

Powerful preconcentration method for ultra trace amounts of polycyclic aromatic hydrocarbons and its application to the environmental analysis

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Abstract:

A preconcentration procedure is one of the most important techniques for the environmental analysis. In this study, lower ppt levels of polycyclic aromatic hydrocarbons (PAHs) in environmental water can be determined by the proposed powerful preconcentration method with high performance liquid chromatography using fluorescence detection (FL/HPLC). The preconcentration method consists of the combination of the blue cotton method (solid-phase extraction) and the homogeneous liquid-liquid extraction. In the case of the homogeneous liquid-liquid extraction, PAHs in the eluate of solid-phase extraction were extracted into micro volume of sedimented phase. The proposed method could completely concentrate 1 liter to 20 microliter within one hour and the 20 microliter of sedimented phase is directly injected into FL/HPLC. The entire preconcentration factor was 50,000-fold. Six kinds of PAHs were determined in the range of $3.0 \times 10^{-18} \sim 4.5 \times 10^{-11}$ mol L⁻¹. These chemicals were also satisfactorily separated. By changing the combination of various preconcentration methods or instrumental analysis, the various samples would be analyzed.

