Electrochemical Energy Storage

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Abstract

With the US and China the leading producers of greenhouse gases, alternatives to fossil fuel-based power generation and transportation will become increasingly important. Electrochemical energy storage will play a major role in future transportation, grid-scale storage, and home storage applications. Additionally, the balance between manufacturing, safety, cost, and durability will become important. As electrochemical energy storage devices become more ubiquitous, the end-of-life issues must also be considered, since these can also have significant economic and environmental impact.

This session will provide an overview of several key topics in energy storage. Our first speaker, Yi Cui (Stanford University), will discuss how nanomaterials have enabled unprecedented advances in battery science and technology. Next, Yangxing Li (Huawei Technologies) will discuss how fundamental research has enabled the design of novel high-performance materials from the bottom up, which leads to superior performance for lithium-ion batteries. The third speaker, Fang Wang (China Automotive Technology and Research Center), will discuss the coupling of battery thermal-electrochemical characteristics, including heat-generating characteristics, boundary evaluation-thermal runaway, system propagation, and thermal stability throughout the life of the battery. The final speaker, Gabrielle Gaustad (Rochester Institute of Technology), will cover end-of-life and recycling issues related to energy storage devices from a sustainability perspective.