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TREATMENT OF WASTEWATER WITH A HIGH C/N RATIO IN SEQUENCING BATCH BIOREACTOR (SBBR) CONTAINING BIOCARRIER

Beenish Saba^{1,3*}, Bushra Zaman¹, Tariq Mahmood¹, Sher Jamal Khan²

¹PMAS Arid Agriculture University Rawalpindi, Department of Environmental Sciences, Rawalpindi, Pakistan

²National University of Sciences and Technology, School of Civil and Environmental Engineering, Islamabad, Pakistan

³The Ohio State University, Columbus, Department of Food Agricultural and Biological Engineering, Ohio, USA

Abstract

Wastewater treatment using sequencing batch reactor (SBR) has certain advantages over conventional activated sludge system. The performance of sequencing batch reactor in treating high C/N ratio was investigated with suspended polyurethane and polystyrene attached growth biomass configuration. A sequence of 4 hr HRT, 0.3 month SRT and 1kg COD/m³ was employed to study treatment efficacy. Treatment performance was assessed by means of chemical oxygen demand (COD), total nitrogen (TN) and total phosphorus (TP) removal. Operational parameters were pH, dissolve oxygen (DO), suspended solids (SS), volatile solids (VS), Sludge volume index (SVI), sludge density index (SDI) and these parameters were monitored throughout the operational period. COD removal in suspended growth biofilm bioreactor (SGSBBR) was 96.6±1.5 and in attached growth biofilm bioreactor (AGSBBR PU) 97.1±1.2; (AGSBBR PS) was 96.7±0.96. COD removal efficiency of both systems was almost equal however TN and TP removal of AGSBBR was 6-7% higher than SGSBBR. Ratio of mixed liquor suspended and volatile growth of biomass ranges from 1-3. Adsorption of naphthalene was also observed in batch experiments on biomass at variable pH. Acidic pH provide reducing medium in solution and enhanced adsorption. Enhanced performance of AGSBBR with addition of media provides attachment surface and enhances mineral removal efficiency.

Keywords: Biocarriers, high strength wastewater, mineral removal efficacy, sequencing batch reactor

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* Author to whom all correspondence should be addressed: e-mail: beenishsaba@uaar.edu.pk