Grey water treatment and reuse by using RBC: A kinetic approach

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Abstract

Grey water treatment with rotating biological contactor (RBC) was investigated to assess water reuse potential. The study involves influent characterization, setting-up and operation of two RBCs, conformity assessment of the effluent for reuse and determination of the biofilm kinetics. Monod and variable order models were applied. Biofilm characteristics, such as weight per unit area and thickness were measured. Nitrification and mineralization processes took place in the biofilm matrix simultaneously. About 85% CODT and 75% TKN removal efficiencies were achieved. The average effluent BOD5 concentration was 7 mg L−1. The reaction showed typical zero-order, 0° kinetic relation. The 0° rate constant was determined as 5.7 ± 1.5. UV light was used for disinfection of treated grey water. Efficiency, operational ease, reliability, and personnel requirements were compared with the other grey water treatment processes. It is concluded that RBC may be effectively used for grey water treatment and the effluent can be reused for toilet flush purposes after disinfection. However, it is recommended that detached particles from biofilm should be further removed by filtration.

Keywords: Grey Water; Treatment; Reuse/recycle; Biofilm kinetics; RBC

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