Amphiphilic cycloterpolymers of diallyldimethylammonium chloride, diallyloctadecylammonium chloride, and sulfur dioxide.

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Journal of Applied Polymer Science (2005), 97(3), 1298-1306.

Abstract

A hydrophilic monomer (diallyldimethylammonium chloride), a hydrophobic monomer (diallyloctadecylammonium chloride), and sulfur dioxide are cycloterpolymd. in dimethylsulfoxide using azobisisobutyronitrile as the initiator to afford water-sol. cationic polyelectrolytes having a five-membered cyclic structure on the polymeric backbone. The mol. wts. of the polymers contg. varying amts. of the hydrophobic monomer (0-7.5 mol%) are detd. by light-scattering expts. The soln. properties of the series of cationic polyelectrolytes are studied by viscometric techniques. A polymer concn. (C*HA) of <1 g/dL is required for the manifestation of hydrophobic assocns. in these terpolymers contg. C18 hydrophobic pendants. This is a notable improvement over the C*HA values (ca. 15-17 g/dL) for the assocg. cyclopolymers having a pendant length of C10 to C14. The polymer solns. exhibit a sharp increase in viscosity with increasing polymer concns. in salt-free and salt-added solns. The presence of sodium chloride is shown to enhance the hydrophobic assocn. tremendously.