

Dielectric energy-storage capacitors, known for their ultrafast discharge time and high-power density, find widespread applications in high-power pulse devices. However, ceramics featuring a tetragonal tungsten bronze structure (TTBs) have received limited attention due to their lower energy-storage capacity compared to perovskite counterparts.

High-performance compact capacitive energy storage is vital for many modern application fields, including grid power buffers, electric vehicles, and portable electronics.

Advanced Energy Materials is your prime applied energy journal for research providing solutions to today's global energy challenges. Supercapacitors Translating the materials metrics of graphene into supercapacitor performance is critical but engineering capacitive energy storage is challenging.

Films with optimized microcrack arrays exhibit sixfold improved ion diffusion coefficient and high volumetric capacitance of  $221 \text{ F cm}^{-3}$  ( $240 \text{ F g}^{-1}$ ), representing a critical ...

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Massively fabricating graphene with high density and high ion conductivity is critical but challenging for large-scale compact capacitive energy storage with high energy and power densities. Here, we demonstrate an efficient, kilogram-scale method for fabricating dense, turbostratic graphene by turbulent flow and isotropic capillary compression at violent boiling ...

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His research interests include energy storage materials and devices, flexible electronics, and micro/nanomanufacturing technologies. He received the silver prize of HIWIN Doctoral Dissertation Award. ... Jinyou Shao received the Ph.D. degree from Xi'an Jiaotong University, Xi'an, China, in 2009. He is currently a Professor and Director of ...

Jinyou Shao; Massive fabrication of graphene with high density and high ion conductivity has been a long-standing challenge for energy storage communities. Here, inspired by the turbostratic aligning of tea leaves in boiling water, we propose a new design of turbostratic graphene formed following turbulent flow and densified by isotropic ...

High density and high ion conductivity are usually incompatible but highly needed for compact, high-power capacitive energy storage. Herein, we demonstrate a new ...

MITEI's three-year Future of Energy Storage study explored the role that energy storage can play in fighting climate change and in the global adoption of clean energy grids. Replacing fossil fuel-based power generation with power generation from wind and solar resources is a key strategy for decarbonizing electricity. Storage enables electricity systems to remain in... [Read more](#)

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Supercapacitors have shown extraordinary promise for miniaturized electronics and electric vehicles, but are usually limited by electrodes with rather low volumetric performance, which is largely due to the inefficient utilization of pores in charge storage. Herein, we design a freestanding graphene laminate film electrode with highly efficient pore utilization for compact ...

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Fengwan Zhao, Jie Zhang\*, Hongmiao Tian, Chengping Lv, Hechuan Ma, Yongyi Li, Xiaoming Chen\*, Jinyou Shao, High Energy Storage Performance of Triple-layered Nanocomposites with Aligned Conductive Nanofillers over a Broad Electric Field Range, Energy Storage Materials, 2023, 63,103013. 8. Shuai Li, Hongmiao Tian\*, Yu Fan, Chunhui Wang, Xiangming ...

Fengwan Zhao Jie Zhang +5 authors Jinyou Shao. Materials Science, Engineering. Energy Storage Materials. 2023; 7. ... Science, Physics. Materials horizons. 2023; High-energy density polymer dielectrics play a crucial role in various pulsed energy storage and conversion systems. So far, many strategies have been demonstrated to be able to ...

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Simultaneously achieving high energy density ( $U_e$ ) and charge-discharge efficiency ( $\eta$ ) of dielectric materials at the relatively low operating electric field remains a persistent challenge to their practical applications. Herein, a P(VDF-HFP)-based triple-layer film by introducing the core-shell  $\text{Al}_2\text{O}_3@\text{CNT}$  in the middle layer and 0.05 wt.% boron nitride nanosheets (BNNSs) in the ...

Formation of thick, high energy density, flexible solid supercapacitors is challenging because of difficulties infilling gel electrolytes into porous electrodes. Incomplete infilling results in a ...

As a vital material utilized in energy storage capacitors, dielectric ceramics have widespread applications in high-power pulse devices. However, the development of dielectric ceramics with both high energy density and efficiency at high temperatures poses a significant challenge. In this study, we employ high-entropy strategy and band gap engineering to enhance the energy ...

Stack cells deliver an energy density of 83.2 Wh  $\text{L}^{-1}$  and power density of 14 kW  $\text{L}^{-1}$ , a milestone in capacitive energy storage. Moreover, orientation and porosity of turbostratic graphene can ...

This cascade effect results in outstanding energy storage performance, ultimately achieving a recoverable energy density of 8.9 J  $\text{cm}^{-3}$  and an efficiency of 93% in  $\text{Ba}_{0.4}\text{Sr}_{0.3}\text{Ca}_{0.3}\text{Nb}_{1.7}\text{Ta}_{0.3}\text{O}_6$  ...

Storing as much energy as possible in as compact a space as possible is an ever-increasing concern to deal with the emerging "space anxiety" in electrochemical energy storage (EES) devices ...

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