

Effect of Cellulose Regioselective Substitution on its Graft-copolymerization

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Cellulose is well recognized as a versatile polymer presenting an enormously wide range of material properties by substitution and grafting reactions of its hydroxyl groups. The utilization of combined properties of cellulose and vinyl polymers has been examined using various grafting methods because of their commercial potential. The condensation reactions of regioselective and non-regioselective substitution of 2-isocynoethyl methacrylate were performed in a homogeneous system of DMAC/LiCl. The regioselective substitution was carried out by introducing 4-methoxytrityl group in the C-6 position of anhydroglucose unit and subsequent condensation with methacrylate using dibutyltin dilaurate. The non-regioselective route was carried out without the tritylation. The substituted cellulose derivatives were investigated by FTIR, ¹H NMR, CP/MAS ¹³C NMR, DSC, TGA and XRD. The spectral results of cellulose derivatives confirmed that methacrylate moieties were covalently introduced into cellulose. The properties of substituted celluloses, thermal stability, relaxation and crystallinity were significantly influenced by the substitution. The non-regioselectively substituted cellulose revealed improved thermal stability.