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A view on the strengths and limitations of flow-based approaches for food and environmental monitoring

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Monitoring food and environmental samples and associated dynamic systems pose a number of significant analytical challenges: frequent need for analyte enrichment; minimization of interferences; need for efficient sampling procedures; cope with a wide range of analyte concentrations; achieve speciation of different forms of the analyte; search for greener chemistries; reducing sample consumption without compromising representativeness of the target material.

To tackle the above-mentioned challenges, the use of in-line separation processes like membrane separation processes, solid phase extraction (reusable or renewable modes), and low pressure chromatography have emerged as powerful tools to increase the selectivity and sensitivity of flow-based methods, and yet maintaining the major advantages of its use, namely the relative simplicity, low cost, and good reproducibility.

In this scenario, some contributions of the group on this line of work will be presented. Examples of the approaches used to deal with the complexity of measurements in food samples like wine and coffee, and environmental samples like soil leachates, freshwaters, estuarine and coastal waters, will be discussed.

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