



batteries



Special Issue Reprint

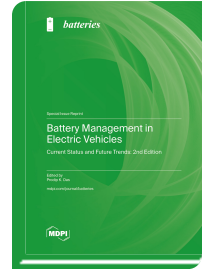
Battery Management in Electric Vehicles

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Li-ion batteries (LiBs) are central to the global transition toward zero-carbon energy and the achievement of the COP26 target of net-zero emissions by mid-century. However, their rapid adoption presents a range of challenges. As demand for LiBs increases, especially in electric vehicles (EVs), concerns about their environmental impact and the stability of supply chains are mounting. The key materials used in LiBs are finite and concentrated in specific regions, heightening the risk of supply disruptions. Additionally, the eventual disposal of large quantities of battery waste introduces further complications. To address these challenges, the implementation of advanced battery management techniques in electric vehicles is essential. These strategies can enhance battery performance, extend their lifespan, enable secondary applications, and promote the recycling and reuse of EV batteries, thereby mitigating both environmental and supply chain risks. This Reprint seeks to update the scientific community on the latest advancements and future trends in EV battery management. It encompasses a broad spectrum of developments, ranging from foundational battery research to cutting-edge approaches like electro-thermal modeling, state-of-health estimation, thermal runaway analysis, aging and degradation studies in lithium batteries, and the development of modular battery management system (BMS) topologies. These innovations aim to optimize battery performance, improve efficiency, and ensure the long-term reliability of EV batteries.



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