



Investigation of the oxidative decolorization of Acid Red 14 by peroxydisulfate with thermally activated and Ag(I) catalysis

Mohammad Hossein Rasoulifard^{a,*}, Seyed Mohammad Mahdi Doust Mohammadi^b, Azam Heidari^c

^aFaculty of Science, Department of Chemistry, Zanzan University, P.O. Box 45195-313, Zanzan, Iran
Tel. +98 241 5152591; email: m_h_rasoulifard@yahoo.com

^bDepartment of Applied Chemistry, Islamic Azad University of Tabriz, P.O. Box 1655, Tabriz, Iran

^cSchool of Medicine, Department of Molecular Medicine, Zanzan University of Medical Sciences, Zanzan, Iran

Received 1 March 2010; Accepted 1 July 2010

ABSTRACT

The present study investigates the degradation of Acid Red 14 (AR 14), commonly used as a textile dye, in aqueous medium through the process of thermally activated oxidation by peroxydisulfate under a set of variables (concentration of $S_2O_8^{2-}$, AR 14, Ag^+ and temperature). Degradation efficiency was small when the oxidation was carried out in the absence of heat. Increasing the temperature from 20 to 70 °C accelerated the oxidation rate of AR 14, which achieved complete oxidation in 10 min. Also results showed that removal of dye increased with increasing Ag^+ , peroxydisulfate initial concentration, pH and dye initial concentration decreasing. Our results suggest that the oxidative treatment of AR 14 by peroxydisulfate activated with heat is a viable option for removal of the textile dyes from effluents.

Keywords: Advanced oxidation process; Acid Red 14 degradation; Peroxydisulfate; Thermal; Wastewater treatment

*Corresponding author.