

Gas chromatography-mass spectrometry determination of polycyclic aromatic hydrocarbons in water coupled with electro flotation-assisted emulsification liquid-liquid micro extraction

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Abstract

Polycyclic aromatic hydrocarbons are priority pollutants due to the very high toxicity. Therefore, to determine them, it is necessary to use sensitive methods with preconcentration. In the present study, a novel method named electroflotation-assisted deemulsification liquid-liquid microextraction combined with GC-MS analysis has been proposed for the preconcentration and determination of polycyclic aromatic hydrocarbons in water samples. The advantage of electroflotation deemulsification is the ease of changing the gas flow and size of gas micro-bubbles. The formation of gas micro-bubbles occurs on platinum electrodes soldered into a glass concentrator. Hexane, toluene and o-xylene were used as extractants. Application of extract capillary collection have solved the problem of the light extractant sampling. Dispersion of the extractant was performed by ultrasound. The volume of microextract was 7-10 μ l. The recovery of polycyclic aromatic hydrocarbons from water was 62-95%. A DB-5 (5% phenyl + 95% polydimethylsiloxane) fused-silica capillary column (30 m \times 0.25 mm i.d. and 0.25- μ m film thickness) was applied for separation of the analytes. The limits of detection and quantification of polycyclic aromatic hydrocarbons achieved were at the level of 10⁻⁵-10⁻⁶ mgL⁻¹ and highly competitive with the best world results. The methods of accounting or elimination of systematic errors are proposed. Purification of solvents by Rayleigh distillation method allows to obtain samples with impurity content lower than (1-4)·10⁻³ mgL⁻¹. Containers for sampling and storage of samples to be analyzed should be made of borosilicate glass or quartz. The expanded uncertainty was calculated. It included precision, uncertainty of standards preparation, calibration, sample introduction, enrichment factor. The relative expanded uncertainty was at the level of 13-30%.

new pathways for improving healthcare. She has built this model after years of experience in research, evaluation, teaching and administration both in hospital and education institutions. The foundation is based on fourth generation evaluation (Guba & Lincoln, 1989) which is a methodology that utilizes the previous generations of evaluation: measurement, description and judgment. It allows for value-pluralism.

Speaker Publications:

1. Harper C (2009) The neuropathology of alcohol-related brain damage. *Alcohol* 44:136-140.
2. Heilig M, Egli M (2006) Pharmacological treatment of alcohol dependence: Target symptoms and target mechanisms. *Pharmacology and therapeutics* 111:855-876.
3. Li X, Schwacha MG, Chaudry IH, Choudhry MA (2008) Acute alcohol intoxication potentiates neutrophil-mediated intestinal tissue damage after burn injury. *Shock* 29:377.
4. Sullivan EV, Zahr NM (2008) Neuroinflammation as a neurotoxic mechanism in alcoholism: Commentary on "Increased MCP-1 and microglia in various regions of human alcoholic brain". *Experimental neurology* 213:10-17.

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Biography:

Valentin has her expertise in evaluation and passion in improving the health and wellbeing. Her open and contextual evaluation model based on responsive constructivists creates