

Determination of carcinogenic naphthalene, anthracene, phenanthrene and fluorene in the Bangsai river water of Bangladesh by solid phase extraction and gas chromatograph-mass spectrometry

Abstract

A rapid and reproducible method is described that employs solid phase extraction (SPE) using dichloromethane, followed by gas chromatograph-mass spectrometry for the determination of environmentally carcinogenic naphthalene, anthracene, phenanthrene and fluorene (NAPF) from the Bangsai river water near the Dhaka mega city of Bangladesh. The method was applied to detect and quantify NAPF in water samples collected from surface and 30 cm depth of water. Fifty milliliters of methanol pretreated and filtered water samples were applied directly to a C 18 SPE column. NAPF were extracted with dichloromethane and the NAPF concentration obtained was between 0.39 and 54.98 ppm. The factors influencing SPE, e.g., absorbent types, sample load volume, eluting solvent and temperature were investigated. A cartridge containing a C 18 absorbent and using solvent gave a better performance for the extraction of NAPF from the Bangsai river water samples. Average recoveries exceeding 75% could be achieved for toluene at 25 °C with a 2.6% RSD.