

## **Ionic Liquids and Electrochemistry: from Proteins to Electrochromic Devices.**

T Mark McCleskey, Anthony Burrell, Sheila Baker, Gary Baker, Benjamin Warner, Simon Hall

Los Alamos National Laboratory  
MS J514, Los Alamos, NM 87544

Anzode Inc.  
Massey Anzode Research Centre  
IFS, Massey University  
Palmerston North 11 222  
New Zealand

We will report on a wide range of activities within the chemistry division at Los Alamos National Laboratory. Results on basic and applied research involving electrochemistry will be discussed. Topics will include electrochemistry of proteins, sensors based on electrochemical signals, temperature sensors, electrochromic devices in ionic liquids and the characterization of organic cation radicals.

We have recently developed several applications in ionic liquids that include electrochromic devices, temperature sensors and chemical sensors. The electrochromic windows are being marketed as self-tinting automotive mirrors. The ionic liquid based temperature sensor is stable and accurate over a wide range and has the potential to provide high-resolution temperature imaging. Chemical sensors have been developed that use electrochemistry to detect low levels of potential chemical agents in air.

We have also studied the basic chemistry of charge transfer complexes and proteins in ionic liquids. Charge transfer complexes display unique behavior in ionic liquid compare to traditional solvents. Proteins can be solubilized at high levels that make it possible to probe electrochemistry in the proper ionic liquid.