried in flow analysis, precision can be improved and the amount of sorbent materials can be reduced. However, handling solid materials in flow analysis systems, either in packed-bed columns, or disposable modes in each cycle, is not straightforward. Actually, back pressure problems, saturation and/or contamination of the sorbent, limited capacity of the small amount of sorbent material, opacity properties of the materials in solid phase spectrometry mode, analyte dilution during elution, are limitations often pointed out. Some of these limitations can be overcome by producing tailor-made sorbents/reagents for some specific application, which also arise other associated problems. In this paper, some contributions on flow analysis systems involving the above-mentioned approaches, and its applicability to environmental and food analysis, will be discussed.

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