



## **Anaerobic Mesophilic and Thermophilic Treatment of Concentrated Latex Processing Wastewater in Two-Stage Upflow Anaerobic Sludge Blanket (UASB)**

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**Abstract:** The objective of this study is to determine optimal conditions for operating the two-stage upflow anaerobic sludge blanket (UASB) used for treating wastewater from concentrated latex mills. Mesophilic and thermophilic conditions as well as hydraulic retention time (HRT), and pH were determined. Effect of NH<sub>3</sub> on treatment inhibition was also investigated. The results indicated that mesophilic condition (35 °C) was an optimal temperature, whereas the pH of system should be controlled at 7 to prevent rubber coagulation. The HRT at 24 hrs and 48 hrs were optimal HRT for acid tank and UASB tank, respectively. In case of NH<sub>3</sub>, inhibition on methane producing bacteria was observed at 1,000 mg/l NH<sub>3</sub>-N, and strong inhibition occurred at 3,000 mg/l NH<sub>3</sub>-N, since % COD removal was relatively reduced from 37.32 mg/l (at 1,000 mg/l NH<sub>3</sub>-N) to 7.98 mg/l. The two-stage UASB was then applied with above-mentioned optimal conditions with real wastewater at latex mill. It was found that methane production was about 0.116 l CH<sub>4</sub>/g COD removed (16.257-22.76 m<sup>3</sup>CH<sub>4</sub>/d), and average COD and SS removal efficiency were about 81.08 % and 94.22 %, respectively. In case of SS removal, the results reveal that the two-stage UASB is capable to overcome limitation of the single-stage UASB in treating concentrated latex effluent.

**Keywords:** *Two-stage UASB, Concentrated latex, Mesophilic, Thermophilic, Ammonia*

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