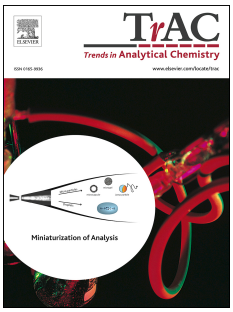
Accepted Manuscript



"Green" nature of the process of derivatization in analytical sample preparation

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PII: S0165-9936(17)30488-0

DOI: 10.1016/j.trac.2018.01.005

Reference: TRAC 15089

To appear in: *Trends in Analytical Chemistry*

Received Date: 18 December 2017

Revised Date: 19 January 2018

Accepted Date: 19 January 2018

Please cite this article as: M. Sajid, J. Płotka-Wasylka, "Green" nature of the process of derivatization in analytical sample preparation, *Trends in Analytical Chemistry* (2018), doi: 10.1016/j.trac.2018.01.005.

"Green" nature of the process of derivatization in analytical sample preparation

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Abstract

Nowadays, Green Analytical Chemistry idea is of high importance what impact on the rapid growth in the sample preparation area with special emphasis on sample preparation simplification, miniaturization and automation. Because the derivatization process is often an essential element of the analytical procedure, it should be important to focus on this issue and conduct a series of experiments in order to develop the most favourable conditions. Application of microextraction techniques coupled with the derivatization perfectly meets the specified requirements. Other approaches to perform derivatization process in "green" way include application of eco-friendly solvents/reagents, enhanced parameters such as microwaves or ultrasound and application of in-port, on-column/in-capillary derivatization modes. This review describes factors that allow making derivatization process more green, different modes and ways of derivatization procedures involving less toxic, hazardous reagents/solvents and more efficient forms of energy. Moreover, microextraction techniques that are often coupled to derivatization are described with examples.

Keywords

Green analytical chemistry; derivatization; ionic liquids; supercritical fluids; ultrasounds; microwaves; microextraction techniques

1. Introduction

The low amounts of analytes present in different kinds of samples, the sample characterized by complex matrix composition, and the need for several isolation steps makes accurate quantification difficult. Thus, it is necessary to select an appropriate method of sample preparation for analysis including choice of extraction type, and a final determination technique. In addition, the fact that many compounds do not possess structural properties which enable determination by means of gas (GC) or liquid chromatography (LC). Therefore, derivatization process (chemical conversion of analytes) is often performed because it allows for a significant increase in the possibilities and scope of application of both techniques. For example, application of derivatization impact on decreasing of polarity and reactivity and increase volatility of the target compounds which is desirable in the case of GC analysis.