

**PERFORMANCE STUDY OF WASTEWATER TREATMENT  
BY SAND-MEDIA AEROBIC BIOLOGICAL FILTER**

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**ABSTRACT**

Experiments on aerobic biological filter (ABF) were conducted to investigate its efficiency on organic carbon removal. Two identical laboratory scale ABF units were made of transparent plastic with inside diameter of 150-mm and packed with 1.0 m depth of 1.49 mm sand media. The ABF units were used to treat synthetic wastewater whose COD concentrations were 100-120 mg/L. The ABF units were operated in down-flow with liquid flow rate of 0.072 – 0.864 m<sup>3</sup>/d. The steady state performance was evaluated under hydraulic loading rates (HLR) from 4.8 to 57.6 m<sup>3</sup> (m<sup>2</sup>.d) and organic loading rates (OLR) from 0.56 to 5.73 g COD/(L.d). The ABF unit was found to perform satisfactory when operating from low OLR of 0.56 g COD/(L.d) up to 3.46 g COD/(L.d), in which the organic removal efficiency of 94% was reached on the total COD basis and of 96% on the filtered COD basis. Its removal efficiency was found to increase with decreasing HLR and increasing media depth. Based on the experiment results obtained, a simplified mathematical model which described the behavior of substrate in ABF was proposed. This mathematical model could describe the ABF performance satisfactorily.