

Based on the principle of sustainable development theory, lead-free ceramics are regarded as an excellent candidate in dielectrics for numerous pulsed power capacitor applications due to ...

In this experiment, a new lead-free energy storage ceramic $(1-x)(\text{Na}_{0.5}\text{Bi}_{0.5})_{0.935}\text{Sr}_{0.065}\text{TiO}_3-x\text{Na}_{0.7}\text{Bi}_{0.08}\text{La}_{0.02}\text{NbO}_3$ was prepared using a conventional solid-phase sintering process, and the ...

a The publication data obtained from the "ISI Web of Science" for 10 years (2010-2020).b Percentage of publications based on the various energy storage materials.c Publications percentage based on the form of ceramics for energy storage.d Development history for electrical energy storage for lead-free bulk ceramics. $0.7\text{BaTiO}_3-0.3\text{BiScO}_3$, $0.85(\text{K}_{0.5}\text{Na}_{0.5})\text{NbO}_3$...

A novel lead-free $(1-x)\text{CaTiO}_3-x\text{BiScO}_3$ linear dielectric ceramic with enhanced energy-storage density was fabricated. With the composition of BiScO_3 increasing, the dielectric constant of ...

First principles study of lead free piezoelectric AgNbO_3 and $(\text{Ag}_{1-x}\text{K}_x)\text{NbO}_3$ solid solutions. Solid State Commun., 152 ... Silver niobate based lead-free ceramics with high energy storage density. J. Mater. Chem. A, 7 (2019), pp. 10702-10711, 10.1039/c9ta00995g. View in Scopus Google Scholar

Recently, NaNbO_3 -based ceramics have achieved superior energy storage properties by constructing relaxor antiferroelectrics, which integrates the feature of antiferroelectrics (low P_r) and relaxor ferroelectrics (high i). For example, Qi et. al. found that an ultrahigh W_{rec} of 12.2 J/cm^3 and a satisfied i of 69% can be simultaneously achieved in ...

lead-free dielectric materials including(ceramics, thin/thick films and polymer-based composites) for energy storage applications. Their energy storage principles and properties will be compared and analyzed in order to provide guidance to the searching of new lead-free materials and the design of novel dielectric capacitors with

Investigation of energy storage properties in lead-free BZT-40BCT relaxor ceramic. Author links open overlay panel Rajat Syal a, Priyanka Sharma b, Sham ... Dielectric and ferroelectric properties of $\text{SrTiO}_3\text{-Bi}_{0.5}\text{Na}_{0.5}\text{TiO}_3\text{-BaAl}_{0.5}\text{Nb}_{0.5}\text{O}_3$ lead-free ceramics for high-energy-storage applications. Inorg. Chem., 56 (2017), pp. 13510-13516 ...

The burgeoning significance of antiferroelectric (AFE) materials, particularly as viable candidates for electrostatic energy storage capacitors in power electronics, has sparked substantial interest. Among these, lead-free sodium niobate (NaNbO_3) AFE materials are emerging as eco-friendly and promising alternatives to

lead-based materials, which pose risks ...

Energy storage materials and their applications have attracted attention among both academic and industrial communities. Over the past few decades, extensive efforts have been put on the development of lead-free high-performance dielectric capacitors. In this review, we comprehensively summarize the research Journal of Materials Chemistry C Recent Review ...

With the development and evolution of human society, green and renewable energy sources, such as solar, wind, and tidal energy, have gradually become dominant energy consumption forms [1, 2]. However, the cyclical nature of most renewable energy sources limits their widespread application [[3], [4], [5]]. Thus, efficient storage of energy from solar, wind, and ...

A novel lead-free $(1 - x)\text{CaTiO}_3\text{-}x\text{BiScO}_3$ linear dielectric ceramic with enhanced energy-storage density was fabricated, and first-principles calculations revealed that Sc substitution of Ti-site induced the atomic displacement of Ti ions in the whole crystal lattice, and lattice expansion was caused by variation of the bond angles and lengths.

Role of doping and defect quenching in antiferroelectric NaNbO_3 from first principles. Phys. Rev. B, 106 (2022), Article 134101. View in Scopus Google Scholar ... Novel $\text{Na}_{0.5}\text{Bi}_{0.5}\text{TiO}_3$ based, lead-free energy storage ceramics with high power and energy density and excellent high-temperature stability. Chem. Eng. J., 383 (2020), Article 123154.

Microstructure-driven excellent energy storage NaNbO_3 -based lead-free ceramics. Author links open overlay panel Weiwei Yang a b, Huarong Zeng a b, Fei Yan c d, ... the bulk density of the ceramics was measured by Archimedes principle. As a result, the bulk density of the CS-NBNT and SPS-NBNT ceramics is 4.51 g/cm^3 and 4.79 g/cm^3 , ...

NaNbO_3 (NN) is generally considered as one of the most promising lead-free antiferroelectric (AFE) perovskite materials with the advantages of low cost, low density and nontoxicity. However, the metastable ferroelectric phase causes a large remanent polarization (P_r) at room temperature, seriously hindering the achievement of excellent energy storage ...

The excellent dielectric and ferroelectric properties are achieved by modifying the concentration of A-site elements, which proves that the design idea of non-equal molar ratio high-entropy material is a feasible way to achieve excellent energy storage performance of ...

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