The development of alternative solvents for processing woody biomass is vitally important for meeting the growing need for renewable material sources. Over the past decade, there has been an increased focus on ionic liquids, which are organic salts with unique physical and chemical properties. Ionic liquids are attractive solvents, having high dissolving power over the constituent components of lignocellulosic biomass, including cellulose, lignin, and hemicelluloses. These exceptional properties do not come without drawbacks; in particular, they tend to have high viscosities which can only be mitigated via mixing with cosolvents. In this research we have explored mixtures of imidazolium-based ionic liquids with traditional solvents (like ethanol), with the traditional solvents being the major component of the mixtures. Our investigations have further focused on processing at elevated temperatures and pressures to further improve the solvation power of the mixtures.

This seminar will focus on the interactions between woody biomass and pressurized solvents modified with ionic liquids under a variety of conditions in a specially designed high-pressure cell. Thermal stability is an important factor to consider when using such mixtures as process solvents. The stability of the selected ionic liquids was assessed through both traditional thermogravimetric analysis and a novel UV-Vis spectroscopy technique that allows for in situ observations over time at elevated temperatures and pressures.