A Microcosm Study on P-nitrophenol Biodegradation in Slurry Phase by Alcaligenes faecalise and Screening of Effective Factors

Bioremediation of soils contaminated with nitroaromatic hydrocarbons has recently attracted the attention of researchers due to their toxic effects among which p-nitrophenol (PNP) can be discharged into soil matrices during production, distribution, and application of pesticides, insecticides and drugs. The purpose of this study is to examine PNP biodegradation in a microcosm consisting of kaolanic clay soil in order to decrease its pollution by A. faecalise, the superior bacterium among the four bacterial species tested. To detect the effective factors on PNP biodegradation, Plackett-Burman design method was employed using eight factors consisting of PNP concentration (ţ, mg kg⁻¹), temperature (ţ, °C), soil-water ratio (ţ, % (v/w)), initial pH (ţ, 9), inoculum size (ţ, 1 %), yeast concentration (ţ, 1 g l⁻¹), glucose (ţ, 1 g l⁻¹) and preexposure to PNP (ţ, 3 mg kg⁻¹). PNP reductions of ţ.9% up to ţ0.0% were obtained in soil slurries using A. faecalise under the conditions used after ţ2 days. Analyses of variance revealed that 8 out of 8 factors had significant effect on PNP biodegradation. By using ţ center points, it was also found that significant curvature exists in the design space and hence non-linear design methods should be used to find out the optimal conditions for PNP removal in slurry phase.
این صفحه به معنایی تایید نمی‌شود. مقاله در پایگاه استادی سیویلیکا می‌باشد. در هر لحظه به منظور تایید اصلاح این گواهی می‌توانید وضعیت ثبت مقاله را از طریق لینک فوق به صورت آنلاین کنترل نمایید.