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A Study of Insoluble Monolayers of Polyoxyethylene-octadecanols and Solubilization of Hemicyanine Dyes in CTAB Micelles

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Abstract — The Force–Area (F–A) isotherms of Polyoxyethylene-octadecanol (PEO) monolayers at the air-water interface were recorded using Langmuir-Wilhelmy Balance. The effects of changing hydrophilicity of the spread molecules, temperature and different salts in the subphase on the PEO monolayers are determined and discussed. The changes in the water structure expand the PEO monolayer demonstrating strong hydration of ethylene groups.

Solubilization of hemicyanine dyes by micelles of cationic surfactants was also investigated. Hydrophobic interaction and incorporation of the dyes in the micelles is discussed in terms of partition coefficients and free energy change, determined by differential spectroscopy. Lengthening of the dialkyl chains of the hemicyanine dyes led to greater hydrophobic interaction and consequently enhanced solubility.