

THE USE OF BIOTESTS IN ESTIMATION OF WEATHERED DRILLING WASTE BIOREMEDIATION

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Abstract: Petroleum products are complex mixture of compounds of varied biological properties. They can cause harmful changes in contaminated ecosystems and threaten humans and living organisms as well. Bioremediation (including bioremediation stimulated by biogenic substances and inoculation with biopreparations from autochthonous bacteria and fungi) can result in creation of metabolites of a varied structure and biological activeness, which has been partly recognised. Some of them are more toxic than an initial substrate. Besides, they might have mutagenic features and be responsible for cancer. Estimation of bioremediation effectiveness in waste pits was completed with toxicological monitoring. It was led with the use of living organisms as biomarkers representing all trophic levels of a chosen ecosystem: producers, consumers and reducers. This process enables total estimation of natural environment conditions. The aim of the research was to determine the influence of petroleum contaminants and indirect metabolites (produced during bioremediation) on soil biocenose. The results of biotests (toxicity, phytotoxicity and genotoxicity) have been taken into account. The following biotests, prepared and produced by Microbiotest, have been applied: Phytotoxkit™, Ostracodtoxkit F™, acute toxicity tests Microtox® Solid Phase and Ames mutagenicity tests. The obtained results enabled observation of changes in toxic properties during purification of the soil taken from waste pits. In addition, it can be claimed whether the areas are suitable for forest usage.