

The significance of high-entropy effects soon extended to ceramics. In 2015, Rost et al. [21], introduced a new family of ceramic materials called "entropy-stabilized oxides," later known as "high-entropy oxides (HEOs)". They demonstrated a stable five-component oxide formulation (equimolar: MgO, CoO, NiO, CuO, and ZnO) with a single-phase crystal structure.

This book presents the latest progress in energy materials, energy storage, batteries, and supercapacitors. The contents include topics such as fundamentals of energy materials, photovoltaic materials and devices, electrochemical ...

His research interests focus on the discovery of new solids including sustainable energy materials (e.g. Li batteries, fuel storage, thermoelectrics), inorganic nanomaterials and the solid state chemistry of non-oxides. His research also ...

This book explores the fundamental properties of a wide range of energy storage and conversion materials, covering mainstream theoretical ...

This book collects papers from ICESTA-2021 organized by the Centre of Excellence for Electrical Energy Storage Technology, Universitas Sebelas Maret, Surakarta, Indonesia, held online on October 27, 2021. The conference focused on activities related to the development of advanced and state-of-the-art energy storage technologies to support electric vehicles and renewable ...

Following an introduction to thermal energy and thermal energy storage, the book is organised into four parts comprising the fundamentals, materials, devices, energy storage systems and applications of thermal ...

This book thoroughly investigates the pivotal role of Energy Storage Systems (ESS) in contemporary energy management and sustainability efforts.

Thermal energy storage (TES) technology is playing an increasingly important role in addressing the energy crisis and environmental problems. Various TES technologies, including sensible-heat TES, latent-heat TES, and thermochemical TES, have been intensively investigated in terms of principles, materials, and applications.

Comprehensive reference work for researchers and engineers working with advanced and emerging nanostructured battery and supercapacitor materials Lithium-ion batteries and supercapacitors play a vital role in the paradigm shift towards sustainable energy technology. This book reviews how and why different nanostructured materials improve the performance ...

In our previous work, epitaxial $\text{Ba}(\text{Zr}_{0.2}\text{Ti}_{0.8})\text{O}_3$ thick films ($\sim 1\text{-}2\text{ }\mu\text{m}$) showed an excellent energy storage performance with a large recyclable energy density ($\sim 58\text{ J/cc}$) and a high energy efficiency ($\sim 92\%$), which was attributed to a nanoscale entangled heterophase polydomain structure. Here, we propose a detailed analysis of the ...

Factors affecting energy storage and conversion focussing on high entropy and phase change-based materials are covered. The concepts in the book are supported by illustrations and case studies. Features: Covers ...

This book explores the fundamental properties of a wide range of energy storage and conversion materials, covering mainstream theoretical and experimental studies and their applications in green energy.

This book covers recent technologies developed for energy harvesting as well as energy storage applications. The book includes the fabrication of optoelectronic devices such as high-efficiency c-Si solar cells, carrier selective c-Si solar ...

Chapter 2 - Electrochemical energy storage. Chapter 3 - Mechanical energy storage. Chapter 4 - Thermal energy storage. Chapter 5 - Chemical energy storage. Chapter 6 - Modeling storage in high VRE systems. Chapter 7 - Considerations for emerging markets and developing economies. Chapter 8 - Governance of decarbonized power systems ...

Chapter 8 delves into modelling of thermal energy storage materials at the molecular scale, which is also unique in TES-related books. ... Chapter 10 is the second long chapter of this book due to the significant progress in the development of latent heat storage technology over the past decade, particularly commercial deployment of high ...

Solar Energy Harvesting, Conversion, and Storage: Materials, Technologies, and Applications focuses on the current state of solar energy and the recent advancements in nanomaterials for different technologies, from harnessing energy to storage. The book covers different aspects of advanced nanomaterials for solar energy, rapid developments in solar thermal and hot water ...

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