

STUDY OF BIODEGRADABILITY OF METHYL- AND HYDROXYPHENOLS BY ACTIVATED SLUDGE

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The aim of this study was to investigate aerobic biodegradability of phenolic compounds characteristic of oil shale industry wastewaters by the activated sludge from the Kohtla-Järve wastewater treatment plant. For this purpose, the measurements of short-term oxygen uptake and biochemical oxygen demand were carried out for phenol, p-cresol, o-cresol, resorcinol, 5-methylresorcinol and 3,4-, 3,5-, 2,4- and 2,6-dimethylphenol as single substrates. The results obtained show that the microbial community of activated sludge was capable of oxidizing phenol, p-cresol, resorcinol and 5-methylresorcinol, the best-degrading dimethylphenol being 3,4-dimethylphenol. 3,5-, 2,4- and 2,6-dimethylphenol did not degrade during the short-term measurements; however, a long-term degradation of dimethylphenols was observed in the tests. The biodegradation of the studied compounds was also characterized by the kinetic parameters such as values of the maximum rate of oxygen uptake $V_{O_2, \max}$, the maximum rate of substrate bio-oxidation V_{\max} and half-saturation constants K_S . Variations in the measured parameters during the 2-year period of the study are discussed.