

Biomass Pretreatment with Ionic Liquids

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Room temperature ionic liquids (ILs) have recently been very popular as green solvents due to their unique physicochemical properties of negligible vapor pressure, non-flammability, excellent thermal stability and a strong ability to dissolve a wide range of organic and inorganic compounds. They also have great potential as reaction media or co-solvent for enzymatic bioconversion including biodiesel production. Cheap glucose from cellulose opens a wide window of opportunities for the production of bioenergy and platform chemicals. Nevertheless, the recalcitrance of cellulose poses a key problem for chemical and biological processes in biorefinery schemes. Dissolving cellulose in ionic liquids, however, helps to overcome the hurdles of the low reactivity of the cellulose fibers resulting in the enhancement of enzymatic saccharification and fermentation. In this presentation, we report an effective pretreatment strategy for cellulosic materials. The ILs-pretreated celluloses become less crystalline and in somewhat condition have lower degree of polymerization (DP) than that of the nature. Moreover, microwave irradiation could cause a significant decrease in DP of cellulose dissolved in ILs which led to a great improvement on cellulase-catalyzed cellulose hydrolysis.