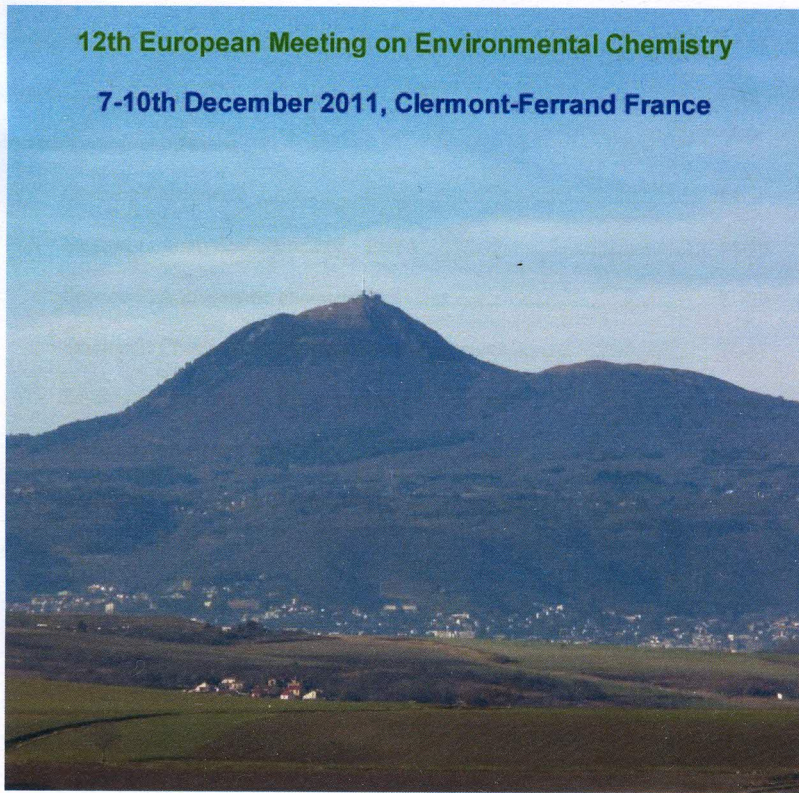


EMEO12

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THE INFLUENCE OF BIOREMEDIATION CONDITIONS ON THE DEGRADATION OF PHENANTHRENE AND ITS METHYL ISOMERS IN PETROLEUM-TYPE POLLUTANTS

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In this paper, the changes in the distribution of phenanthrene and its methyl-, dimethyl- and trimethyl-isomers during bioremediation of soils contaminated with petroleum type pollutants under different conditions were investigated. Firstly, the laboratory experiment of the simulated oil biodegradation with aerobic zymogenous microorganisms in soil (Danube alluvium, Pančevo, Serbia) was conducted (75 days period). The changes in the distribution of phenanthrenes were investigated also during *ex situ* bioremediation of soils (6 months period). On the one hand, experiments were conducted in which biodegradation was stimulated (re-inoculation, biostimulation, the addition of sawdust and biosurfactants). On the other hand, experiments were conducted in which bioremediation was not stimulated. A considerably high bioremediation potential was confirmed in the biodegradation of phenanthrene and methyl phenanthrenes with aerobic zymogenous microorganisms. During the process of *ex situ* "natural" microbial degradation similar trend was observed: the relative concentration of phenanthrene is reduced relative to methyl-, dimethyl- and especially relative to trimethyl-phenanthrenes. However, during the process of "stimulated biodegradation" a different sequence was observed: there was a uniform increase in the relative abundance of phenanthrene compared to its methyl isomers. Results obtained from these studies indicate that biodegradation of phenanthrene and its methyl isomers is not unambiguous and that largely depends on the conditions under which the degradation takes place.