

## Synergism in mixtures of cationic surfactant and anionic copolymers

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Surface tension measurements have been made in aqueous solutions of anionic hemiesters of an alternating copolymer of maleic acid and styrene, MAS-n with  $n=0-12$ , in the presence of dodecyltrimethylammonium bromide, DTAB. A synergistic aspect of surface tension reduction efficiency was observed for all systems studied. The pseudo-phase separation approach and regular solution approximation have been applied, and the interaction parameter,  $\chi$ , and the mole fraction of DTAB in the adsorbed layer (on a surfactant/repetitive unit basis),  $X$ , were obtained. Negative values of  $\chi$ , ranging from -3 to -11, were calculated. On the other hand, the molar fraction of DTAB varies from 0.52 to 0.26. These results are discussed in terms of hydrophobic effects on the distribution of the aggregates between the interface and the bulk of the solution. The conditions predicted by the model to obtain synergism in the tension reduction efficiency are completely satisfied in all cases. ©

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