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## AC-O14

**Optimization of the Closed System, Microwave-Assisted Extraction of Polycyclic Aromatic Hydrocarbons from Sediments**

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**Objectives**

1. To investigate the optimum conditions for microwave-assisted extraction of PAHs from sediment samples
2. To compare efficiency of extraction between microwave extraction and Soxhlet extraction.

**Methods**

The spiked sediment containing benzo[*k*]fluoranthene, chrysene, acenaphthene, anthracene, carbazole and indeno[1,2,3-*c,d*]pyrene was used to investigate the optimum conditions of microwave extraction (type of extraction solvent, times of irradiation and temperatures of irradiation). Each PAHs was quantified by using the spectrofluorometric method. The microwave extraction efficiency of 14 PAHs in certified reference material, LGC 6188, was compared with Soxhlet extraction using dichloromethane as an extraction solvent. Recoveries of 14 PAHs were determined by HPLC-DAD at 254 nm using the standard addition method.

**Results**

The conditions for extracting PAHs from sediments by pressurized microwave-assisted extraction have been studied and optimized. Microwave-assisted extraction with 20 ml of cyclohexane:acetone (3:2) for 15 min at 140% boiling point of acetone provided the most efficient extraction. Under those conditions, the PAHs extraction recovery of PAHs in certified reference material was 96.55%, based upon the certified value. The reproducibility was satisfactory (%RSD less than 0.76% for the total amount of extracted PAHs).

**Conclusion**

The experimental results showed that pressurized microwave-assisted extraction in a closed-system provides a good alternative to Soxhlet extraction for the removal of PAHs from sediments. Its main advantages in comparison to the Soxhlet extraction are the reduction of the volume of volatile organic solvent, the reduction in extraction time, and the lower consumption of energy.

**Keywords:** microwave-assisted extraction, polycyclic aromatic hydrocarbons

**Selected References:**

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