

SURFACTANT-ACTIVATED MICRO-GELS IN MICELLAR SYSTEMS

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Personal Care products such as shampoos and body washes are composed of a network of self-assembled surfactant micelles that provide both cleansing and rheology. In many cases it is necessary to modify the rheology of the network to achieve a yield stress suitable for suspension while maintaining high optical clarity. This is commonly done by adding a polyelectrolyte microgel such as a lightly crosslinked copolymer of ethyl acrylate and methacrylic acid. However, incorporation of alkali-swelling (ASE) microgels results in non-uniform performance as a function of pH restricting the useful applications space. More recently we have developed a new class of non-ionic (non-polyelectrolyte) surfactant-activated microgels (SAM) comprising crosslinked amphiphilic copolymers of alkyl acrylates and hydroxy alkyl esters that display uniform properties versus pH in micellar surfactant systems. We discuss the mechanism of action of these materials as a combination of swelling of individual polymer particles by surfactant micelles and surfactant-mediated interaction of the swollen microgels. We also discuss a novel crosslinking approach (reactive surfactant crosslinking) to maximize swelling and interaction of the microgels in micellar media to achieve higher yield stress and optical clarity compared to core-shell architectures with conventional crosslinking as well as microgel compositional variations to improve fragrance and preservative compatibility.