

[54] PROCESS FOR MAKING MACROMOLECULAR MONOMERS OF POLYLACTONES WITH TERMINAL ACRYLOYL UNSATURATION AND BLOCK COPOLYMERS THEREOF

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[*] Notice: The portion of the term of this patent subsequent to Dec. 13, 2005 has been disclaimed.

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Related U.S. Application Data

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[58] Field of Search 525/408, 412, 415; 528/354, 355, 356, 357; 526/320; 560/183, 185

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[57] ABSTRACT

Preparation of a macromolecular monomer of a lactone having an alpha-beta monoolefinically unsaturated "head" is effected at low temperature with a strong oxonium salt, such as a trialkyloxonium (TAO) hexafluorophosphate catalyst, with essentially no formation of cyclic oligomers and an insignificant amount of diacrylate. Cationic ring-opening polymerization of lactone monomer in conjunction with an unsaturated alcohol (propagator) having an acryloyl or methacryloyl double bond, produces a polylactone macromer having an ethylenic double bond at one end and a hydroxyl group at the other. The polymerization proceeds by polyaddition of the lactone to the OH group which is the propagating species. The macromer so formed allows the preparation of a macromer of block copolymer of the polylactone with a polyether such as epichlorohydrin, using the same TAO catalyst. In such a macromer of block copolymer, the polylactone ester block is next to the double bond, followed by the polyether block. This macromer of block copolymer, in turn, may be copolymerized with commonly available olefinically unsaturated monomers. There is no known method for the preparation of such copolymers with a homomacromer of polylactone, or, a macromer of polylactone-b-polyether. The propagator is a primary or secondary acryloyl or methacryloyl alcohol.

27 Claims, No Drawings