

VOLTAMMETRIC MEASUREMENTS IN A ROOM TEMPERATURE IONIC LIQUID USING SCANNING ELECTROCHEMICAL CELL MICROSCOPY. **Joshua C. Byers**, Samaneh Salek, Département de Chimie, Université du Québec à Montréal, Montréal, Québec, Canada. (byers.joshua@uqam.ca)

Scanning electrochemical cell microscopy (SECCM) uses a pipet probe to form a tiny meniscus droplet cell to carry out highly sensitive electrochemical measurements with high spatial resolution[1]. Room temperature ionic liquids (RTILs) have high viscosities and low vapour pressures compared to conventional solvents enabling the formation of a highly stable droplet at the end of a SECCM pipet probe [2]. The mass transport of a redox mediator in a RTIL is highly influenced by solvent viscosity which impacts its diffusion coefficient, and ultimately the voltametric response. While microelectrodes have been used to carry out voltametric measurements in RTILs and achieve a steady state response, this has not been explored in detail using SECCM. In this work, we will present our results that explore the effect of the pipet diameter, which influences the rate of mass transport, for a ferrocene redox mediator in the RTIL 1-butyl-3-methylimidazolium tetrafluoroborate to evaluate the conditions where a steady-state response can be achieved to enable the determination of the diffusion coefficient and heterogeneous rate constant at a glassy carbon substrate.

1. Bentley, C.L., et al. *Analytical Chemistry*, 2019. **91**(1): p. 84-108.
2. Bentley, C.L., M. Kang, and P.R. Unwin. *Analytical Chemistry*, 2020. **92**(17): p. 11673-11680.