Treatment of Textile Effluents by H$_2$O$_2$/UV Oxidation Combined with RO Separation for Reuse

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Abstract

This study evaluates the feasibility of the treatment of textile effluents by H$_2$O$_2$/UV oxidation combined with reverse osmosis (RO) membrane separation for water reuse in textile dying processes. The results showed that the conductivity of textile effluents was from 2340 to 4560 µs/cm. Addition of auxiliary chemicals used during the dyeing processes increased the conductivity in textile wastewaters. The H$_2$O$_2$/UV pre-oxidation of textile effluents can mineralize or oxidize dissolved organic carbon (DOC) effectively. However, the removal of conductivity and hardness were poor. Pretreatment of the textile effluent by H$_2$O$_2$/UV oxidation can decrease silt density index (SDI) values and osmotic pressure and increase permeate flux when followed by RO separation. H$_2$O$_2$/UV pre-oxidation and RO post-treatment can improve the textile effluent quality and meet the water quality criteria for water reuse in the textile industry. In conclusion, the combined H$_2$O$_2$/UV pre-oxidation and RO post-process is a promising treatment for textile effluents for water reuse.