

Abstract of Presentation at PSI:

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31th August 2008

Young Graduate Trainee at ESA-ESTEC:

Measurement of electrode EMFs of new and cycled sony 18650HC lithium ion cells

In battery modelling especially of old cycled cells, single electrode potentials are an important input parameter. During the project at ESA a method to measure single electrode potentials in new and old commercial Li-cells (Sony 18650HC) was developed and measurements were carried out to improve the in house battery model.

A hole was drilled into the cell to access with a micro reference electrode the space in the middle of the cell. A copper wire was inserted into the cell and in-situ plated with Li-metal to get a stable reference electrode. With a daily replating electrodes stable for some month were achieved with a stability of about $\pm 5\text{mV}$.

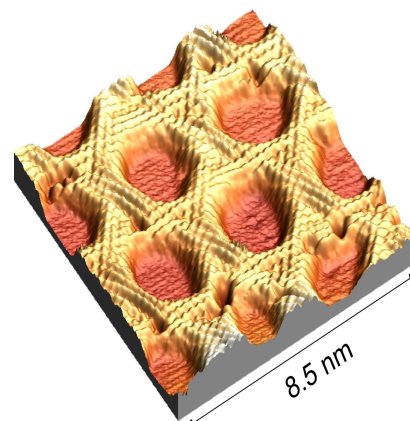
To measure single electrode potentials in equilibrium C/200, C/500 and stepwise cycles were carried out. C/200 cycles yield to the best results concerning accuracy and time consumption. Cycles with new and old cells to different state of charge were carried out and the results were compared. The results were inserted into the in house battery model to refine its results.

Master Thesis at EMPA Thun:

Electrochemical and UHV Investigations of the h-BN Nanomesh surface

The boron nitride nanomesh consists of a single layer hexagonal-boron-nitride (h-BN), which is formed by a CVD process of borazine on a hot Rh(111) surface in UHV. The h-BN surface is highly corrugated with a corrugation of 0.05nm and a pore to pore distance of 3.2nm

Side selective adsorption of molecules has been observed in UHV (1) The transfer from UHV to electrolytes was tried by adsorbing copper phthalocyanine onto the Nanomesh



*UHV LT-STM image of the h-BN nanomesh with atomic resolution of the "wires"
[Empa Thun Abt127]*

[1] S. Berner, M. Corso et al. (2007). "Boron Nitride Nanomesh: Functionality from a Corrugated Monolayer", *Angew. Chem. Int. Ed.* 46: 5115-5119.