

1 Introduction. Since the commercial lithium-ion batteries emerged in 1991, we witnessed swift and violent progress in portable electronic devices (PEDs), electric ...

To address the issues mentioned above, many scholars have carried out corresponding research on promoting the rapid heating strategies of LIB [10], [11], [12]. Generally speaking, low-temperature heating strategies are commonly divided into external, internal, and hybrid heating methods, considering the constant increase of the energy density of power ...

Lithium-ion battery performance decreases significantly at low temperatures compared to above-zero temperatures, especially in capacity. ... This paper proposes a new hybrid method, namely the CNN-BWGRU network, to estimate the SOC of lithium-ion batteries at low temperatures.

With the rising of energy requirements, Lithium-Ion Battery (LIB) have been widely used in various fields. To meet the requirement of stable operation of the energy-storage devices in extreme climate areas, LIB needs to further expand their working temperature range. In this paper, we comprehensively summarize the recent research progress of LIB at low temperature from the ...

In general, enlarging the baseline energy density and minimizing capacity loss during the charge and discharge process are crucial for enhancing battery performance in low-temperature environments [[7], [8], [9], [10]]. Li metal, a promising anode candidate, has garnered increasing attention [11, 12], which has a high theoretical specific capacity of 3860 mA h g⁻¹ ...

Currently, most literature reviews of BTMS are about system heat dissipation and cooling in high-temperature environments [30], [31]. Nevertheless, lithium-ion batteries can also be greatly affected by low temperatures, with performance decaying at sub-zero temperatures [32], [33]. Many scholars have studied the causes of battery performance degradation in low ...

With the development of technology and the increasing demand for energy, lithium-ion batteries (LIBs) have become the mainstream battery type due to their high energy ...

Military ultra-low temperature lithium battery it is an energy storage device that can still work normally under extreme low temperature conditions and is widely used in various equipment ...

This study investigates long-term capacity degradation of lithium-ion batteries after low temperature exposure subjected to various C-rate cycles. Findings reveal that low ...

Yamoussoukro low temperature lithium battery

Lithium difluoro (oxalate)borate (LiDFOB) is another well-known lithium salt used for improving low temperature battery characteristics [185]. However, it is proven that traditional electrolyte with LiDFOB has poor temperature performance [166]. Nevertheless, if this salt is combined with another electrolyte system, low temperature performance ...

Lithium-ion (Li-ion) batteries have become the power source of choice for electric vehicles because of their high capacity, long lifespan, and lack of memory effect [[1], [2], [3], [4]]. However, the performance of a Li-ion battery is very sensitive to temperature [2]. High temperatures (e.g., more than 50 °C) can seriously affect battery performance and cycle life, ...

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