

How to evaluate capacity consistency of lithium-ion battery packs?

On such basis, a capacity consistency evaluation method of lithium-ion battery packs is proposed using magnetic field feature extraction and  $k$ -nearest neighbors ( $k$ -NNs), and the effectiveness of the method is verified by experimental testing.

Are grouped lithium-ion batteries consistent?

Qian et al. evaluated the consistency of grouped lithium-ion batteries based on characteristic peaks of incremental capacity curves. This method can quickly describe the consistency issue of battery packs and can be applied during the charging process of battery packs.

How to determine battery pack consistency?

First, the capacity of each cell in the battery pack  $Q_i$ , the difference in remaining chargeable capacity of each cell when the battery pack reaches the charge cutoff condition  $Q_{di}$ , and the internal resistance of each cell  $R_i$  are determined to accurately characterize the battery pack consistency.

Does capacity consistency matter in battery pack performance testing & maintenance?

The results show that the proposed method can accurately diagnose the capacity consistency of the tested battery pack, which provides a basis for battery pack performance testing and maintenance. The capacity inconsistency among commercial lithium-ion battery packs is an important factor affecting their service life.

What causes battery pack inconsistency?

The battery pack inconsistency is affected by factors such as battery capacity, internal resistance, and self-discharge rate during use, resulting in differences in aging and SOC, causing secondary inconsistency. In recent years, many scholars have conducted extensive research on the inconsistency problem of lithium-ion battery packs.

Are lithium ion batteries safe?

Abstract One of the main obstacles for the reliability and safety of a lithium-ion battery pack is the difficulty in guaranteeing its capacity consistency at harsh operating conditions, while the  $k$ ...

Nov 19, 2024&ensp;&#0183;&ensp;During the service process of lithium-ion battery packs, there is inconsistency among the cells in the pack, resulting in a significant decline in battery performance and ...

Oct 4, 2024&ensp;&#0183;&ensp;Lithium-ion battery energy storage systems (ESSs) occupy the majority share of cumulative installed capacity of new energy storage. Consistency of an ESS significantly ...

Abstract The consistency deterioration of lithium-ion battery packs is a key factor affecting their performance, safety and other aspects. This study establishes a mathematical model of a ...

Mar 2, 2022&ensp;&#0183;&ensp;The capacity inconsistency among commercial lithium-ion battery packs is an important factor affecting their service life. However, there is still a lack of detection methods to ...

Therefore, real-time safety status analysis of battery cells is important for large-scale The safe operation of large-scale energy storage power stations is essential. Therefore, the consistency ...

The consistency of lithium battery packs includes open circuit voltage, capacity, and internal resistance. More deeply, it also includes the K ...

Jan 13, 2022&ensp;&#0183;&ensp;One of the main obstacles for the reliability and safety of a lithium-ion battery pack is the difficulty in guaranteeing its capacity consistency at harsh operating conditions, while the ...

Nov 27, 2021&ensp;&#0183;&ensp;When used as a power source for drones, RC portable medical equipment, etc., the single lithium battery cannot meet the ...

Jan 13, 2022&ensp;&#0183;&ensp;Abstract One of the main obstacles for the reliability and safety of a lithium-ion battery pack is the difficulty in guaranteeing its capacity ...

Jun 9, 2023&ensp;&#0183;&ensp;The grouping and large-scale of battery energy storage systems lead to the problem of inconsistency. Practical consistency evaluation is significant for the management, ...

Feb 1, 2024&ensp;&#0183;&ensp;Lithium-ion batteries, used in EVs, have the advantages of cleanliness, high energy density, and low self-discharge rate [2]. The battery pack for EVs usually contains hundreds to ...

Jul 23, 2025&ensp;&#0183;&ensp;For high-performance Li-ion battery pack applications--such as energy storage systems (ESS), power tools, and medical devices--cell consistency is the critical factor that ...

Oct 16, 2025&ensp;&#0183;&ensp;The development of solar lithium battery technology has been to control costs, improve the energy density and power density of lithium batteries, enhance the use of safety, ...

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