

Development and screening of one-pot IL conversion technologies

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Project Goal: To assess the capabilities and potential of the “one pot” ionic liquid based [Ch][Lys] configuration for application to different feedstocks.

Certain ionic liquid (ILs) are known to be effective biomass pretreatment solvents that produce high yields of fermentable sugars suitable for the production of biofuels and bioproducts. This poster will cover the discovery and synthesis of new ILs used in new process configurations that reduce the need for solid-liquid separations and water washing of pretreated solids. The development of a "one-pot" system configuration for the integration of pretreatment-saccharification-fermentation unit operations will be a central focus of the poster. This one-pot IL conversion technology is enabled by the use of biocompatible ILs that are not toxic to the enzymes and microbes used in saccharification and fermentation, respectively. The performance of biocompatible ILs, such as the new group of bio-derived cholinium-based ILs is explored in this study. The results provide evidence of the potential of the IL one-pot configuration as a compelling integrated scheme for the deconstruction and conversion of a wide range of lignocellulosic feedstocks. The fundamental understanding generated by this work will contribute to the design and realization of affordable and scalable IL-based biomass conversion technologies.

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