Synopsis of Original Research Paper

Adsolubilization of an UV absorbent into Multi-chained Surfactant Adsorbed Layer on Titanium Dioxide

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When surfactants are adsorbed on particles, micelle-like surfactants are often formed on particles, which are called admicelles. Admicelles exhibit an incorporation of hydrophobic compounds as well as micelles. This incorporation has been referred to adsolubilization. The objective of this work was to investigate adsolubilization of 4-tertbutyl-4'-methoxydibenzoylmethan (Parsol) into surfactant adsorbed layer on titanium dioxide. The surfactants used were single-chained, double-chained, and gemini cationic surfactants. At first, since Parsol was not soluble in water, solubilization behavior of Parsol into cationic surfactants was characterized. It was found that the solubilized amount of Parsol increased with the surfactant concentration where the double-chained surfactants provided higher solubilized amount compared with the others.

Adsolubilization experiments were conducted as a function of feed concentration of Parsol under a constant surfactant concentration. The constant surfactant concentrations were above the cmcs of the respective surfactants. The adsolubilized amount of Parsol increased with increasing feed concentration of Parsol; the order of the adsolubilized amount by the surfactant was double-chained > single-chained > gemini surfactant. From the admicellar partitioning coefficients of Parsol it was found that Parsol was preferencially adsolubilized into the single-chained and double-chained surfactants compared to that of gemini surfactants. In addition, the surfactants having bromide as counter ion showed greater admicellar partitioning coefficients than those having chloride as counter ion.