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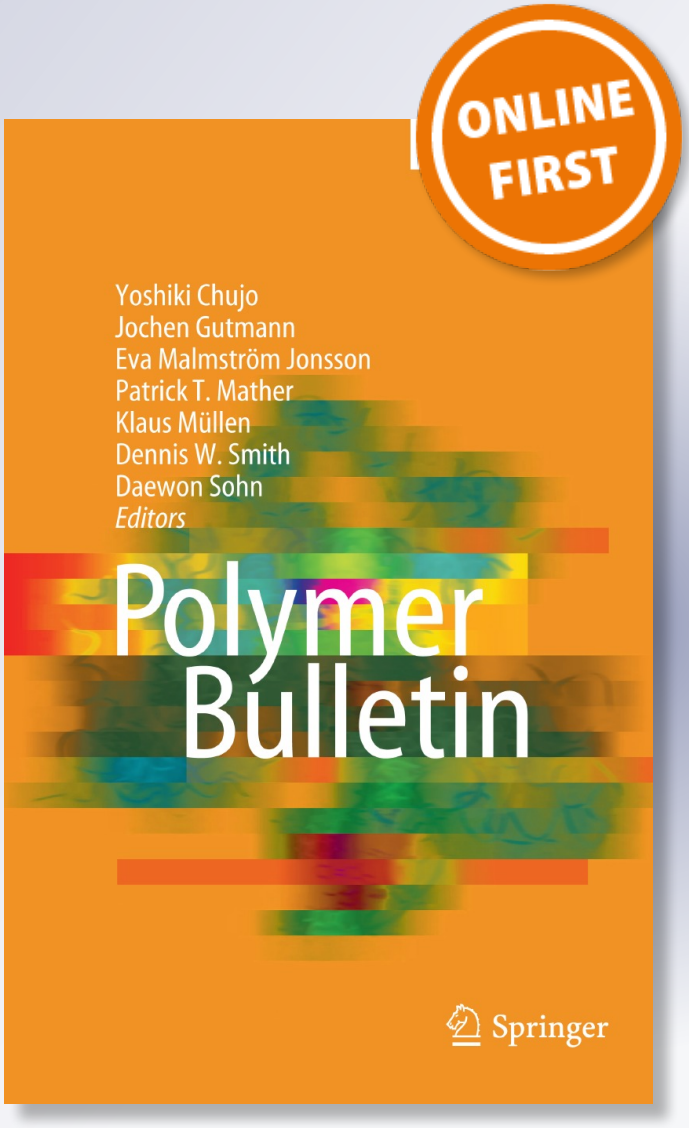

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ORIGINAL PAPER

Synthesis and characterization of hydrogels from template polymerization of acrylic acid on to modified chitosan

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Abstract A novel hydrogel based on chitosan was prepared by graft copolymerization of acrylic acid on diamino derivative of chitosan, i.e., 6-amino-6-deoxy-chitosan (6a6dC). This diamino chitosan was grafted with acrylic acid in an aqueous solution in contrast to acetic acid in the conventional method. Hydrogen peroxide/L-ascorbic acid redox system was found to be an efficient initiator system for grafting reaction in an aqueous system at room temperature. The synthesized hydrogel, 6a6dC-g-PAA, was characterized by Fourier transform infrared, thermogravimetric analyses and Scanning electron microscopy (SEM). Thermal studies showed that it is more stable than chitosan and 6-amino-6-deoxy-chitosan. This 6a6dC-g-PAA, also showed an appreciable water absorbing capacity which was attributed to the very porous surface as observed from SEM analysis.

Keywords 6-Amino-6-deoxy-chitosan · Acrylic acid · H_2O_2/L-ascorbic acid · Hydrogels · Water absorbency

Introduction

Hydrogels are well-known as networks of hydrophilic polymers, which can absorb a significant amount of water (>20 % of their dry mass) without dissolving or losing their structural integrity [1, 2]. Chemically, cross-linked hydrogels were developed in the last few decades as carriers for drugs. The controlled drug delivery devices assure a sustained release and targeted effect [3]. In recent years, the polyacrylic acid (PAA) and its copolymers have been often used as carriers in drug release

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