

Supercapacitors and batteries are among the most promising electrochemical energy storage technologies available today. Indeed, high demands in energy storage devices require cost-effective fabrication and robust electroactive materials. In this review, we summarized recent progress and challenges made in the development of mostly nanostructured materials as well ...

Over the past few years, there has been a steady growth of light vehicle production in all the major markets (Fig. 1 (b)) [9]. As potential substitutions for conventional engineering materials (e.g., steel and cast iron), lightweight materials for automobiles can be primarily divided into four categories, light alloys (e.g., aluminum, magnesium, and titanium ...

Energy storage materials such as batteries, supercapacitor, solar cells, and fuel cell are heavily investigated as primary energy storage ... cells have become a ubiquitous material of 21st century for energy storage applications ranging from cell phones to automobiles and power plants, due to their high efficiency, excellent load performance ...

The aim of this Special Issue entitled "Advanced Energy Storage Materials: Preparation, Characterization, and Applications" is to present recent advancements in various aspects related to materials and processes contributing to the creation of sustainable energy storage systems and environmental solutions, particularly applicable to clean ...

The urgent need for efficient energy storage devices (supercapacitors and batteries) has attracted ample interest from scientists and researchers in developing materials with excellent electrochemical properties. Electrode material based on carbon, transition metal oxides, and conducting polymers (CPs) has been used. Among these materials, carbon has ...

Energy storage materials are functional materials that utilize physical or chemical changes in substances to store energy [18-20]. From: Journal of Alloys and Compounds, 2023. ... from smart micro batteries to large-scale electric automobiles. Though the dramatic performance of the energy storage devices is witnessed, there is still notable ...

1 Introduction. Global energy consumption is continuously increasing with population growth and rapid industrialization, which requires sustainable advancements in both energy generation and energy-storage technologies. [] While bringing great prosperity to human society, the increasing energy demand creates challenges for energy resources and the ...

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