

CELEST Member Short Profile



Ulrike Krewer



Ulrike Krewer is full Professor and head of the Institute for Applied Materials – Electrochemical Technologies at Karlsruhe Institute of Technology. After studying chemical engineering, she turned towards electrochemical (energy) engineering. She has more than 20 years research experience on electrochemical cells, including research as full professor at KIT and TU Braunschweig, at Samsung (Korea), MIT and as head of an Otto-Hahn group at the Max Planck Institute in Magdeburg. Her expertise covers established battery, fuel cell and electrolysis technologies, such as Li-ion batteries and PEM electrolysis, as well as a number of exploratory cells such as Li/Na-metal or solid-state batteries, AEM fuel cell, and CO₂ electrolysis. Using especially modeling from surface to cell level and dynamic analysis, she reveals performance limiting steps and the (degradation) state of cells and electrodes, and uses the models to optimise cell design and operation. For her research she got numerous awards; she is in the board of numerous conferences (EFCF, Battery Power, ISE conferences...), elected regional representative of the International Society of Electrochemistry and member of several advisory boards such as “Battery Research Germany”, “Baybatt”, ProcessNet subdivision reaction engineering and EFZN.

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Research areas

- Li- and Na-based batteries, low temperature fuel cells, water and CO₂ electrolysis
- Electrode kinetics, degradation, reaction-transport interaction, electrode design
- Model-based analysis of processes from electrode surface to cell level using continuum and kinetic Monte Carlo methods
- Dynamic analysis methods such as impedance spectroscopy, nonlinear frequency response analysis, CV, step responses
- Operando product and intermediate analysis

Lab equipment (at campus south of KIT)

Potentiostats (with EIS and NFRA functionality), rotating (ring) disc electrodes, online electrochemical mass spectrometry, UV-Vis- and IR spectrometry, GC-MS, HPLC, ATR-SEIRAS, FIB-SEM, μ -CT, light microscopes, XRD
Test facilities for battery cells, fuel cells and electrolysis cells

Ulrike Krewer @ IAM-ET

https://www.iam.kit.edu/et/mitarbeiter_5189.php

Link IAM-ET

<https://www.iam.kit.edu/et/>

Link lab equipment

<https://www.iam.kit.edu/et/5981.php>

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