

PC 6 - Synthesis of Novel Polysaccharides Having Amino Sugar Branches from Cellulose

M. Nagatsuka⁽¹⁾, J. Yang⁽¹⁾, M. Shimojoh⁽²⁾, K. Kurita⁽¹⁾

⁽¹⁾*Department of Materials and Life Science, Seikei University, Musashino-shi, Tokyo 180-8633, Japan*

⁽²⁾*Research and Development Department, Toyo Suisan Kaisha, Ltd., Kohnan, Minato-ku, Tokyo 108-8501, Japan*

Some branched polysaccharides exhibit distinctive properties such as immunoadjuvant and antitumor activities. For example, lentinan, a branched polysaccharide extracted from a mushroom, has β -1,6-glucoside branches on a linear β -1,3-glucan, and it is interesting as an immunoadjuvant. The linear β -1,3-glucan, curdlan, has no such activity, indicating the importance of the branched structure. Cellulose, a β -1,4-glucan, is structurally similar to chitosan, and it is worthwhile to synthesize cellulose-based branched polysaccharides to discuss the structure-property relationship. In order to introduce glucosamine and N-acetylglucosamine branches regioselectively at C-6 of cellulose, a derivative having a reactive group only at C-6 was prepared by a series of reactions: triphenylmethylation at C-6, phenylcarbamylation at C-2 and C-3, detriphenylmethylation, and trimethylsilylation at C-6. Glycosylation of the cellulose derivative with an oxazoline derived from glucosamine resulted in the formation of branched cellulose. The structures of the products were confirmed by IR, ¹H-NMR, and elemental analysis. The degree of substitution of the products could be controlled by the amount of oxazoline. The branched cellulose exhibited high solubility in water.