Effect of structural changes of lignocelluloses material upon pre-treatment using green solvents

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Abstract

The Malaysia Biomass strategy 2020 stated that the key step of biofuel production from biomass lies on the pretreatment process. Conventional pre-treatment methods are 'non-green' and costly. The recent green and cost-effective biomass pretreatment is using new generation of Ionic Liquids also known as Deep Eutectic Solvent (DES). DESs are made of renewable components cheaper, greener and the process synthesis is easier. Thus, the present paper concerns with the preparation of various combination of DES and to study the effects of DES pretreatment on microcrystalline cellulose (MCC), a model substrate. The crystalline structural changes were studied using X-ray Diffraction Methods, Fourier Transformed Infrared Spectroscopy (FTIR) and surface area and pore size analysis. Results showed reduction of crystalline structure of MCC treated with the DESs and increment of surface area and pore size of MCC after pre-treatment process. These results indicated the DES has successfully converted the lignocellulosic material in the form suitable for hydrolysis and conversion to simple sugars. © 2017 Author(s).