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## APPLICATION OF DOWNFLOW ANAEROBIC UPFLOW OXIC SUBMERGED BIO-FILM REACTOR (DAUOSBR) IN REMOVING PHOSPHORUS, NITROGEN, ORGANIC MATTER, TURBIDITY AND TOTAL SUSPENDED SOLIDS FROM HOSPITAL WASTEWATER

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### Abstract

Aerobic treatment processes using attached media have been studied extensively to remove organic matter from wastewater and also denitrification process. The objective of this study was to assess the ability of down flow anaerobic up flow oxidic submerged bio-film reactor (DAUOSBR) to remove phosphorus, nitrogen compounds, BOD<sub>5</sub>, COD, turbidity and total suspended solids from the Farabi Hospital wastewater. The present work involved designing and building a reactor loaded with down flow anaerobic up flow oxidic submerged bio-film reactor, thereby a total of 450 samples were taken from the inlet and outlet of the treatment plant to evaluate the efficiency of the system. The results on stage of the operation (three parts) showed that the removal rate of COD, BOD<sub>5</sub>, TSS, Phosphorus and turbidity at the third stage and Nitrogen, TKN at the second zone were excellent. Comparatively the average removal efficiency of the mentioned parameters (except COD and TSS) showed a significant difference within three retention times ( $P_{\text{value}} < 0.05$ ). This system has exhibited high performance and capacity with regard to the removal of the selected parameters from hospital wastewater. Thus, the optimal times of 3.6 h and 1.4 h under aerobic and anaerobic conditions for the removal of ammonia nitrogen as well as 4 h and 1.5 h under aerobic and anaerobic conditions for the removal of phosphorus, organic matter, suspended solids and turbidity, were obtained, respectively.

*Key words:* hospital wastewater, nitrogen compounds, organic matter, phosphorus, submerged bio-film

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