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Abstract:

The aim of this work was to study the biodegradation of Malathion in batch and continuous packed bed (Polyurethane foam; PUF) bioreactor (PBBR). After 10 days, 89% Malathion removal was observed in batch PBBR. Continuous PBBR was operated at various flow rates (5–30mL/h) under optimum condition over a period of 75 days. Inlet loading rates and elimination capacities were observed in the range of 36-216 and 7.20-145.4 mg/L/day with an average removal efficiency of more than 90 % under steady state conditions. GC/MS analysis confirms phosphorodithionicacid,O,O,S-trimethylester and diethylmercaptosuccinate as metabolites. Biodegradation of Malathion under inhibitory and non-inhibitory conditions was studied using Monod and Andrew-Haldane models and the kinetic constants were calculated and found to be μ_{max}:0.271 per day; *Ks*: 126.3 mg/L using Monod and μ_{max}:0.315 per day; *Ks*:151.32 mg/L; *Ki*: 594.75 mg/L using Andrew-Haldane models.

Keywords: Continuous packed bed reactor, kinetic parameter, Malathion, removal efficiency, GC-MS

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