

## Bioremediation as a Treatment of Aromatic Hydrocarbons in Wastewater

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**Abstract :** The treatment of aromatic hydrocarbons in wastewater resulting from oil spills and chemical factories is becoming a key concern in many modern countries. Benzene, ethylbenzene, toluene and xylene (BETX) contaminate groundwater as well as soil. These compounds have an acute effect on human health and are known to be carcinogenic. Conventional removal of these toxic materials involves separation and burning of the wastes, however, the cost of chemical treatment is very high and energy consuming. Bioremediation methods for removal of toxic organic compounds constitute an attractive alternative to the conventional chemical or physical techniques. Bioremediation methods use microorganisms to reduce the concentration and toxicity of various chemical pollutants. Toluene is biodegradable both aerobically and anaerobically, it can be growth inhibitory to microorganisms at elevated concentrations, even to those species that can use it as a substrate. In this research culture of *Pseudomonas putida* was grown in bath bio-reactor (BBR) with toluene 100 mg/l as a single carbon source under constant voltage of 125 mV, 250 mV and 500 mV. The culture grown in BBR reached to 0.8 OD<sub>660nm</sub> while the control culture that grown without external voltage reached only to 0.6 OD<sub>660nm</sub>. The residual toluene concentration after 147 h, in the BBR operated under external voltage (125 mV) was 22 % on average, while in the control BBR it was 81 % on average.

**Keywords :** bioremediation, aromatic hydrocarbons, BETX, toluene, *pseudomonas putida*

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