

Thermal runaway of lithium batteries: High-temperature properties of cells and electrodes (additional support for Europe)

Initiative: Modellierung und Simulation komplexer Systeme (beendet)

Ausschreibung: Extremereignisse: Modellierung, Analyse und Vorhersage

Bewilligung: 13.07.2014

Laufzeit: 1 Jahre

The thermal runaway of lithium batteries is an outstanding example for an extreme event in a complex technical system. Thermal runaway refers to the ignition or explosion of a battery as consequence of a self-accelerating heating process that is initiated by stochastically-occurring internal or external triggers. The objective of the running base project is to understand, predict and control thermal runaway in lithium batteries by a combined methodology of multi-scale deterministic modeling, stochastic simulation, and experimental analyses. The development of runaway models requires data on the thermodynamics and reaction kinetics of decomposition processes occurring at high temperature (100 to 300 °C). During the course of the base project it turned out, that only scarce data is available in literature. This European add-on project's aim is to generate experimental data on cell and electrode behavior at high temperatures. The Spanish partner IK4-CIDETEC has the experimental capabilities and long-term experience in generating these data. The results will be used in the running project.

Projektbeteiligte

Prof. Dr. Wolfgang Georg Bessler

Hochschule Offenburg
Fakultät Maschinenbau und Verfahrenstechnik
Institut für Energiesystemtechnik
Offenburg

Dr. Oscar Miguel Crespo

CIDETEC - Centro de
Tecnologías Electroquímicas
IK4 Research Alliance
Parque Científico y Tecnológico de Gipuzkoa
Donostia-San Sebastián
Spanien

