Kinetics of Oxidation of Aliphatic Alcohols by Potassium Dichromate in Aqueous and Micellar Media

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The oxidation of alcohols has been studied extensively using different oxidizing agents and in various media [1-3]. One of the mostly used oxidant was potassium dichromate and its derivatives. In going through the literature, one finds controversial results regarding the kinetics of these reactions though all studies have proposed similar mechanisms. Some reports suggested the applicability of pseudo-first order kinetics with Michaelis-Menten rate equation [1, 2]. Moreover, the reaction has not yet been studied in surfactant media to examine the micellar effect on the reaction rate. This was motivated us to carry out the work on the oxidation of some aliphatic alcohols and try to resolve some of these issues. The kinetics of oxidation of four aliphatic alcohols in acidic aqueous and micellar media has been investigated. The reaction was found to be first order with respect to both alcohol and oxidant. The pseudo first-order rate equation was found to be perfectly applicable with ethanol, 1-propanol and 2-propanol while deviation was observed at intermediate stages of the reaction with methanol (Fig.1). The pseudo first-order rate constants were found to be independent on the concentration of the oxidant. The presence of TX-100 enhanced the rate of the reaction for all alcohols. Negative effects were observed with addition of KCl salt to the reaction mixture. Suitable mechanism for the reaction was suggested which agrees with the experimental findings.

\textbf{REFERENCES}