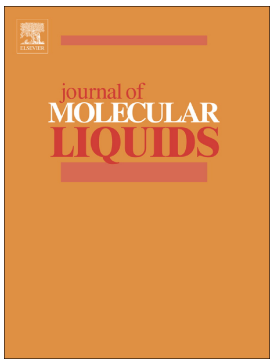


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# Influence of surfactants/polyethylene glycols mixture on the kinetics of alkaline hydrolysis of tetracaine

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## Abstract

The influence of the surfactants namely sodium dodecyl sulphate; SDS, cetyltrimethyl ammonium bromide; CTABr, and Triton-X-100; TX-100 and polymeric surfactants (*viz.* polyethylene glycols; PEG) on the rate of hydrolysis of tetracaine in the alkaline medium has been studied spectrophotometrically. The pseudo-first-order conditions were maintained by keeping $[OH^-]$ >> [tetracaine]. The rate of hydrolysis of tetracaine was found to be linearly dependent upon the concentration of NaOH in the concentration range from $2.0 \times 10^{-2}$ mol $dm^{-3}$ to $1.7 \times 10^{-1}$ mol $dm^{-3}$ at a fixed concentration of tetracaine at $4.0 \times 10^{-5}$ mol $dm^{-3}$. The values of rate constant were found to be independent on the concentration of tetracaine in the concentration range from $1.0 \times 10^{-5}$ mol $dm^{-3}$ to $6.0 \times 10^{-5}$ mol $dm^{-3}$ at a fixed concentration of NaOH at $5.0 \times 10^{-2}$ mol $dm^{-3}$. The rate of hydrolysis of tetracaine decreased with the increase in the [surfactants] and [PEG-surfactant]. Low molecular weight gave higher values of binding constant for tetracaine in comparison to higher analogues. This indicates that the lower molecular weight PEGs give more compact structure with CTABr. The increase in PEGs concentrations from 1% to 3% (w/v) increased the rate constant values slightly due to break in the water structure, interfacial adsorption of surfactants and lowering in viscosity of media. The observed results were treated in the light of pseudophase and pseudophase ion exchange models and the various kinetic parameters *e.g.*, the binding constants for tetracaine with the micelles ($K_s$) and PEG-surfactant ($K_p$) and the values of rate constant in the micellar ($k_m$) and PEG-surfactant ($k_p$) were determined.

**Keywords:** Alkaline hydrolysis; tetracaine; PEG; SDS; CTABr; TritonX-100

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