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Headspace microextraction in packed sorbent coupled to cooling device as a new extraction technique for the HPLC determination of PAHs in soil samples

Payman Hashemi and Fariba Nazari Serenjeh

Lorestan University, Iran

A semi-automatic headspace microextraction in packed sorbent coupled to cooling device (HS-MEPS-CD) system was developed with the ability of heating the sample matrix and simultaneously cooling the extraction phase. Amino ethyl-functionalized SBA-15, a nanoporous sorbent, was used in the device for the extraction. The innovated technique was applied to the extraction and HPLC determination of polycyclic aromatic hydrocarbons (PAHs) in soil samples. The proposed device improves the efficiency of the release of analytes from the matrix, facilitates the mass transfer into the headspace and significantly increases the partition coefficients of the analytes. For the efficient extraction of PAHs by the HS-MEPS-CD system, several parameters that influence the performance of the technique, such as nature and amount of sorbent, eluent type, elution volume, extraction temperature and the number of draw-eject cycles were carefully studied. Under optimal experimental conditions, linear calibration curves were obtained with regression coefficients that ranged from 0.952 to 0.988 and detection limits from 0.0006 to 0.0037 µg/g. The method was successfully applied to the HPLC analysis of PAHs in soil samples.

Biography

Payman Hashemi has completed his PhD from Uppsala University, Sweden. He is a Professor of Analytical Chemistry in the Department of Chemistry, Lorestan University, Iran. He has published more than 70 papers in international journals.

hashemi.payman@gmail.com

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