

Does nanocomposite have high-temperature energy storage capacity?

The nanocomposite's high-temperature energy storage ability was greatly enhanced by precisely regulating the ratio of BT to BNNS. The U_d of the nanocomposite reached 2.92 J/cm^2 , and the BDS was 547 MV/m at 150°C . Compared with pure PEI, they were increased by 83% and 25% respectively.

What are the characteristics of electrostatic energy storage?

Based on the fundamental guiding principles of electrostatic energy storage, the characteristics of large polarization difference $D - P$ ($P_{\text{max}} - P_r$), high breakdown strength (BDS), delayed polarization saturation, and thermal/frequency-stability are required to attain desirable energy storage performances.

How optimum energy storage performance are realized in KNN-0.14 ceramics?

According to the values of recoverable energy density (W_{rec}) and efficiency (η) of the KNN- x ceramics calculated by unipolar $P - E$ loops, we can get that the optimum energy storage performances are realized in KNN-0.14 ceramic resulting from inhibited P_r and improved BDS (Fig. S1 (a-b)).

What is a high recoverable energy density (W_{REC})?

As a result, a high recoverable energy density (W_{rec}) of 7.0 J cm^{-3} and a high efficiency (η) of 85.9% are simultaneously achieved at a high breakdown field of 575 kV cm^{-1} . The ceramic also exhibits excellent high-temperature and outstanding fatigue energy storage stability, achieving a high η of 88.9% at 160°C and $1-10^5$ cycle number.

What are the energy storage parameters of the BHB composite?

In addition, the whole energy storage parameters of the BHB composite--which was created by concurrently loading the BNNSs onto PEI and HfO_2 nanoparticles onto the PP layer in the PPP composite--were further enhanced to a great extent. In particular, its U_d value increased by two times compared with PEI, and the η value remained above 90%.

Does a hysteresis loop improve energy storage performance?

The shape of the hysteresis loop before and after the fatigue test is almost identical for two composites at 150°C , indicating that the polarization intensity of the material maintains excellent stability during repeated charging and discharging. The variation in energy storage performance with cycle count is seen in Figures S23 and 2 D.

Laser processing is employed to fabricate zinc-ion battery (ZIB) anodes with state-of-the-art electrochemical performance from commercial zinc foils. Lasers are widely utilized for industrial ...

DOI: 10.1016/j.jallcom.2024.177880 Corpus ID: 274433197; Improved energy storage performances of P(VDF-HFP)/BNNSs composite: Role of nanosecond electric pulse ...

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Utilizing the Optimization module within the Response Surface Method (RSM) software Design Expert for analysis, it was found that, under the optimal parameters of 400 ...

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Abstract: The all-solid-state inductive energy storage pulse forming line modulator is a brand-new solution to achieve a high repetition rate, high voltage gain, and short pulse output. However, due to the non-ideal dynamic characteristics of ...

Electrical bandwidth and response time. (A) Photovoltage time-trace under illumination with a 150 ns THz pulse having a peak power of 10 mW, recorded with sample A at ...

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