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ABSTRACT BOOK



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MICROBIAL DEGRADATION OF AROMATIC FRACTION FROM DIESEL FUEL

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Backgrounds

Diesel fuel is a complex mixture of alkanes and aromatic compounds that can be harmful if released into the environment. Various microorganisms capable of petroleum degradation were isolated, however the most difficult task is the degradation of polycyclic aromatic hydrocarbons (PAHs). They are a large class of compounds that can be mutagenic and carcinogenic (1). Due to their high molecular masses and hydrophobicity, they adsorb to soil particles, which limits their bioavailability to microorganisms (2).

Objectives

Aim of this study was to separate aromatic fraction from diesel fuel and then to investigate the microbial biodegradation of aromatic fraction.

Methods

Aromatic fraction was separated from diesel fuel on silica gel column by elution with hexane and mixture of hexane:toluene, respectively (3). The bacterial strain *Rhodococcus sp.* RNP05, isolated from petroleum contaminated soil was inoculated into mineral medium where the only source of carbon was aromatic fraction. The remaining aromatic fraction was determined after 30 days by GCxGC/MS.

Conclusions

The aromatic fraction of diesel fuel consists mainly of aromatic hydrocarbons. The results showed the reduction of aromatic fraction concentration in samples after 30 days of degradation. From the GCxGC/MS chromatograms it can be seen that the naphthalens and biphenyls are almost completely removed.

References

1. Chen et al., *Biotechnol. Adv.* 33 (2015) 745-755.
2. Johnsen et al., *Environ. Pollut.* 133 (2005) 71-84.
3. Olsen et al., *Environ. Toxicol. Chem.* 18 (1999) 2448-2453.