ENVIROCHEM2023

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HEMIJA I ZAŠTITA
ŽIVOTNE SREDINE

ENVIROCHEM2023

9th SYMPOSIUM
CHEMISTRY AND ENVIRONMENTAL PROTECTION

4-7. jun 2023. godine, KLADOVO, SRBIJA

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BOOK OF ABSTRACTS

9. simpozijum

Hemija i zaštita životne sredine

EnviroChem2023

sa međunarodnim učešćem

9th Symposium

Chemistry and Environmental Protection

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with international participation

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were frozen before analysis and measured after homogenization. The content of polychlorinated biphenyls is expressed as the amount of micrograms of PCB on wet fish in order to comply with the units (ng/g of wet weight) prescribed by the regulation. The presence of tested PCBs was not confirmed in the tested tuna samples.

Table 1. Basic validation data for selected polychlorinated biphenyl obtained by using GC/MS

Congener	Equation	R^2	LOQ, (µg/kg)	Recovery ± (RSD) % spike 10 µg/kg	Single to noise S/N (10 µg/kg)
PCB 28	y=1.7187x+8.1233	0.9968	2.8	112.5 ± (12.8)	181.4
PCB 52	y=0.9286x-1.0346	0.9999	3.6	118.9 ± (14.1)	90.7
PCB 101	y=1.0429x-5.2194	0.9988	2.5	98.2 ± (11.6)	88.6
PCB 153	y=0.6871x+14.507	0.9984	3.8	97.7 ± (9.7)	98.1
PCB 138	y=0.7099x-2.3009	0.9981	3.6	108.9 ± (16.8)	51.6
PCB 180	y=0.5010x+3.2130	0.9974	3.5	119 ± (14.2)	52.6

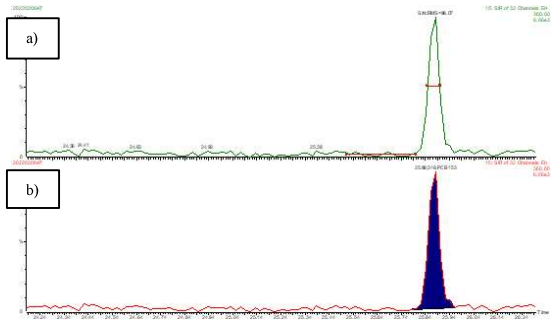

Figure 1. Chromatograms of PCB 153 in SIM mode. Spiked blank tuna fish sample after addition of 10 µg/kg standard of congener, extraction and clean-up. a) Estimation of ratio single to noise (S/N) b) Peak area

The validated method can also be applied to routine analysis and monitoring of processed tuna fish products on the Serbian market and improve food safety.

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Organic acids as solvents for leaching PAHs out of impregnated wood

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Polycyclic aromatic hydrocarbons (PAHs) are a group of hydrophobic organic compounds, which are ubiquitous in the environment. Some of them exhibit toxicity, mutagenicity, and carcinogenicity [1]. There is a high PAH content in creosote impregnated wood [2].

Creosote impregnated wood which was used and discarded becomes hazardous waste. Concentration of PAHs in used impregnated wood can be reduced by leaching with suitable solvent systems. Thus, the aim of this study was to compare different organic acids solvent systems for leaching PAHs out of impregnated wood to obtain non-hazardous waste. Leaching tests on impregnated wood were performed with 15 % water solution of urea, concentrated formic acid, 15 % solution of urea in formic acid and glacial acetic acid [3]. Concentration of PAHs in extracts was measured by GC-FID technique. Polycyclic aromatic hydrocarbons that were determined are naphthalene, 1-methylnaphthalene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo[a] anthracene and chrysene.

Table 1. Relative concentration of PAHs in four different extracts from creosote impregnated wood.

Relative concentration	15 % water solution of urea	Concentrated formic acid	15 % solution of urea in formic acid	Glacial acetic acid
naphthalene	0.09	0.45	0.55	1
1-methylnaphthalene	0.05	0.68	0.68	1
acenaphthene	0.01	0.65	0.67	1
fluorene	0.01	0.59	0.61	1
phenanthrene	0.003	0.59	0.59	1
anthracene	0.005	0.43	0.45	1
fluoranthene	0.001	0.56	0.57	1
pyrene	0.002	0.59	0.57	1
benzo[a] anthracene	n.d.	0.50	0.50	1
chrysene	n.d.	0.64	0.57	1

n.d.- Not detected

Data presented in Table 1. show that water solution of urea had the lowest extraction ability according to PAHs among tested solvent systems. Concentrated formic acid and solution of urea in concentrated formic acid indicated similar extraction ability according to

PAHs which was higher than previous. Glacial acetic acid showed the highest extraction ability according to PAHs among all solvent systems.

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