

Seminar

Interfacial and Electrocatalytic Engineering of Zinc-Air Batteries: From Anode Passivation Mechanisms to Bifunctional Cathodes and Miniaturized Devices

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Rechargeable zinc air batteries (ZABs) are promising candidates for next-generation energy storage, offering high theoretical energy density, intrinsic safety and low cost, yet their practical maturity is limited by anode degradation and sluggish cathodic oxygen reactions. In this talk, I will first describe a previously overlooked anodic degradation pathway in alkaline ZABs, a route distinct and more severe than hydrogen evolution. I will then discuss about the development of a bifunctional cathode catalyst, filling the gap between pH universal activity claimed in half-cell tests and full cell operation. Finally, I will present the translation of the ZAB chemistry into miniaturised devices, demonstrating ZAB electrode fabrication on interdigitated electrode chips and full cell operation with a near neutral gel electrolyte, realising compact zinc air microbatteries for microdevice applications.

Tuesday, Jul 28th 2026

14:30 Hrs (Tea / Coffee 14:15 Hrs)

Auditorium, TIFRH