



“Gheorghe Asachi” Technical University of Iasi, Romania



ENHANCED COPPER REMOVAL AND BIOGAS PRODUCTION THROUGH INTERMITTENT OPERATION OF COUPLED MODIFIED UPFLOW WITH STATIC GRANULAR BED REACTOR TREATING COPPER-CONTAINING WASTEWATER

Mariraj Mohan Sundararajan^{1*}, Swathi Thirunavukkarasan²

¹Thanthai Periyar Government Institute of Technology, Vellore - 632002, Tamilnadu, India

²Alagappa Chettiar Government College of Engineering and Technology, Karaikudi- 630003, Tamilnadu, India

Abstract

The performance of the modified upflow anaerobic sludge blanket (MUASB)-static granular bed reactor (SGBR) series in the intermittent mode for the treatment of wastewater containing copper (8 mg/L) was analyzed. The reactor series was found to be capable of copper removal besides chemical oxygen demand (COD) removal. The maximum COD removal of the reactor series was 98.5±0.29%. The corresponding copper removal and overall biogas production were 80.38±1.61% and 0.232 m³/kg COD_{digested}, respectively. Intermittent operation enhanced the robustness of the SGBR downstream. The copper and COD concentrations of the effluent were well within the discharge standards throughout the operational period. Biogas production of the reactor series in the present study was reduced by 44.67% when compared to the control operation without copper. Reactor height was also found to influence copper removal. One-way analysis of variance (ANOVA) showed that the biogas production and copper removal of the reactor series in intermittent operation increased significantly when compared to the continuous operation with a hydraulic retention time (HRT) of 24 h.

Key words: biogas, copper removal, intermittent, MUASB, SGBR

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* Author to whom all correspondence should be addressed: e-mail: mari_sundar@yahoo.com