

How to evaluate lithium-ion battery pack consistency?

Consistency evaluation features can be extracted online. An improved fuzzy clustering algorithm is developed to evaluate pack consistency. The proposed methods are validated by nine months of electric vehicle data. Consistency is an essential factor affecting the operation of lithium-ion battery packs.

What are battery pack consistency evaluation indicators?

Currently, the battery pack consistency evaluation indicators are unclear and are roughly divided into single-parameter and multi-parameter evaluations. Single-parameter evaluation usually uses voltage or SOC to characterize the consistency of the battery pack.

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.

How to diagnose a battery pack inconsistency?

Considerable research efforts have been devoted to the diagnosis and evaluation of battery pack consistency. To diagnose faults and provide early warning of the inconsistencies, existing methods can be mainly divided into model-based and data-driven methods.

How to evaluate battery pack consistency online during EV charging?

The proposed consistency evaluation framework can be deployed on the monitoring platform to evaluate the battery pack consistency online during EV charging based on vehicle cloud information interaction. The remainder of this paper is organized as follows: Section 2 describes data acquisition and compression.

Why is consistency important in battery packs?

The evaluation of consistency in battery packs is therefore crucial. The initial consistency concerns the differences between batteries, even for those manufactured in the same batch.

A Method for Consistency Determination of Battery Energy Storage System Based on Fuzzy Comprehensive Evaluation Yu Cai, Shufeng Dong and Jiaxiang Wang ... system could consist of hundreds of battery packs and the battery pack is composed by hundreds of cells in series. The battery cells impact with each other, in another

This paper presents an online estimation algorithm of insulation resistance based on an adaptive filtering algorithm for a battery energy storage system. Specifically, the insulation detection ...

Electric vehicle power battery consistency is the key factor affecting the performance of power batteries. it is

not scientific to evaluate the consistency of the battery depending on voltage or capacity. In this paper, multi-parameter evaluation method for battery consistency based on principal component analysis is proposed. Firstly, the characteristic ...

Inconsistency is common in lithium-ion battery packs and it results in voltage differences. Data from a battery pack with 200 cells connected in serial in a battery energy storage system (BESS ...

A method to evaluate the consistency of battery packs was proposed in this article. With such evaluation, the administrator of the energy storage system could understand the deterioration of the battery packs and remove the abnormal state to avoid the potential failures and extend the battery life.

DOI: 10.1016/j.energy.2020.116944 Corpus ID: 213175255; Consistency evaluation and cluster analysis for lithium-ion battery pack in electric vehicles @article{Tian2020ConsistencyEA, title={Consistency evaluation and cluster analysis for lithium-ion battery pack in electric vehicles}, author={Jiaqiang Tian and Yujie Wang and Chang Liu and Zonghai Chen}, journal={Energy}, ...

Highlights o Consistency evaluation based on multi-feature weighted for batteries is proposed. o The weights of features are determined by the entropy weight method. o ...

Signal processing-based methods: The consistency of the battery pack can be directly reflected through a signal processing process of the measurement such as voltage [14], current [15], temperature [16], and electrochemical impedance spectrum (EIS) [17]. Wang et al. [18] employed the square of the standard deviation coefficient (SDC) to evaluate the ...

The SOC consistency of battery pack can be employed as evaluation index representing the battery consistency level. As is known, the SOC-OCV function is a representative for a particular battery, and is generally a nonlinear monotone function between SOC and OCV for all lithium-ion batteries.

Consistency is an essential factor affecting the operation of lithium-ion battery packs. Pack consistency evaluation is of considerable significance to the usage of batteries. Many existing methods are limited for they are based on a single feature or can only be implemented offline. This paper develops a comprehensive method to evaluate the ...

Accurate consistency diagnosis of series-connected battery packs is crucial for the safety management of lithium-ion batteries. However, traditional methods for extracting and ...

The embodiment of the invention discloses a battery pack consistency detection method and device, a readable storage medium and electronic equipment. And determining a differential curve for representing the phase change process of the active substances in each single battery according to the cell voltage and the charging capacity. And detecting the consistency of the ...

Consistency Evaluation of Electric Vehicle Battery Pack: Multi-feature Information Fusion Approach  
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The SOC consistency of battery pack can be employed as evaluation index representing the battery consistency level. As is known, the SOC-OCV function is a representative for a particular battery, and is generally a nonlinear monotone function. Application of battery equilibrium diagnosis.

With the rapid development of electric vehicles (EVs), there is a growing concern about the safety issues of their traction batteries [1], [2], [3] order to meet the driving power demand and obtain the desired vehicle range, hundreds or even thousands of cells are connected in a series-parallel structure within a battery pack [4], [5], [6]. ...

Complete consistency in the battery pack is almost non-existent. What we can do is to minimize the inconsistency as much as possible. ... In addition, this method reduces the battery pack utilization rate, which is not ...

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