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Surface Properties of Amphiphilic Drugs in Presence of Cationic Surfactants

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Abstract — Surface properties of two amphiphilic drugs i.e. amitriptyline and imipramine have been studied in the absence and presence of some cationic surfactants i.e. alkyltriphenylphosphonium bromide [R = 16 (CTPB), R = 14 (TTPB)] and alkyldiethylthanolammonium bromide [R = 16 (CDEEAB), R = 14 (TDEEAB)] by surface tension measurement at 300 K. The critical micelle concentration (CMC), maximum surface excess concentration at the air/water interface (Γ_{\max}), minimum area per surfactant molecule at the air-water interface (A_{\min}) and the surface pressure at the CMC (π_{CMC}) have been determined. Γ_{\max} value increases and CMC/ π_{CMC} decrease & with an increasing mole fraction of surfactants. The solubility of amphiphilic drugs in cationic surfactant systems has also been studied.

Keywords : *Amphiphilic drug, additives, cationic surfactant, surface properties, surface tension*

INTRODUCTION

The micellar and interfacial properties of amphiphilic drugs are very useful in the pharmaceutical science. Many drug molecules are amphiphilic and self-associate in aqueous environment to form small aggregates, above their critical micelle concentration (CMC) [1]. This surface-active behavior among many diverse classes of drugs has been reported and attempts have been made to correlate surface and biological activities [1–3]. The aggregation of the above drugs follows the same

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