

Microwave-Assisted Treatment of Waste Wood Biomass with Deep Eutectic Solvents

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Abstract.

The increasing depletion of fossil feeds and the environmental concerns linked to the use of traditional energy sources have stimulated both academic and industrial worlds in exploiting new sustainable and renewable suppliers of raw materials [1]. In this framework, lignocellulosic biomass can play an important role, acting as the starting material of a biorefinery leading to biofuels, chemicals, and other value-added products, commonly obtained from petroleum. Recently, numerous protocols for processing lignocellulosic biomass of selected plants have been reported. However, developing an environment-friendly method is still a big goal. This challenge becomes more interesting if lignocellulosic biomass coming from wood wastes could be efficiently treated. Deep eutectic solvents (DESs) are new sustainable and cheap reaction media, combining the features of ionic liquids and organic solvents. They are made by association of hydrogen-bond donors and hydrogen-bond acceptors, and they can promote the hydrolysis of lignocellulosic bonds [2]. Herein, we report on the microwave-assisted treatment of waste wood flours with DESs formed by choline chloride and oxalic acid to get a cellulosic residue separated from lignin degradation products, identified by NMR spectroscopy. The insoluble deposit was characterized by SEM, TGA, DSC, FTIR-ATR and ¹³C CP/MAS NMR techniques and could be available for further uses such as nanocellulose production.

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