BIODEGRADABLE NANOPOROUS MICROSPHERES

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Abstract- Nanoporous microspheres based on polycaprolactone (PCL), polylactide (PLA) and photodegradable poly(methyl vinyl ketone) (PMVK) were synthesized and characterized. In this study, biodegradable triblock copolymers were first synthesized by ring opening polymerization of lactide followed by RAFT polymerization of methyl vinyl ketone (MVK), and then used to fabricate microsphere by emulsion method. In order to polymerize by RAFT method, macro-CTA (chain transfer agent) was synthesized by reacting carboxylic acid-terminated CTA, S-1-dodecyl-S'-(α,α'-dimethyl-α''-acetic acid) trithiocarbonate (DDMAT) with hydroxyl terminated PLA-PCL-PLA triblock copolymer, and then used for the synthesis of block copolymer with methyl vinyl ketone (MVK). The synthesized block copolymers were characterized by FT-IR, ^{1}H NMR spectroscopies. Gel permeation chromatography (GPC) was used to evaluate molecular weight and molecular weight distribution and monitor photodegradabilities of block copolymers. The morphology of microparticles before and after UV irradiation confirmed by SEM and TEM images showed that spherical microspheres before UV irradiation werechanged to disk-shaped microparticles, owing to collapsing of PMVK moieties by UV irradiation.