Bismuth ferrite thin film energy storage

Bismuth ferrite (BiFeO3, BFO) exhibits both (anti)ferromagnetic and ferroelectric properties at room temperature. Thus, it has played an increasingly important role in multiferroic system. In this review, we ...

Multiferroic bismuth ferrite (BiFeO 3, abbreviated as BFO) ... It is found that the BFBT thin film shows outstanding energy storage properties with a recoverable energy density of 19 J/cm 3 and an energy efficiency of 51% under an applied electric field of ...

In this study, an innovative approach is proposed, utilizing an ultra-thin multilayer structure in the simple sol-gel made ferroelectric/paraelectric BiFeO 3 /SrTiO 3 (BF/ST) ...

Ultrahigh energy storage density in lead-free antiferroelectric rare-earth substituted bismuth ferrite. Dielectric capacitors hold enormous advantage for energy storage that requires fast ...

In recent years, scientists and engineers seeking to tackle problems like the depletion of fossil fuel sources, rising energy costs, and environmental pollution have paid close attention to the development of electrochemical devices for energy storage and conversion [1, 2].The electrochemical supercapacitors (ESs) are a reliable energy storage technology that ...

The KrF excimer laser was set to energy densities in the range of 1.2-1.34 J cm -2 with a ... J. et al. Direct evidence for the spin cycloid in strained nanoscale bismuth ferrite thin films.

The thin film layer of bismuth ferrite electrode is synthesized by electrodeposition technique. The effect of bismuth (III) nitrate/iron (III) nitrate ... in the present study, the photoactive energy storage materials using bismuth ferrite (BFO) is purposed. The effect of bismuth (III) nitrate to iron (III) nitrate ratio on photo- ...

The following characterization techniques are frequently used while characterizing ferrite thin films to identify the phase, morphology, and the composition of the as-prepared products. 4.2.1 Structural Elucidation. The XRD is a very powerful and suitable technique for characterizing microstructure of thin films/powders.

The findings reported herein help to elucidate the relationship between energy storage performance and thin-film microstructure, thereby providing an effective way for improving the energy storage ...

The exploration of multiferroic materials and their interaction with light at the nanoscale presents a captivating frontier in materials science. Bismuth Ferrite (BiFeO3, BFO), a standout among ...

It is found that the BFBT thin film shows outstanding energy storage properties with a recoverable energy density of 19 J/cm 3 and an energy efficiency of 51% under an applied electric field of 900 kV/cm at room ...

Moreover, we first studied the charge-discharge performance of bulk BFO-based energy storage ceramics and obtained an ultra-high power density p D (~57 MW/cm 3) as well as a large current density value of ~1353 A/cm 2. Consequently, all the results indicate that this ceramic is a promising lead-free candidate for energy storage materials.

@article{Balmuchu2023TheIO, title={The impact of oxygen partial pressure in modifying energy storage property of lanthanum doped multiferroic bismuth ferrite thin films deposited via pulsed laser deposition}, author={Shashi Priya Balmuchu and Ethireddy Radhika and Pamu Dobbidi}, journal={Journal of Energy Storage}, year={2023}, url={https://api ...

Application of ferroelectric oxides in photovoltaic devices has been revived by the emergence of bismuth ferrite thin films, a lead-free perovskite with a narrow bandgap (~2.7 eV) and high ...

In this study, BiFeO3 (BFO) thin films were doped with Ca, and the multiferroic, piezoelectric, and energy-storage properties of Bi1-xCaxFeO3-d (x = 0.3, BCFO) thin films were compared with ...

In this work, the multiferroic bismuth ferrite materials Bi0.9RE0.1FeO3 doped by rare-earth (RE = La, Eu, and Er) elements were obtained by the solution combustion synthesis. Structure, electrical ...

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