

# **Decolorization of Orange II using an anaerobic sequencing reactor with and without co-substrates**

## **Abstract**

We investigated the decolorization of Orange II with and without the addition of co-substrates and nutrients under an anaerobic sequencing batch reactor (ASBR). The increase in COD concentrations from 900 to 1750 to 3730 mg/L in the system treating 100 mg/L of Orange II-containing wastewater enhanced color removal from 27% to 81% to 89%, respectively. In the absence of co-substrates and nutrients, more than 95% of decolorization was achieved by the acclimatized anaerobic microbes in the bioreactor treating 600 mg/L of Orange II. The decrease in mixed liquor suspended solids concentration by endogenous lysis of biomass preserved a high reducing environment in the ASBR, which was important for the reduction of the Orange II azo bond that caused decolorization. The maximum decolorization rate in the ASBR was approximately 0.17 g/hr in the absence of co-substrates and nutrients.