

Dynamics of CTAB micelle mediated reaction of fuchsin degradation in alkaline medium

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Abstract. Cetyltrimethylammonium bromide (CTAB) micelles catalyzed the degradation of fuchsin in the entire surfactant concentration range investigated. The pseudo first order rate constants increased with CTAB concentrations. However, there was a decrease in the rate constant at higher concentrations of CTAB. Increase in the rate constant was attributed to the incorporation of fuchsin and hydroxide ion in the stern layer of the CTAB micelles. The kinetics involved the removal of the π -conjugation in fuchsin due to its attack by hydroxide ion on the central C atom of the planar ring which led to the formation of carbinol. The reaction showed first order each to fuchsin and OH⁻. Menger-Portnoy and Piskiewicz cooperative models were used to explain the micellar and kinetic effects.

Keywords: cetyltrimethylammonium bromide (CTAB); fuchsin; sodium hydroxide; potassium nitrate; pseudo-phase model.

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