

144. Ionic Liquid Pretreatment: State of Technology and Future Perspective

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Abstract: Lignocellulosic biomass is an abundant renewable feedstock with great geological diversity and availability. There is a great opportunity for the production of various commodities such as biofuels, chemicals and biomaterials. ILs have proven the extraordinary potential in facilitating the fractionation and separation of biomass components. The progress made in last few years have demonstrated that ILs can be successfully used as pretreatment or bioprocessing medium in a biorefinery to obtain cellulose, hemicellulose and lignin fractions from a variety of biomass feedstocks or mixtures with purity and efficiency equal or superior to the currently employed pretreatment methods for the second generation biofuels and biochemical production. The chemistry during IL pretreatment largely depends on the selection of ILs, the processing conditions and recovery methods and ties closely to how the biomass being altered during the process and the pretreatment efficacy. The IL pretreatment technology is evolving very fast and this rapid development is augmented by the development of new ILs, process development, and nature of ILs being a designer solvents. Despite the enormous potential and growth, challenges have to be addressed to make IL pretreatment an economically viable technology in the biorefinery context. This presentation will cover the state of IL pretreatment technology and briefly provide outlook on several different scenarios currently available for feedstock to fuels using IL pretreatment technology via integrated efforts and progress made in different divisions at JBEI.