

Dielectric-based energy storage capacitors characterized with fast charging and discharging speed and reliability 1,2,3,4 play a vital role in cutting-edge electrical and electronic ...

Recent progresses in polymer-based and ceramic-based dielectric composite materials for energy storage and conversion are selectively reviewed with an attention to capacitive energy storage, ...

Among currently available energy storage (ES) devices, dielectric capacitors are optimal systems owing to their having the highest power density, high operating voltages, and a long lifetime. ...

The next-generation capacitors have placed higher requirements on energy-storage dielectrics, such as high temperature, high frequency and high voltage. Perovskite ...

Materials offering high energy density are currently desired to meet the increasing demand for energy storage applications, such as pulsed power devices, electric ...

The energy storage density of the metadielectric film capacitors can achieve to 85 joules per cubic centimeter with energy efficiency exceeding 81% in the temperature range ...

High-entropy ceramic dielectrics show promise for capacitive energy storage but struggle due to vast composition possibilities. Here, the authors propose a generative learning ...

The evolutionary success in advanced electronics and electrical systems has been sustained by the rapid development of energy storage technologies. Among various ...

The next-generation capacitors have placed higher requirements on energy-storage dielectrics, such as high temperature, high frequency and high voltage...

This facile and effective approach for constructing dense crosslinking network structures within polymers via chemical crosslinking facilitates the development of superior ...

Besides the linear dielectrics discussed above, relaxor ferroelectrics as nonlinear dielectrics have been extensively studied as capacitive energy storage materials because of ...

This review focuses on recent progress in optimizing the energy storage performance of dielectric ceramic and indicates the correlation between performance and the ...

The present review focuses on the role of different theoretical modeling techniques in understanding

microstructural effects in energy storage dielectrics. State-of-the ...

High-end dielectric capacitors with excellent energy storage performance are urgently desirable to satisfy ever growing demands for miniaturization and integration of ...

The modification methods used to improve room-temperature energy storage performance of polymer films are detailedly reviewed in categories. Additionally, this review ...

(A) Schematic of dielectric energy storage during a charge/discharge process. Points I to II represent the charge process, while points II to III represent the ...

The research status of different energy storage dielectrics is summarized, the methods to improve the energy storage density of dielectric materials are analyzed and the development trend is ...

High-power energy storage systems have important applications in electrical grid, electric vehicles, nuclear, aerospace, telecommunication, military, defense and medical ...

The urgent demand for capacitive energy storage at elevated temperatures is limited by significant leakage currents in existing polymer dielectrics, which lead to excessive ...

Electrostatic capacitors can enable ultrafast energy storage and release, but advances in energy density and efficiency need to be made. Here, by doping equimolar Zr, Hf ...

The progress of modern electronic devices puts forward higher requirements for the energy storage performance of capacitors. In order to further improve the energy storage ...

Maintaining high charge/discharge efficiency while enhancing discharged energy density is crucial for energy storage dielectric films applied in electrostatic capacitors. Here, a ...

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Energy storage of dielectrics

