



## Mechanistic Understanding of Electrochemical and Chemical Reactions in Batteries with Operando and In-Situ Methods

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### Message from the Guest Editor

This Special Issue on operando and in situ analysis of batteries focuses on elucidating chemical and electrochemical reaction mechanisms in different battery concepts. For a better understanding of the internal processes and a knowledge-based approach to material improvement, in situ and operando methods are particularly suitable. These measurements, when properly applied, can very well resolve the complex reactions and help trigger new material synthesis routes for battery performance improvement.

In this issue, several studies will be published on the analysis of half or full cells using operando or in situ methods to provide insights into cell chemistry and degradation mechanisms.

Potential methods and their combinations (multimodal) include but are not limited to:

- X-ray diffraction
- Small-angle X-ray scattering
- X-ray imaging
- X-ray absorption spectroscopy
- X-ray photon spectroscopy
- Impedance spectroscopy
- Raman spectroscopy
- Infrared spectroscopy
- UV/vis spectroscopy

Potential battery concepts or electrodes include but are not limited to:

# Special Issue



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# batteri



- Metal/sulfur batteries
- Alloying anodes such as silicon, tin, germanium, etc.
- Redox flow batteries

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