

Combination of adsorption and biodegradation processes for textile effluent treatment using a granular activated carbon-biofilm configured packed column system

Abstract

The objective of this study was to investigate the feasibility of using a granular activated carbon-biofilm configured packed column system in the decolorization of azo dye Acid Orange 7-containing wastewater. The Acid Orange 7-degrading microbial from anaerobic sequencing batch reactor which treating the azo dye-containing wastewater for more than 200 d was immobilized on spent granular activated carbon (GAC) through attachment. The GAC-biofilm configured packed column system showed the ability to decolorize 100% of the azo dye when working at high loading rate of Acid Orange 7 at 2.1 g/(L·d) with treatment time of 24 h. It was observed that the decolorization rate increased along with the increasing of initial Acid Orange 7 concentrations, until it reached an optimum point at about 0.38 g/h with initial Acid Orange 7 concentrations of 1,150 mg/L and the decolorization rate tend to be declined beyond this concentration.