

Thesis Title	Treatment of Disperse Dye Wastewater by Upflow Anaerobic Sludge Blanket Process
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Abstract

This study was to investigate the treatability of disperse dye wastewater by an upflow anaerobic sludge blanket (UASB) reactor. Two bench-scale UASB reactors of 4.825 liters were fed with disperse dye wastewater from a local dye-house with the average of COD and color intensity in SU and ADMI units of 1,600 mg/l, 40, and 400, respectively. Hydraulic retention times (HRTs) were controlled at 3.3, 13.2, 24 and 36 hours which were equivalent to the organic loading rates of 11.70, 2.90, 1.60 and 1.07 kg COD/m³-day or 2.34, 0.66, 0.37 and 0.27 kg COD/kg MLVSS-day, respectively. For the HRTs of 3.3, 13.2, 24 and 36 hours, the COD removal efficiencies were 20, 30, 35 and 45 percent while the decolorization efficiencies were 20, 30, 30 and 30 percent for SU and 14, 28, 28 and 28 percent for ADMI, respectively. The decolorization efficiency in term of color intensity was considerably low, however, the color has changed from red or purple to typical yellow similar to that of natural surface water. Unimpressive COD removal efficiency maybe due to a refractory characteristic of wastewater itself coupling with a considerably short contact time between biomass and wastewater in the reactors. The methane yields were 0.105, 0.096, 0.095 and 0.089 l/g COD removal for the four HRTs, respectively. The results suggest that, with proper operation and control, the UASB is a promising first-stage process of the anaerobic + aerobic configuration for decolorization and organic degradation.

Keywords: Decolorization / Disperse Dye / Dye Wastewater / UASB / Anaerobic Process