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Future of bioanalytical chemistry: the potential role of miniaturized separation techniques & sustainability

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Thematic Area: Green analytical chemistry: innovative solutions towards development of sustainable technologies

Abstract

Nowadays, there is an increasing focus on reducing the impact of human activities on the environment, together with greater protection of human health. In this area, much has been done in chemistry and analytical chemistry, especially through the development of the principles of Green Chemistry (GC) and Green Analytical Chemistry (GAC). Recently, also in terms of sample preparation, the most important and "problematic" step in the analytical field, we have witnessed the enunciation of the principles of Green Sample Preparation (GSP). These principles, which represent a milestone in the development of new procedures and devices, allow us to evaluate and review chemical activities (at all levels) and to review them in order to reduce the effects on the environment and on health.
Today, several tools are available that, following these principles, allow both a standardized and visual assessment of the impact. An essential element in this field is represented by the miniaturization of techniques and separation procedures, which simultaneously allow to maintain high sensitivity of the analysis, as well as to reduce the amount of sample required, the production of waste and the consumption of solvents. In this invited presentation, I would like to present the state of the art in GC, GAC and GSP and related instruments precisely in relation to this aspect and we will see together what future perspectives await us in this increasingly important field of research.

Keywords: miniaturization, separation techniques, GAC, GC, GSP, tools.