

Electrospray Mass Spectrometry of Room Temperature Ion Liquids

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Room temperature ionic liquids (RTILs) are a new class of solvents that are thought to hold much promise for green chemistry applications. However RTILs, composed of an organic cation and an organic or inorganic anion, have unusual properties (such as a negligible vapor pressure) that make them difficult to analyze using conventional mass spectrometric techniques. Dyson et al. first demonstrated the ability to analyze charged Ru catalysts within RTILs following dilution using electrospray mass spectrometry (ES-MS).¹ We have found that direct ES-MS of *undiluted* RTILs results in similar limits of detection ($\sim 10^{-5}$ M) to traditionally diluted samples.² The ability to analyze components dissolved within RTILs is found to be beneficial in the reduction of adduct ion formation and for the preservation of reactive analytes. Quantitative analysis has been performed on both aqueous and ionic liquid phases of liquid-liquid extractions in which the ability to quantify both extractants in RTIL phase and the extent of back-extraction is demonstrated for both diluted and undiluted samples. Additionally, novel approaches to enhance ion production of dissolved analytes and will be presented.

References

¹ P.J. Dyson, J.S. McIndoe, D. Zhao, *Chem. Commun.* 4 (2003) 508 - 509

² G.P. Jackson and D.C. Duckworth, *Chem. Commun.* 5 (2004) 522 - 523

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