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Master Thesis

available in the field of

Electrochemical Energy Storage in Hybrid Capacitors

within the FWF-funded Lise Meitner-Project

Electrified Carbon/Iodide Interface for Hybrid Capacitors

Context: Hybrid electrochemical capacitors are energy storage devices, where one electrode works battery-like (driven by the reactions of redox-active species), whereas the other electrode stores charge in the electric double layer (EDL). Because of these different charge storage mechanisms at the two electrodes, the cell or device is called a hybrid. Thanks to the EDL capacitive charging of one electrode, the hybrid capacitors exhibit high specific power while maintaining high energy owing to the hybridization of the electrodes.

Objectives: Laboratory-scale symmetric and hybrid cells will be assembled and their cycling behavior studied. The student will investigate the charge storage mechanisms at the battery-like and capacitor-like electrodes (both made from activated carbon) with electrochemical and spectroscopic methods as well as thermogravimetric analyses.