Moving Ionic Liquid Chemistry into the Solid Phase

My research group has been exploring the analytical applications of room-temperature ionic liquids (RTILs) for several years. More recently, we have extended the range of these materials to include analytical applications of similar solid materials, i.e. organic salts with melting points of solid ionic liquids (25 °C to 100 °C) up to melting points of 250 °C. To contrast these new materials with RTILs, we have created the acronym, GUMBOS (Group of Uniform Materials Based on Organic Salts). These GUMBOS have the tunable properties frequently associated with RTILs, including tunable solubility, melting point, viscosity, thermal stability, and functionality. Thus, when taken in aggregate, these properties allow production of solid-phase materials that have a wide range of applications in broad areas of the sciences. In this talk, I will...
highlight the applications of GUMBOS which we have recently explored in the sciences, including GUMBOS as sensors, imaging agents, stimuli-responsive materials, cancer therapy, energy applications, and for production of nanoGUMBOS. In regard to nanoGUMBOS, we believe that our methodology represents an extremely useful approach to production of nanomaterials since our materials are designed and assembled for specific uses, rather than adapted for use as is done for many nanomaterials. Selected applications, including sensor and energy applications will be highlighted in this talk.