



## **Ionic Liquid Extractions of Soil Organic Matter**

Antonio Patti (1,2), Douglas MacFarlane (1,3), and Michael Clarke (1)

(1) Monash University, Centre for Green Chemistry, Faculty of Science, Clayton, Australia (tony.patti@sci.monash.edu.au),

(2) School of Applied Sciences and Engineering, Monash University, Churchill, Vic. 3842, Australia, (3) School of Chemistry, Monash University, Wellington Rd, Clayton, VIC 3800, Australia

A large range of ionic liquids with the ability to dissolve different classes of natural biopolymers (e.g. cellulose, lignin, protein) have been reported in the literature. These have the potential to isolate different fractions of soil organic matter, thus yielding novel information that is not available through other extraction procedures. The ionic liquids dimethylammonium dimethylcarbamate (DIMCARB), alkylbenzenesulfonate and 1-butyl-3-methylimidazolium chloride (Bmim Cl) can solubilise selected components of soil organic matter. Soil extractions with these materials showed that the organic matter recovered showed chemical properties that were consistent with humic substances. These extracts had a slightly different organic composition than the humic acids extracted using the traditional International Humic Substances Society (IHSS) method. The ionic liquids also solubilised some inorganic matter from the soil. Humic acids recovered with alkali were also partially soluble in the ionic liquids. DIMCARB appeared to chemically interfere with organic extract, increasing the level of nitrogen in the sample. It was concluded that the ionic liquid Bmim Cl may function as a useful solvent for SOM, and may be used to recover organic matter of a different character to that obtained with alkali