

Sodium Levulinate Cellulose

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Abstract

Cellulose derivatives are widely used bio-based materials with numerous applications in food, pharmaceutical, coatings, cleaning products and textile industries. A new cellulose derivative sodium levulinate cellulose (SLC) was prepared as a longer carbon chain analog for the well known carboxymethyl cellulose (CMC) in 66-94% yield. Derivatization was carried out using the Williamson ether synthesis reaction between sodium hydroxide treated cellulose and brominated levulinic acid in aqueous *iso*-propanol medium under thermal and microwave conditions. Levulinate cellulose ether produced was characterized by FT-IR, TG-DTA, X-ray and proton NMR. The thermal reactions carried out at 90 °C for 3 and 24 h gave SLC products with degree of substitutions of 0.48 and 0.86 respectively, whereas the microwave synthesis product showed a degree of substitution of 0.32 as determined by ASTM D1439-03 method used for CMC.