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**Effect of cetyltrimethylammonium bromide on the oxidation of phthalic acid by MnO<sub>4</sub><sup>-</sup> in aqueous medium**

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**Abstract**

The conventional ultraviolet-visible (UV)-visible spectrophotometric technique was used to monitor the kinetics of the oxidation of phthalic acid by permanganate in absence and presence of cationic micelles of cetyltrimethylammonium bromide (CTAB). Under pseudo-first order conditions ( $[\text{phthalic acid}] \geq [\text{MnO}_4^-]$ ), the oxidation kinetics follows a complicate reaction path (the reaction rate decreases monotonically with  $[\text{phthalic acid}]$  which suggest the formation of more than one permanganate- phthalic acid complexes, out of these one of the complex has resistance toward the oxidative cleavage). The micellar catalysis is attributed to the formation of ion-pair between CTAB sub-aggregates and reactants as well as increase in the concentration (solubilization) of both reactants and/or intermediate in the micellar pseudo phase. The changes observed in the direction of the rate constants- $[\text{H}^+]$  profile correspond to the acid catalyses. The catalytic effect of CTAB may be due to the solubilization and incorporation of both the reactants into the Stern layer of the micelles and results have discussed in terms of pseudo-phase model of the micelles proposed by Menger and Portnoy and modified by Bunton et al. Mechanisms consistent with the observed kinetic data have been proposed. The effects of electrolytes,  $\text{MnCl}_2$ ,  $\text{NaF}$ ,  $\text{NaBr}$ , and  $\text{NaNO}_3$ , have also been studied and discussed. On the bases of observed results, a suitable mechanism has been proposed. © Taylor & Francis Group, LLC.

**Author Keywords**

Kinetics; Micellar catalysis; Micelles; Oxidation; Phthalic acid