



Effect of intermittent operation of lab-scale upflow anaerobic sludge blanket (UASB) reactor on textile wastewater treatment

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ABSTRACT

Different intermittent phases were introduced during the continuous operation of upflow anaerobic sludge blanket reactor treating simulated textile wastewater using single dye. The reactor was operated at an organic loading rate of 2 kg COD/m³ d and hydraulic retention time (HRT) of 24 h to optimize the non-feeding period of reactor for maximum chemical oxygen demand (COD) and color removal rates. The optimized combination was then operated for mixed dyes solution. Feeding period of 12 h and non-feeding period of 12 h (12F/12NF) gave COD and color removal of 57.5% and 71.0%, respectively. The similar cycle was operated using mixed dye feed with increase in dye concentration to 30 mg/L at same operating conditions. Maximum COD and color removal efficiency of 47.8% and 38.3% was achieved. The decreased removal rates for mixed dyes were due to the presence of intermediate metabolites produced by chromogenic breakdown of dyes. The above optimized condition was extended to 48 h HRT (12F/12NF/12F/12NF) with dyes concentration of 50 mg/L. Improved COD and color removal rates of 67.0% and 77.8% were achieved.

Keywords: Dye adsorption; Intermittent operation; Textile wastewater; Upflow anaerobic sludge blanket reactor

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