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BIODEGRADATION OF MTBE BY A MICROORGANISM CONSORTIUM

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Abstract:

Methyl Tert-Butyl Ether (MTBE) is one of the ether oxygenates which its use has been increased within the last twenty years. This compound is produced from isobutylene and methanol reaction that is used as octane index enhancer and also increases dissolved oxygen in gasoline and decreases carbon monoxide emission in four phased motors because of better combustion of gasoline. High solubility in water (52 g/L), high vapor pressure (0.54 kg/cm³), low absorption to organic carbon of soil and presence of MTBE in the list of potentially-carcinogens of U.S EPA has made its use of great concern. The culture media used in this study was Mineral Salt Medium (MSM). The study lasted for 236 days and in three different concentrations of MTBE of 200, 5 and 0.8 mg/L. A control sample was also used to compare the results. This research studied the isolation methods of microbial consortium in the MTBE polluted soils in Tehran and Abadan petroleum refinery besides MTBE degradation. The results showed the capability of bacteria in consuming MTBE as carbon source. Final microbial isolation was performed with several microbial passages as well as keeping consortium in a certain amount of MTBE as the carbon source.

Keywords:

fuel additives , MSM

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