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Title: Self-discharge principle of new energy battery cabinet

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Is self-discharge an unwelcome phenomenon in electrochemical energy storage devices?

Self-discharge is an unwelcome phenomenon in electrochemical energy storage devices. Factors responsible for self-discharge in different rechargeable batteries is explored. Self-discharge in high-power devices such as supercapacitor and hybrid-ion capacitors are reviewed. Mathematical models of various self-discharge mechanisms are disclosed.

Do electrochemical energy storage systems self-discharge?

Further, the self-discharging behavior of different electrochemical energy storage systems, such as high-energy rechargeable batteries, high-power electrochemical capacitors, and hybrid-ion capacitors, are systematically evaluated with the support of various theoretical models developed to explain self-discharge mechanisms in these systems.

Can Evans diagram be transplanted into self-discharge in rechargeable batteries?

Identical kinetics and thermodynamics between corrosion of metals and self-discharge of batteries. Only the irreversible type of self-discharge is considered. Therefore, the theory and methodology of Evans Diagram can be feasibly transplanted into self-discharge in rechargeable batteries.

How to address self-discharge in energy storage systems?

Different self-discharge mechanisms are analyzed in detail and provide prospects to address the self-discharge in energy storage systems by giving directions to the various self-discharge suppression strategies, varying from diverse device components (electrode and electrolyte materials, separators, etc.) to cell assembling and protocols.

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In this perspective, after an introduction to electrochemical fundamentals, as well as the identical origination of battery self-discharging and metal corrosion, we first transferred the ...

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