ISSN 1063-455X, Journal of Water Chemistry and Technology, 2020, Vol. 42, No. 4, pp. 281–286. © Allerton Press, Inc., 2020.
Russian Text © The Author(s), 2020, published in Khimiya i Tekhnologiya Vody, 2020, Vol. 42, No. 4, pp. 381–389.

ANALYTICAL WATER CHEMISTRY

Quantitation of Polycyclic Aromatic Hydrocarbons and Organochlorine Pesticides in Surface Waters

N. Yu. Tereshchenko[a, b], O. I. Khyzhan[a, *], V. I. Maksin[a], and L. O. Kovshun[a]

[a] *National University of Life and Environmental Sciences of Ukraine, Kiev, Ukraine*
[b] *Bogomolets National Medical University, Kiev, Ukraine*
**e-mail: olenakhyzhan@gmail.com*

Received March 6, 2020; revised April 10, 2020; accepted June 2, 2020

Abstract—We develop an assay for the total content of xenobiotics from the polyaromatic hydrocarbon (PAH) and organochlorine pesticide (OCP) groups in samples of surface water containing suspended matter. It is found that the suspended matter isolated from water by filtration during sample preparation according to standard method ISO 5667:2006 may contain PAH and OCP xenobiotics. The xenobiotics containing in the filtrate and suspended matter isolated from water samples are extracted with *n*-hexane. After the extracts are concentrated by a factor of 250–1000, their qualitative and quantitative composition is determined by high-performance liquid phase chromatography with fluorescence detection and by gas chromatography mass spectrometry. For water samples, the limit of quantitation (LOQ) for OCP and PAH xenobiotics is found to be 0.1 and 0.005 μg/L, respectively, and in case of the suspended matter samples the LOQs are 0.1 and 0.005 ng/g. The determination error is expressed as the relative standard (mean-square) deviation S_r (%), and the completeness of xenobiotic extraction is expressed in per cents (r, %). The method is tested on samples of surface waters containing suspended matter in the range of 90 ± 10 to 2800 ± 50 mg/L. The developed method enables us to detect trace amounts of xenobiotics in water and in suspended matter in it. The method can be useful in studies of surface waters and in forecasting the level of contamination of aquatic environments with PAHs and OCPs released as a result of degradation of suspended matter that binds the xenobiotics.

Keywords: xenobiotics, suspended matter, polycyclic aromatic hydrocarbons, organochlorine pesticides, laboratory control, chromatography

DOI: 10.3103/S1063455X20040153