

EMEC 22

22nd European Meeting on
Environmental Chemistry

BOOK of ABSTRACTS

5 – 8 December, 2022,
Ljubljana, Slovenia



Univerza v Ljubljani
Zdravstvena fakulteta



ASSOCIATION OF
CHEMISTRY AND THE
ENVIRONMENT





University of Ljubljana
Faculty of Health Sciences



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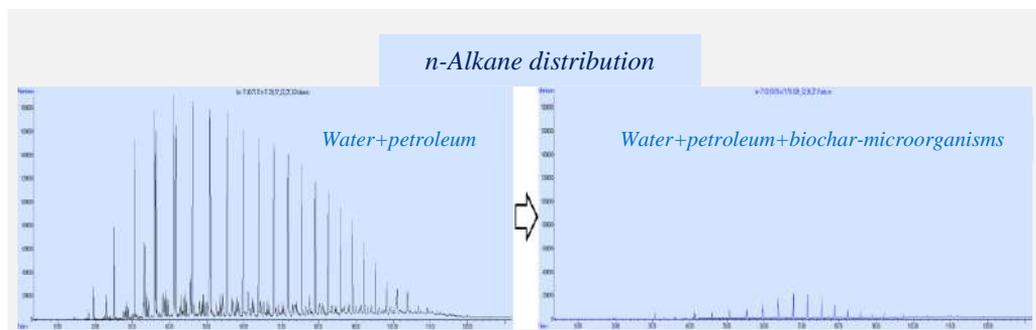
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Sorption and Biosorption of Petroleum Pollutants from Water Samples Using Biochar, Hydrocarbon Degrading Microorganisms and Their Combination

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Petroleum pollutants and organic waste are both important environmental issues. Biochar is a highly complex and heterogeneous material consisting of both organic and inorganic compounds obtained by thermal degradation of organic wastes [1, 2]. Using biochar for removal of petroleum pollutants could decrease the environmental impact of both petroleum pollutants and organic waste. Furthermore, immobilising microorganisms on biochar could increase removal through the effect of biosorption and eventually biodegradation.

The aim of this research was to examine the efficiency of removal of petroleum hydrocarbons using biochar, microbial consortium and their combination. Microorganisms were isolated from soil polluted with hydrocarbons and enriched on media supplemented with diesel, while two biochar samples (made from wheat straw pellets and sewage sludge) were used as adsorbers and carriers for immobilization of these hydrocarbon degrading microorganisms.

The remediation study was performed on water samples prepared in laboratory condition by adding crude oil and minerals into the distilled water. The period of the remediation was 96 days, while the analysis of the removal and degradation of petroleum pollutants was performed every 32 days for each sample.

Measurement of the removal of total petroleum pollutants was followed gravimetrically measuring fraction of extracted soluble organic matter, separated saturated and aromatic fractions of crude oil that remained in water phase. Furthermore, saturated and aromatic fractions were analysed by

GC-MS. From the obtained results it can be seen that more than 99% of crude oil was removed from numerous water samples and that microorganisms primarily degrade *n*-alkanes over other groups of compounds.

In further studies, if method effectiveness proven successful, should be tested on real samples and it should be scaled up for industrial purposes.

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