

Thermal Characterization of Sodium Ion Batteries

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Abstract:

A sodium-ion battery is a type of rechargeable battery that uses sodium ions (Na^+) instead of lithium ions (Li^+). It's different from lithium-ion batteries in terms of lower energy density, potentially lower cost due to abundant sodium resources, and suitability for applications where cost is more critical than energy density. Sodium-ion batteries are still in development but have potential in grid energy storage, stationary energy storage, and cost-sensitive transportation applications. Lithium-ion batteries, with higher energy density and longer cycle life, are currently more established and widely used in various industries. In this project, Thermal management and analysis are essential for sodium-ion batteries. They involve monitoring and controlling temperature through cooling systems, sensors, and insulation. Thermal analysis techniques like calorimetry and thermal imaging help ensure safe and efficient battery operation, prevent overheating, and optimize battery lifespan.

Keywords: *Sodium-ion battery, lithium-ion batteries, grid energy storage, Thermal Characterization, optimize battery lifespan, insulation, calorimetry, and thermal imaging,*