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PII: S0039-9140(14)00415-9
DOI: http://dx.doi.org/10.1016/j.talanta.2014.05.031
Reference: TAL14791

To appear in: *Talanta*

Received date: 25 February 2014
Revised date: 13 May 2014
Accepted date: 18 May 2014

Cite this article as: Salvatore Barreca, Santino Orecchio, Andrea Pace, Photochemical sample treatment: a greener approach to chlorobenzene determination in sediments, *Talanta,* http://dx.doi.org/10.1016/j.talanta.2014.05.031

Photochemical sample treatment: a greener approach to chlorobenzene determination in sediments

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Keywords

Chlorobenzene, Photochemical sample treatment, Sediment analysis, Clean up, UV irradiation

Abstract

Due to worker's exposure, solvent and stationary phase's consumption, sample purification is one of the most polluting steps in analytical procedures for determination of organic pollutants in real samples. The use of photochemical sample treatment represents a valid alternative methodology for extracts clean up allowing for a reduction of the used amount of organic solvents.

In this paper we report the first application about the photolytic destruction of organic substances to eliminate some of the interferences in the analysis of Chlorobenzenes in sediment samples.

The method's efficiency and robustness were compared with classic silica column purification process currently used in clean up procedures in sediment analysis. Quality parameters such as recovery, linearity and reproducibility were studied. The entire procedure was validated by three replicate analysis of spiked real sediment sample. The quantification limits (LOQ) obtained by us ranged from 1.0 to 2.3 ng g^{-1}, while the detection limits (LOD) were of 1.0 ng g^{-1}.

The RSD for each congener was below 10% and recoveries were in the range 95–130%.