

Syntheses of New Analogous Polysaccharides to Hyaluronic Acid

Kenichi Hatanaka

Faculty of Bioscience and Biotechnology, Tokyo Institute of Technology

Syntheses of analogous polysaccharides to hyaluronic acid were attempted in order to better understand the relationship between physical and biological properties and the chemical structure.

The polymerizable 1,6-anhydro-2,4-di-*O*-benzyl-3-*O*-1- (methoxycarbonyl) ethyl- β -D-glucopyranose (1) was synthesized by selective benzylation at C-2 and C-4 of 1,6-anhydro- β -D-glucopyranose, followed by 1- (methoxycarbonyl) ethylation with methyl 2-chloropropionate. Polymerization of 1 with phosphorus pentafluoride as initiator in methylene chloride at low temperature under high vacuum gave a stereoregular (1 \rightarrow 6)- α -D-glucopyranan derivative. Copolymerization of 1 and tri-*O*-benzylated monomer gave copolysaccharides having various amounts of carboxylates. The calculated values of monomer reactivity ratios were 0.88 and 0.99 showing the distribution of each monomeric unit in the obtained copolymer was random. Hydrolysis of carboxylate groups was achieved by the reaction with potassium *tert*-butoxide, giving the stereoregular polysaccharide containing the carboxylic acid. However, debenylation of the polysaccharide was unsuccessful.