In this study, the isotropic and anisotropic thermal conductivities of the four commercially available lithium-ion batteries, ie, LiCoO 2, LiMn 2 O 4, LiFePO 4, and Li (NiCoMn)O 2, were reviewed and evaluated numerically through the ???

Thermophysical parameters, including the specific heat and thermal conductivity of lithium-ion batteries (LIBs), are the key parameters for the design of battery thermal management systems in electric vehicles.

The cell cooling coefficient (CCC) is a thermal metric designed to describe the application-relevant thermal properties of lithium-ion cells, defining the amount of self-generated heat a cell can reject through a cooled surface, for a given temperature difference

# THERMAL PROPERTIES OF LITHIUM-ION BATTERY AND COMPONENTS

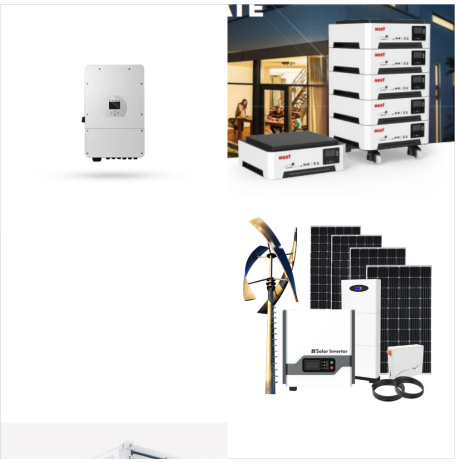
While numerous simulations have attempted to predict the thermal properties of lithium-ion batteries and propose enhancements to their thermal behavior, comprehensive comparative analyses and investigations into diverse thermal configurations remain limited.

Knowledge of the thermal transport properties of the individual battery components and their combination is required for the design of thermally optimized lithium-ion batteries. Based on this, the limiting components can be identified and potentially improved.


Battery thermal management systems, responsible for managing the thermal profile of battery cells, are crucial for balancing the trade-offs between battery performance and lifetime. Designing such systems requires accounting for the multitude of heat sources within battery cells and packs.

# THERMAL PROPERTIES OF LITHIUM-ION BATTERY AND COMPONENTS


Experimental thermal property data of the Sony US-18650 lithium-ion battery and components are presented, as well as thermal property measuring techniques. The properties in question are specific heat capacity (C{sub p}), thermal diffusivity ({alpha}), and thermal conductivity ({kappa}), in the presence and absence of electrolyte [1



A bottom-up approach to calculate the overall and averaged thermal properties of the jelly roll or electrode stack of Li-ion cells in a generally applicable way is introduced. The model is based on temperature-dependent material properties and is specifically applied