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TOPIC(s) : Life cycle and environmental assessment / Alternative solvents

## Implementing green into analytical daily work

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### PURPOSE OF THE ABSTRACT

Green Analytical Chemistry has been introduced in the early 90's [1] and its main principles have been inspired by the 12 principles of its parent, Green Chemistry [2].

To deal with environmental fate, analytical chemistry has been a dynamic part of green chemistry : considerable work has been carried out to miniaturize, automate and communicate around sample preparation techniques in laboratories. Nowadays, SPME (Solid Phase Microextraction), SBSE (Stir Bar Sorptive Extraction) are among the extraction techniques which are largely spread in analytical labs to limit solvent use and allow in situ extractions. Analytical instruments suppliers provide also solutions to limit electrical/gas consumption. Alternatively, many papers have described tools to help analytical scientists to evaluate their ecological impact (NEMI [3], Analytical Eco Scale [4], HPLC-EAT [5] or more recently GAPI [6] ). Those tools offer more or less reliable quantitative evaluations though different criteria based on sample preparation/instrumentation/solvents and reagents and sampling.

If solutions exist and are well described, there is a large gap between everyday practices in laboratories and environment-friendly practices. Environmental impact is rarely included in the analytical development and choice of the sample preparation/analytical method is preferably oriented on easy to implement existing solutions. Furthermore, if tools to calculate environmental impact are well described, they are not easy to handle, even for an experienced user. Some criteria remain insufficiently exploited and the metrics applied to quantitation may sometimes seem questionable, even arbitrary...

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[5] Y. Gaber, U. Törnvall, M.A. Kumar, M. Ali Amin, R. Hatti-Kaul, HPLC-EAT (Environmental Assessment Tool), A tool for profiling safety, health and environmental impacts of liquid chromatography methods. Green Chem. 2011, 13, 2021-2025.

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## FIGURES

FIGURE 1

FIGURE 2

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### KEYWORDS

Green analytical chemistry | Sustainability | Greenness assessment | Alternative solvents

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### BIBLIOGRAPHY

Impossible to fill this section, each time I add more than one publication, everything is getting erased and bibliography does not appear on the preview... I put the bibliography into the abstract section.