THE USE OF GAMMA IRRADIATION FOR THE POLYMERIZATION AND COPOLYMERIZATION OF LYOTROPIC LIQUID CRYSTALLINE STRUCTURE DIRECTING AGENTS

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ABSTRACT

The fact that long range order occurs in lyotropic liquid crystalline surfactants could provide many possibly interesting material science applications but the inherent instability to variations in temperature as well as environmental conditions of the aggregates has limited their uses. The polymerization of these structures has been investigated to determine the effect on the abilities of the structures as templating[2] agents as well as to provide increased stability.

Gamma radiation of polymerizable surfactants has recently been shown to allow retention of macroscopic order in lyotropic phases for certain surfactants[1]. Conversion is still limited by the structural conformation of the aggregates.

Gamma radiation is particularly useful as its excellent penetration at ambient temperature allows more control in the quiescent conditions.

The objective of this study was the polymerization of the surfactant Sodium Undecenoate in concentrated solution with or without the addition of comonomers and crosslink agents. The phases that were present before and after polymerization were observed using polarized light microscopy. The conversion that was obtained was determined gravimetrically.

The ability of amphiphilic self-assemblies to act as structural direction agents for both single particle and macrostructure synthesis was investigated using the following techniques: particle size analysis, polarized light microscopy, electron microscopy (to examine the morphology).

References:

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