POLYMER-SURFACTANT INTERACTIONS IN SOLUTIONS

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Polymers and surfactants are common ingredients in many products, including paints, inks, cosmetics, adhesives and detergent formulations. There is much that is known about the behavior of each of these ingredients separately, but the dynamic interactions between them in a completed formulation are still the subject of intensive research. It is a fact that the efficacy of polymers can be affected by the presence of surfactants, and vice versa. Within this lecture the types of associations of surfactants with synthetic and biopolymers, such as enzymes, in water-based formulations will be presented, and few of the many suitable methods for measuring the degree of interactions between them will be discussed.

Further, a recent research example will be reported. It concerns a boosted catalytic performance of a protease enzyme assisted by soft nonreactor comprised from like-charged surfactant and polyelectrolytes. The proposed mechanism and novel findings concern established unexpected attractive interactions between negatively charged sulfonated surfactants and macromolecules of fully neutralized polyacrylic acid in the presence of multivalent cations. Performing the experiments using miniaturized wash assay in a wide range of the surfactant concentration disclosed that bridging interaction results in the increased local concentration of the surfactant with the polyelectrolytes chain, resulting in the localized micelle formation at bulk concentrations well below CMC.

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