



Announcement

Theory of electrochemical energy storage

PD Dr. Birger Horstmann

Description

In the first part of this course, the fundamentals of theory-based modelling of electrochemical energy storage devices are taught. The theory is developed based on the fundamentals of thermodynamics, further knowledge of chemistry is not required. The modelling of electrochemical cells from a few atoms to the whole cell is shown. The processes in these systems are mainly investigated with partial differential equations, also called continuum modelling. The goal is the theory-based understanding of electrochemical energy stores, e.g. batteries, fuel cells, supercaps.

In the second part of the course, the participants give presentations on selected topics of current research. The topics range from basic research on processes at electrochemical interfaces to the applied development of new energy storage systems. Students practice typical presentation techniques, which generally help in the preparation of talks.

Content

Fundamentals and current problems of theory-based modelling of electrochemical energy storage devices

Prerequisites

Basic knowledge of thermodynamics

Additional information

Grades are given based on student's seminars.

Credits: 3 ECTS

Lecturer

PD Dr. Birger Horstmann, Electrochemical Multiphysics Modelling, Helmholtz Institute Ulm