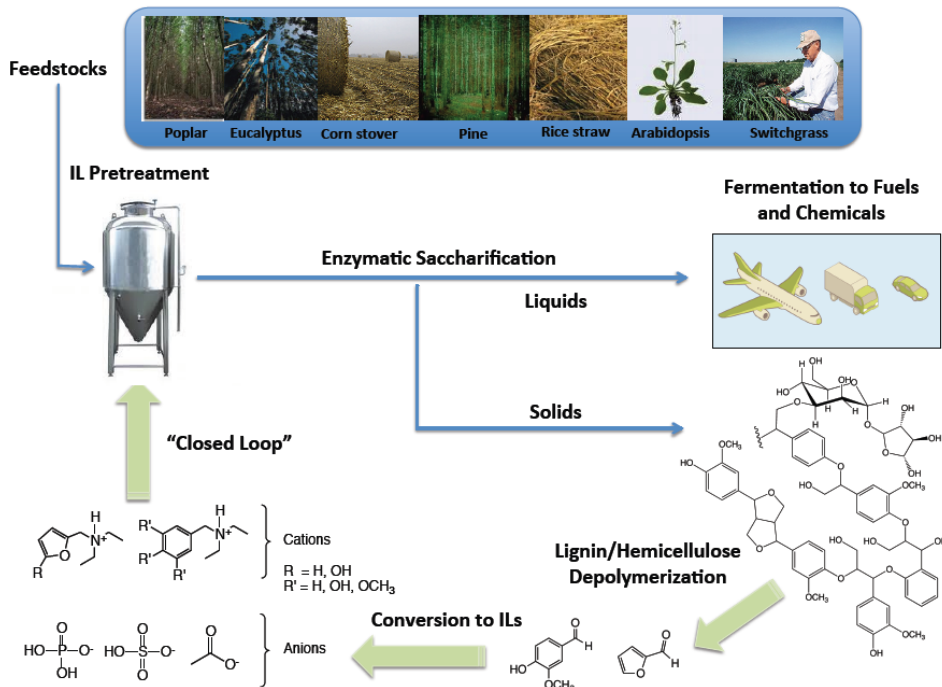


Development and Demonstration of an Integrated Biomass Sugar Production Platform based on Ionic Liquids

Seema Singh, PhD
 Director- Biomass Pretreatment
 Joint BioEnergy Institute CA, USA
 Distinguished Member of the Technical Staff
 Biomass Science and Conversion Technologies Department
 Sandia National Laboratories CA, USA

Currently, biofuels such as ethanol are produced largely from grains, but there is a large, untapped resource (estimated at more than a billion tons per year) of plant biomass that could be utilized as a renewable, domestic source of liquid fuels. Well-established processes convert the starch content of the grain into sugars that can be fermented to ethanol. Plant-derived biomass contains cellulose, which is more difficult to convert to sugars. The development of cost-effective and energy-efficient processes to transform cellulose in biomass into fuels is hampered by significant roadblocks, including the lack of specifically developed energy crops, the difficulty in separating biomass components, low activity of enzymes used to deconstruct biomass, and the inhibitory effect of fuels and processing byproducts on organisms responsible for producing fuels from biomass monomers. The Joint BioEnergy Institute (JBEI) is one of three US Department of Energy Bioenergy Research Centers that is addressing these roadblocks in biofuels production. This talk will present a brief summary of the JBEI organization and research focus at JBEI highlighting the efforts on the development and deployment of novel ionic liquid based pretreatment technologies for biomass pretreatment.



Hypothetical process flow for a "closed-loop" bio-refinery using efficient renewable ionic liquids derived from lignocellulosic biomass.