MECHANOCHEMISTRY FOR THE DEPOLYMERIZATION OF LIGNIN AND THE SYNTHESIS OF TANTALATES **Richard G. Blair** Department of Chemistry and The National Center for Forensic Science, University of Central Florida, Orlando, FL, 32816.

Mechanochemistry and mechanocatalysis allow the rapid synthesis of an array of compounds at nominally ambient conditions. In order to expand this approach beyond application to individual reactions, a thorough understanding of the reaction environment is needed. Mechanochemistry requires knowledge of mechanical factors and well as chemical reactivity. Through the implementation of discrete element models and experiments we have found that, contrary to common opinion, high-pressures and low-temperatures (<100˚C) are realized during milling. These unique conditions allow us to access a poorly explored section of the pressure/temperature parameter space. We have had success in the depolymerization of lignin, and the synthesis of tantalate catalyst supports will be presented. The products will facilitate the production of fuels and chemicals from biomass and solar energy.