

## Physical Methods in Inorganic Chemistry

Electrochemistry/Cyclic Voltammetry – Dr. D.G.H. Hetterscheid

Cyclic Voltammetry is an important electrochemical technique to characterize redox active molecules. It allows you to obtain relevant thermodynamic parameters such as the redox potentials of the molecules directly. And given that the electron flow through the electrodes (current) is recorded during the experiment, it allows you to obtain useful kinetic data as well. However electrochemistry comes with its own language and experimental difficulties, while the actual redox reactions only occur in very close proximity to the electrodes. All of this makes it difficult to understand what is going on in a cyclic voltammetry plot exactly at a first glance.

This lecture aims at students that are not (too) familiar with cyclic voltammetry and other electrochemical techniques and are planning to do such experiments in the future, or want to be able to read and critically assess papers containing electrochemical data. The lecture will include the following:

- A thorough background of all events happening during a cyclic voltammetry experiment.
- Instructions how to properly prepare electrodes, glasswork, and electrolyte solutions, how to carry out cyclic voltammetry experiments, and why all of these steps are necessary.
- Handles that allow the student to interpret cyclic voltammetry data, and to pinpoint what electrochemically (triggered) reactions are actually taking place in their reaction flask.

In addition a few related techniques will be discussed such as rotating (ring) disk voltammetry, differential pulse voltammetry and spectroelectrochemistry, allowing to student to obtain additional information from an electrochemistry experiment.