



Title: Application of Moving Bed Biofilm Process for Biological Organics and Nutrients Removal from Municipal Wastewater

Author: M. Kermani, B. Bina, H. Movahedian, M.M. Amin and M. Nikaein

Source: American J. of Environmental Sciences 4(6): 675-682 , 2008

Abstract: In this study, experiments have been conducted to evaluate the organics and nutrients removal from synthetic wastewater by a laboratory scale moving bed biofilm process. For nutrients removal, moving bed biofilm process has been applied in series with anaerobic, anoxic and aerobic units in four separate reactors. Moving bed biofilm reactors were operated continuously at different loading rates of nitrogen and Phosphorus. During optimum conditions, close to complete nitrification with average ammonium removal efficiency of 99.72% occurred in the aerobic reactor. In the aerobic reactor, the average specific nitrification rate was 1.8 g NO_x-N kg VSS⁻¹ h⁻¹. The results of the average effluent soluble COD concentration from each reactor showed that denitrification process in the second anoxic reactor consumed most of the biodegradable organic matter. As seen from the results, denitrification rate has increased with increasing NO_x-N loading in the second anoxic reactor. The aerobic phosphate removal rate showed a good correlation to the anaerobic phosphate release rate. Moreover, phosphate removal rate showed a strong correlation to the phosphate loading rate in the aerobic reactor. In optimum conditions, the average SCOD, total nitrogen and phosphorus removal efficiencies were 96.9, 84.6 and 95.8%, respectively. This study showed that the moving bed biofilm process could be used as an ideal and efficient option for the total nutrient removal from municipal wastewater.