Simularea transportului şi comportării unor poluanţi organici persistenţi în soluri

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Persistent organic pollutants (POPs) are organic compounds that, to a varying degree, resist to photolytic, biological and chemical degradation. POPs are often halogenated and characterized by low water solubility and high lipid solubility. They are also semi-volatile, enabling them to move long distances in the atmosphere before deposition occurs. Various processes take place in soil, namely, volatilization, biodegradation, formation of strongly bounded residues. The main purpose of the paper was to analyze some aspects regarding a biological remediation system for soil and ground-water contaminated with chlorinated aromatic compounds, such as polychlorinated phenols (pentachlorophenol and tetrachlorophenol). This objective was accomplished through dynamic simulation based on analytical modelling under MATLAB software.
Pentachlorophenol (PCP) is a chlorinated hydrocarbon used for its pronounced bactericidal and fungicidal properties. The presence of pentachlorophenol as well as of tetrachlorophenol (TCP) in the environment is exclusively of anthropogenic origin. The simulation of the PCP biodegradation process was performed at different concentrations of the PCP and TCP, for that the dynamic profiles of the PCP, TCP and biomass in the biodegradation system were analyzed. The increasing of the PCP concentration led to increases in the biodegradation time and steady state establishing, while the TCP concentration affected the dynamic profile of the biomass concentration. The results showed that the biodegradation of polychlorinated phenols in soil can modeled and simulated, and that the process dynamics are related to the contaminants concentration as well as to the simultaneous influence of PCP/TCP presence.