17 November 2025 SSM 104

MATERIALS AND BIOMATERIALS SCIENCE AND ENGINEERING

Lithium-Ion Battery Characterization and Failure Analysis

ABSTRACT

Lithium-ion batteries have become an integral part of our lives. From the explosion in EV adoption to wide-spread use in millions of cell phones, they are enablers of electrification. Why lithium and what are the principles of the battery operation? What materials aspects are well-understood and what are the mysteries? What are the failure modes? I will discuss key characteristics and focus on electrical (ICA) and electrochemical characterization (EIS) of Li-ion batteries from the R&D perspective for failure analysis and battery degradation. Then I will cover the new trends, the challenges, and opportunities for research.

BIOGRAPHY

Ali Emamjomeh is a Senior Staff Engineer at Lytx working on reliability improvements of Li-ion batteries in industrial dashcams. Ali also holds a Research Associate position with UC Merced.

He received his bachelor's in Mechanical Engineering from California State University, Fresno and Masters in Engineering Mechanics from Santa Clara University as well as Masters in Materials Science & Engineering from Arizona State University. Ali is also a registered Professional Engineer in CA.

Ali Emamjomeh

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Refreshments: 1:45pm, **Seminar**: 2-3pm