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Session I

Recent Advances: Safety Perspective

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Lithium dendrite formation in Li-ion and Li-S batteries

Lithium plating or formation of lithium dendrites is a common phenomenon in current lithium-ion and future lithium metal batteries. It causes an internal short circuit and creating a risky situation during the operation of such cells for sensitive operations. Several questions persist in the literature like the starting point of lithium plating, wherein the graphite anode, growth mechanism, and how far this irregular plating is allowed for a safe operation, etc. Understanding all of these in greater depth and create a decipherable strategy could be the way forward to the current high-energy lithium-ion battery based on graphite anode. Similarly, the future of metal anode-based battery technology strongly depends on the improved strategy of dendrite prevention and its utilization on large scale and it directly determines the scale of the safety of the future battery technologies.

About the speaker

Dr. Sagar Mitra is a Professor in the Department of Energy Science and Engineering, IIT Bombay. Prof. Mitra's research interests include developing new electrochemical storage technology, electrode design, characterization, and modeling of electrode materials for lithium, sodium, and metal sulfur battery. He is currently leading the battery research team in the National Centre for Solar Photovoltaic Research and Education-Phase I and Phase II (funded by the ministry of new and renewable energy, Govt. of India). His research group is actively participating in commercial-grade lithium-ion battery prototype development and working with several industry partners. He has authored 117 peer reviewed publications with ~ 5841 citations and has 25 patents filed in battery active materials and fabrication process.

