

Treatment of Septic Tank Effluent Using Moving Bed Biological Reactor

Authors : Fares Almomani, Majeda Khraisheh, Rahul Bhosale, Anand Kumar, Ujjal Gosh

Abstract : Septic tanks (STs) are very commonly used wastewater collection systems in the world especially in rural areas. In this study, the use of moving bed biological reactors (MBBR) for the treatment of septic tanks effluents (STE) was studied. The study was included treating septic tank effluent from one house hold using MBBRs. Significant ammonia removal rate was observed in all the reactors throughout the 180 days of operation suggesting that the MBBRs were successful in reducing the concentration of ammonia from septic tank effluent. The average ammonia removal rate at 25°C for the reactor operated at hydraulic retention time of 5.7 hr (R1) was 0.540 kg-N/m³ and for the reactor operated at hydraulic retention time of 13.3hr (R2) was 0.279 kg-N/m³. Ammonia removal rates were decreased to 0.3208 kg-N/m³ for R1 and 0.212 kg-N/m³ for R3 as the temperature of reactor was decreased to 8 °C. A strong correlation exists between theta model and the rates of ammonia removal for the reactors operated in continuous flow. The average Θ values for the continuous flow reactors during the temperature change from 8°C to 20 °C were found to be 1.053±0.051. MBBR technology can be successfully used as a polishing treatment for septic tank effluent.

Keywords : septic tanks, wastewater treatment, morphology, moving biological reactors, nitrification

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