WATER-SOLUBLE SG1-BASED MACROALKOXYAMINES FOR THE SYNTHESIS OF AMPHIPHILIC BLOCK COPOLYMERS BY NITROXIDE-MEDIATED POLYMERIZATION IN AQUEOUS DISPERSED MEDIA

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ABSTRACT

The presentation will describe nitroxide-mediated controlled free-radical polymerization (NMP) in aqueous dispersed systems. The system is based on the use of water-soluble macroinitiators with an SG1-based alkoxyamine end-group. These water-soluble polymers with reactive end-group, play the role of initiators and stabilizers upon *in situ* chain extension to form amphiphilic block copolymers that will grow and self-assemble simultaneously in water. This process allows surfactant-free particles to be obtained in a straightforward manner.

In this work, we synthesized new macrolkoxyamines based on sodium methacrylate and various co-monomers. The SG1-mediated copolymerizations of methacrylic acid (MAA) with sodium 4-styrene sulfonate (SS) and with acrylic acid (AA) will be described. To better understand these copolymerizations in solution and anticipate the copolymer compositional microstructures of each water-soluble copolymer, the reactivity ratios were calculated [2]. The living character of P(MMA-*co*-SS)-SG1 and P(MAA-*co*-SS)-SG1 were shown.

The two families of SG1-based macroalkoxyamines, the poly(sodium methacrylate-*co*-sodium 4-styrene sulfonate)-SG1 and poly(sodium methacrylate-*co*-sodium acrylate)-SG1 were used for the emulsion homopolymerization of *n*-butyl acrylate at 120°C and the copolymerization of methyl methacrylate with styrene at 90°C. The macromolecular composition of the so-formed amphiphilic copolymers and the colloidal properties of the particles were characterized.

References:

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