Cover Profile
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The Sound of Batteries: An Operando Acoustic Emission Study of the $LiNiO_2$ Cathode in Li–Ion Cells


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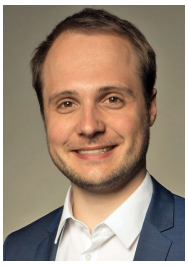
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Invited for this month's cover picture is the group of Jürgen Janek at KIT. The cover picture shows that acoustic emission is a promising technique that allows degradation of battery materials such as particle fracture to be probed in a non-destructive manner. Read the full text of the Article at 10.1002/batt.202000099.

What is the most significant result of this study?

Our study indicates that acoustic emission is not only a valuable technique for monitoring fatigue and crack formation in construction materials, but also for probing electrode degradation and adverse side reactions in battery cells. It provides complementary information on surface film formation as well as structural and (chemo)mechanical effects.

What prompted you to investigate this topic/problem?

Degradation of electrode materials during electrochemical cycling negatively affects the longevity of rechargeable battery cells. Hence, it is important to understand ageing and failure modes, which ultimately allows to improve on the performance and stability. Operando acoustic emission offers the possibility of probing electrode materials in real-time in a non-destructive manner and thus may help build better batteries by improving knowledge on reaction mechanisms and degradation processes.

What aspects of this project do you find most exciting?

The most exciting and at the same time most challenging aspects of this project were to find out what kind of degradation can be monitored by acoustic emission and the data interpretation itself, due to the complexity of the acoustic information.