Simultaneous reduction of hexavalent chromium and decolorization of orange II in photo/ferricarboxylate system

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ABSTRACT

Simultaneous reduction of hexavalent chromium (Cr(VI)) and decolorization of orange II (OII) was mainly investigated in homogeneous photo/ferricitrate system utilizing a metal halide lamp as the primary light source. It has been found that under certain conditions, the percentage reduction for Cr(VI) and percentage decolorization for OII reaches 85% and 51% after 60 min, respectively, indicating that the photo/ferricitrate system is effective for simultaneous reduction of Cr(VI) and decolorization of OII. The percentage reduction for Cr(VI) and percentage decolorization for OII in such system strongly depends on the operating parameters, such as light intensity, initial pH and initial concentrations of Fe(III) and citric acid, and the influence of initial concentrations of Fe(III) and citric acid on reduction of Cr(VI) differs from decolorization of OII. Photo/ferricitrate system only under solar light also has certain photoactivity for those reactions. Homogeneous photo/ferritartrate system is also effective for simultaneous reduction of Cr(VI) and decolorization of OII.

Keywords: Hexavalent chromium; Orange II; Carboxylic acid; Photoreduction; Photodecolorization