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DISCHARGE WATERS: DETERMINATION OF POLYCYCLIC AROMATIC HYDROCARBON (PAH) LEVELS BY A GC-MS/MS METHOD

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Abstract

The aim of this work was to determine polycyclic aromatic hydrocarbon (PAH) levels in discharge waters from municipal and industrial treatment plants. For this purpose a simple and sensitive method for the analysis of 16 PAHs at ultra-trace levels in water has been developed and validated using liquid-liquid extraction (LLE) and gas chromatography-triple quadrupole mass spectrometry (GC-MS/MS). The total PAH content was in the range 100-800 ng L^{-1} for samples from surface treatment (ST) industries against 700-2000 ng L^{-1} for samples from municipal plants. Among PAHs, maximal values of 850 ng L^{-1} and 340 ng L^{-1} were obtained for phenanthrene in municipal and industrial discharge waters, respectively. Furthermore, the environmental quality standard of the Water Framework Directive expressed as maximal allowable concentrations in municipal treated waters was only overshot for benzo[g,h,i]perylene, a priority substance, and for fluoranthene, classified as a priority hazardous substance.

Key words: complex matrices, discharge water GC-MS/MS, liquid-liquid extraction (LLE), polycyclic aromatic hydrocarbons (PAHs)

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