Cover Profile
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Ragone Plots for Electrochemical Double-Layer Capacitors

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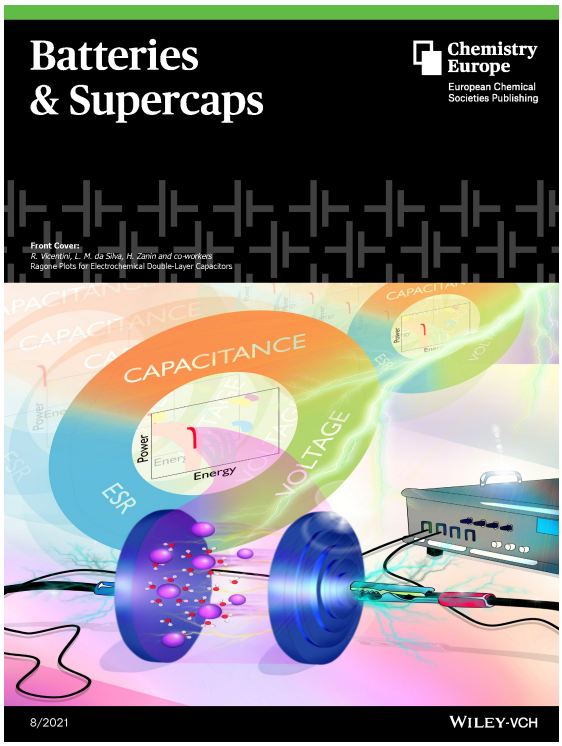
Invited for this month's cover picture is the group of advanced energy storage division of Center for Innovation on New Energies (CINE). The Front Cover illustrates how to correctly determine the Ragone plot of electrochemical double-layer capacitors (EDLCs). A rational and standard guide is presented to obtain reliable plots, which contribute to represent the true advances in the study of energy storage devices. Read the full text of the Concept at 10.1002/batt.202100093.

What is the most significant result of this study?

The most significant contribution of this work is adjusting wrongdoing present in the literature concerning how to plot Ragone data, as well as how to determine the working voltage window (WVW), capacitance, energy, and power for electrochemical double-layer capacitors (EDLCs) and supercapacitors. Our work gives the key components and a proper electrochemical method to plot the Ragone data correctly.

What prompted you to investigate this topic/problem?

The authors realized there were different methods to evaluate power and energy concerning supercapacitors and their parameters, leading to inconsistent results. To provide reliable and standard methods, with the help of technological resources for accurate analysis, the authors offer a standard electrochemical method, which should help establish best practices for data acquisition for supercapacitors.



What new scientific questions/problems does this work raise?

The future questions that could surge from this work could be: "Is there an upcoming unified method for evaluation of supercapacitors' performance?", or "Are there people concerning about these standardization patterns?, and "What are they trying to bring forward in terms of standards of evaluation performance?".

How did each team member/collaborator contribute to the work?

The team is composed of physicists, chemists, and engineers. The contributions of each member were crucial to developing this work. Physicists contributed by analyzing the equations and phenomena around the supercapacitors issues. Chemists helped by checking the electrochemical behavior of supercapacitors with their background knowledge on electrochemistry and electrochemical characterizations. Engineers collaborated by developing setups and precise measurements of devices.