

**Modeling of Batteries for
Performance and Failure Mechanisms**

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This talk reviews developments in the quantitative understanding of electrochemical storage systems from the points of view of both performance modeling of energy and power and analysis of failure mechanisms which lead to degradation of performance and end of life.

Included will be discharge and charge of full-cell models as well as simpler approaches which capture limiting behavior and enhance understanding of physical and chemical processes.

Failure mechanisms are less broad than performance modeling and need to be tailored to specific systems and problems. Mention can be made of

1. Zinc shape change.
2. Dendrite formation in Zn, Ag, and Li.
3. Imbalance of cells and overcharge protection.
4. Side reactions.