

Use of Polymeric Surfactants in Emulsion Polymerization

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Polymeric surfactants are gaining increasing importance and their interest arises mainly from their low CMC values and their low diffusion coefficient as compared to classical low molecular weight surfactants.

Two categories of polymeric surfactants were examined :

- α , ω and ω functionalized oligomers
- block- copolymers having hydrophobic and hydrophilic sequences.

The dicarboxy terminated oligomers, with a hydrophobic block of polyester, PMMA or PS, were obtained in a molecular weight range of 1000-6000, either by polycondensation or by free radical polymerization in the presence of thiomaleic acid as chain transfer agent.

Well defined styrenic, acrylic and malonic block copolymers such as PS-PEO or PMMA-PAA were prepared by anionic polymerization.

After the determination of the micellar characteristics of these surfactants, they were used in the preparation of styrenic and acrylic latexes, microlatexes and microgels, either by batch or semi-continuous process.

The main interest for the "hairy latexes" thus obtained in the presence of block copolymer surfactants is that the thickness of the PEO or PAA fringe on the latex surface can be adjusted as a function of the molecular characteristics (molecular weight, composition, structure...) of the block copolymer.

The application possibilities of such surface modified latexes will be illustrated in controlled agglomeration processes of latex, in film formation of acrylic polymers, in the preparation of polymer particles with microvoids which are useful as organic white pigments and for controlled release biomaterials.