

## A comparison between anaerobic and aerobic biological treatment for real wastewater containing high concentration of dimethylamine: case study of wastewater from artificial leather production

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### ABSTRACT

In this work, a feasibility study into the treatment process of artificial leather wastewater using both activated and anaerobic sludge was performed. The effects of biomass concentration, different feed dilutions as well as the presence of a nutrient medium in both conditions were examined. The results indicated that as the mixed liquor suspended solids were increased from 800 to 3000 mg/L, chemical oxygen demand (COD) removal increased 41% and 10% in aerobic and anaerobic conditions respectively. Adding nutrient medium had no significant effect on COD removal in both conditions. Under aerobic conditions and at a lower hydraulic retention time of 3 d, COD removal was about 99% while in anaerobic conditions and in similar situations maximum COD removal was up to 60% during 7 d. The effects of amendment of two carbon sources (glucose and methanol) were investigated and results indicated that in comparison with methanol, using glucose as the carbon source could lead to higher COD removal, under anaerobic conditions (23%) while it has no significant effect at the aerobic condition. In conclusion, COD removal was higher under aerobic conditions than anaerobic conditions. Furthermore, dimethylamine concentration in treated wastewater under aerobic conditions was below the detected limit of the analyzer (<1 ppb).

**Keywords:** Activated sludge; Anaerobic sludge; Artificial leather; Biological treatment; Dimethylamine

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