

Treatment of azo dye Acid Orange 7 containing wastewater using up-flow constructed wetland with and without supplementary aeration

Abstract

The aim of this study is to examine and compare the treatment performance of Acid Orange 7 (AO7) containing wastewater by up-flow constructed wetland (UFCW) at different AO7 concentrations, hydraulic retention times (HRT) and alternative of supplementary aeration. The aerated wetland reactor outperformed the non-aerated one in the removal of organic matters, $\text{NH}_4\text{-N}$ and aromatic amines. The T-P removal efficiency for both wetland reactors was not much different throughout the study and the supplementary aeration showed no significant effect on T-P removal. As influent AO7 concentration increased from 50 to 100mg/L, the performance in biodegradation of organic matters and nitrification in the non-aerated wetland reactor, and denitrification and decolorization in the aerated wetland reactor were affected. As HRT increased from 3 to 6d, the removal of $\text{NH}_4\text{-N}$ and $\text{NO}_3\text{-N}$ in the aerated wetland reactor was not significantly different, but the $\text{NH}_4\text{-N}$ removal efficiency improved tremendously in the non-aerated wetland reactor.