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SEMINAR

“Impedance spectroscopy basics and its application to battery research”

Dr. Sara Drvarič Talian

Kemijski Inštitut - National Institute of Chemistry

Ljubljana, Slovenia

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15:30

Room 7, Department of Chemical, Physical, Mathematical and Natural Sciences, Via Vienna 2, Sassari

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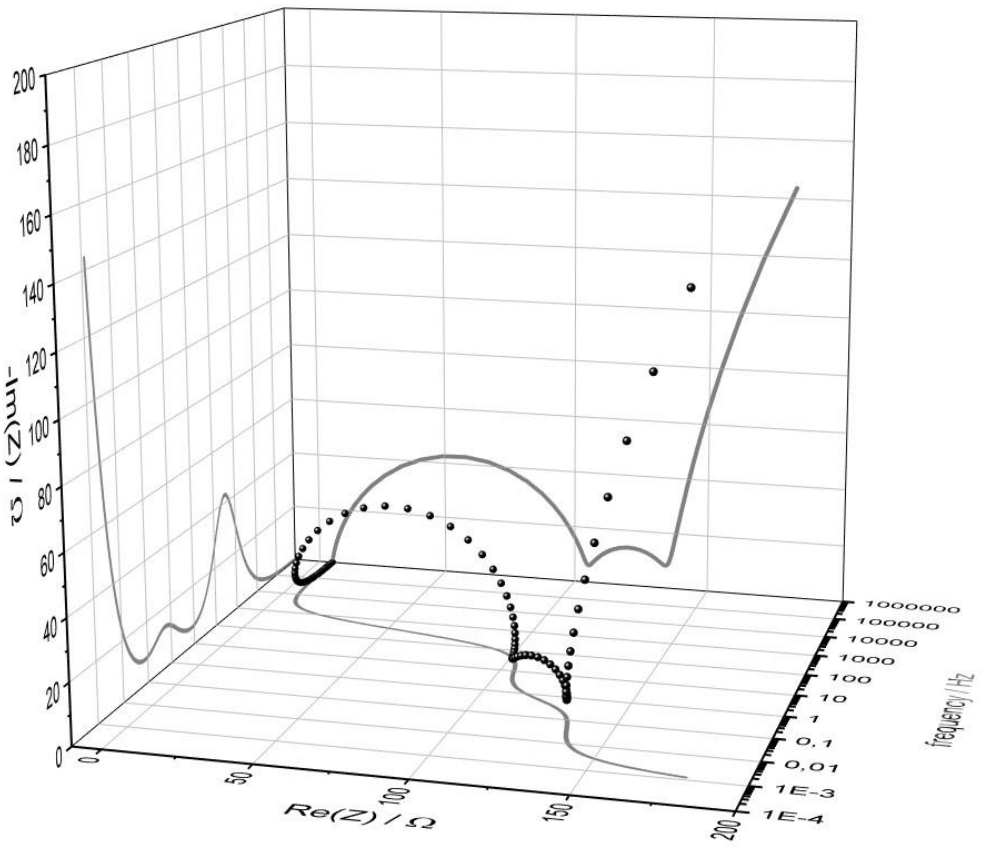
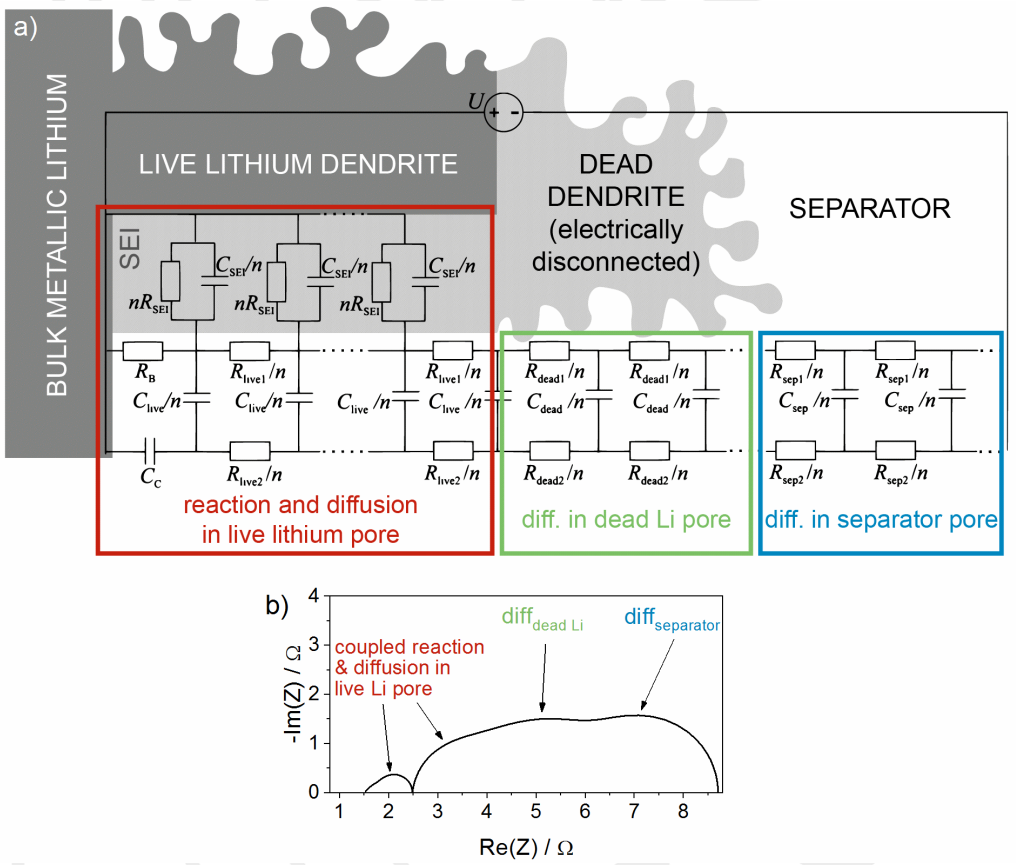
Impedance spectroscopy is a powerful experimental technique that can be used to assess the physico-chemical processes taking place inside an electrochemical cell and evaluate the internal losses stemming from them. It is also uniquely suited for differentiating between processes based on their time scale, allowing for separation of migration, diffusion and charge transfer reaction resistances. The seminar will discuss the principles of impedance spectroscopy and best practices for measurements and data processing. The presented guidelines will be general in the sense that they can lead to reliable and valuable impedance spectroscopy experiments for most electrochemical systems.



In typical battery configurations, all components contribute to the impedance response of the whole cell and the overlap of the many different contributions often results in a complex impedance spectroscopy experimental curve that is not easily interpreted. A few spectra, even if obtained through well-designed experiments, are not sufficient to decouple the various parallel phenomena and draw meaningful conclusions. Therefore, special model experiments, other complementary (electro)chemical analyzes, or modeling of impedance spectra are required. In the seminar, pitfalls and opportunities of the application of impedance spectroscopy to several different battery systems will be discussed.



Contacts: fmurgia@uniss.it, sara.drvarictalian@ki.si