

Artificial aeration to enhance the mineralization of mono azo (methyl orange)-containing wastewater using recirculated up-flow constructed wetland

Abstract

The aim of this study is to evaluate the treatment performance of mono azo dye Methyl Orange (MO)-containing wastewater by recirculated up-flow constructed wetland (UFCW) with and without supplementary aeration. The successive anaerobic and aerobic treatment of the UFCW reactors could effectively remove color, organic matters and intermediate aromatic amines simultaneously in a single reactor. With influent 50 mg/L of MO, the removal efficiencies of COD and MO were 91 and 75 %, respectively, in the aerated wetland reactor, whereas the removal efficiencies were 86 and 93 %, respectively, in the non-aerated wetland reactor. The aerated wetland reactor outperformed the non-aerated wetland reactor in the removal of organic matters and aromatic amines. The accumulation of aromatic amines in the non-aerated wetland reactor was observed as shown in the increase of ratio absorbance at 270 nm/465 nm and UV-Vis spectra analysis.

Keywords

Artificial aeration; Azo dye; Constructed wetland; Methyl orange; Recirculated ufcw