

EXPLORING NEW ELECTRODES AND CHANNEL CELL DESIGNS FOR ELECTROANALYTICAL STUDIES UNDER HYDROTHERMAL CONDITIONS. **Liliana Trevani**¹, Muna Abdulaziz¹, Tony George¹, Germán Sciaini². ¹Ontario Tech University, Faculty of Science, 2000 Simcoe St North, Oshawa (L1G 0C5), ON, Canada; ²University of Waterloo, Department of Chemistry, 200 University Ave W, Waterloo (N2L3G1), ON, Canada. (liliana.trevani@ontariotechu.ca)

Electroanalytical methods have been extensively used for chemical analysis and mechanistic studies of complex redox processes for various applications [1]. However, most techniques were developed for studies at relatively low temperatures and pressures (T, p). Electrochemical studies under hydrothermal conditions remain uncommon, mainly due to the need for relatively complex pressurized systems [2]. For analytical studies, high T, p flow cells, particularly channel flow cells (CFC), are advantageous for multisampling analysis and compatible with spectroscopic methods for operando studies [3]. In this presentation, I will describe a new high-temperature CFC design for electrochemical studies in pressurized aqueous systems and the problems found while constructing and evaluating the first prototype. Along with the cell, the project involved the development of Pt thin-film electrodes and numerical simulations that were used to gain insight into crucial cell parameters required for optimizing the system. These aspects will also be discussed in the presentation.

[1] E. Tanner, R. Compton, *Electroanalysis*, 2018, 30, 1336 – 1341.

[2] V. Balashov, M. Fedkin, S. Lvov., *J. Electrochem. Soc.*, 2009 156(7), C209.

[3] H. Wang, E. Rus, H. Abruña, *Anal. Chem.* 2010, 82:4319-24.