

Operando Temperature Dynamic Investigation of Electric Double-Layer Capacitors Containing Organic Electrolytes



Fabian Alexander Kreth



Dr. Lukas Köps



Prof. Dr. Scott Donne



Prof. Dr. Andrea Balducci

Invited for this month's cover picture is the Balducci's group who works on the development of innovative electrolytes and materials for safer, high-performance supercapacitors and batteries, and on advanced real-time characterization techniques to improve the understanding of aging and charge storage processes in electrochemical devices. The front cover illustrates a supercapacitor evaluated with the screening technique presented in this report. It highlights different electrolyte compositions, indicated by chemical compounds above the setup. This approach provides insights into how capacitance, energy, power, entropy, and enthalpy respond to changes in temperature and voltage. Read the full text of the Research Article at 10.1002/batt.202300581.

What prompted you to investigate this topic?

Identifying the optimal operating conditions for supercapacitors traditionally required extensive, time-consuming investigations. Our goal was to develop a swift screening method that allows for a comprehensive analysis of numerous performance parameters across a range of temperatures and cell voltages, streamlining the research process significantly.

What is the most significant result of this study?

The technique efficiently assesses devices under demanding conditions without harming cell integrity, providing insights into performance and thermodynamic parameters, such as capacitance, energy, power, enthalpy, and entropy.

What future opportunities do you see for the presented screening technique?

This technique enables easy comparison of the influence of various cell components, which shows great potential to be implemented as a routine screening process in research and development.

Batteries & Supercaps

Front Cover:
F. A. Kreth and co-workers
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