

Flexible energy storage devices based on graphene-based materials with one-dimensional fiber and two-dimensional film configurations, such as flexible supercapacitors, lithium-ion and lithium-sulfur and other batteries, have displayed promising application potentials in flexible electronics. ... [81], (c) SEM image of all-graphene core-sheath ...

Nanomaterials for energy storage and transfer devices like supercapacitors and batteries have been widely researched on the purpose of obtaining desirable performances. A novel hybrid nanocomposite based on tubular MnO₂, polyindole and reduced graphene oxides was synthesized by a simple method and the optimal mass ratio of each raw material was ...

2 Graphene-Based Materials for MEHDs. Since the solar energy, mechanical energy (e.g., triboelectric, piezoelectric, and thermoelectric), and other types of energy (e.g., moisture, liquid flow) are relatively stable and commonly existed in our living environment, harvesting energy from these renewable and green sources is an effective way to alleviate energy and environment ...

The development of energy storage materials is critical to the growth of sustainable energy infrastructures in the coming years. Here, a composite phase change material (PCM) based on graphene and ...

Graphene is known as an independent standing 2D material with a thickness of one carbon atom. The atoms of carbon are called sp² hybridized atoms which are merged in a honeycomb network. This is a basic pillar for other carbon-based materials such as graphite, carbon nanotubes and fullerenes [[42], [43], [44]]. Graphene has attracted attention as a carbon ...

Energy storage is a grand challenge for future energy infrastructure, transportation and consumer electronics. ... Liu, J. Charging graphene for energy. Nature Nanotech 9, 739-741 (2014). <https://doi.org/10.1038/nnano.2014.100> ...

This paper gives a comprehensive review of the recent progress on electrochemical energy storage devices using graphene oxide (GO). GO, a single sheet of graphite oxide, is a functionalised graphene, carrying many oxygen-containing groups. ... a core-shell nanostructure comprising Li₂S nanospheres with an embedded GO sheet as a ...

Thermal energy storage is a promising, sustainable solution for challenging energy management issues. We deploy the fabrication of the reduced graphene oxide (rGO)-polycarbonate (PC) as shell and polyethylene glycol (PEG) as core to obtain hydrophobic phase change electrospun core-shell fiber system for low-temperature thermal management ...

Graphene has generated significant interest since its discovery in 2004 due to its exceptional mechanical,

electrical, and thermal characteristics [1] s high strength/strain-to-failure [2], huge surface area [3], and chemical stability [4] have led to specific applications. These attributes have also been employed in the progress of nanoelectronics [7], [8], energy storage ...

The well prescribed ink is the core for the inkjet printing method. ... [118] reported, for the first time, the usage of a RepRap FDM printer for construction of electrochemical energy storage architectures by a graphene/PLA filament. The as-printed lithium-ion anode showed good columbic efficiency and overall reversibility. This study proposed ...

Graphene has now enabled the development of faster and more powerful batteries and supercapacitors. In this Review, we discuss the current status of graphene in energy storage, highlight ongoing ...

In this study, we demonstrate a new type of hierarchical-ordered MoS₂ nanoarrays/porous graphene core-shell microfiber (MoS₂ /PGF), that is, with high electrochemical activity and interface-engineered structure in addition to uniformly porous network, via microfluidic self-assembly and in-situ chemical bonds coupling. Specifically, the ...

While abundant combinations of carbon-based materials have been synthesized, the aligned structure of CNTs-G hybrids has benefits such as high surface area, inter-tube design, the strong connection among CNTs and graphene layers, and high thermal and electrochemical stability during the performance in energy conversion and storage devices [17 ...

The storage capacity of graphene can be increased by surface functionalization. A promising route is decoration with alkaline-earth or transition metals. A transition metal will ...

From RCh stabilized Pickering emulsions, a high energy storage GO-modified microPCM with photothermal conversion capacity was obtained. The microPCM exhibited a high encapsulation ratio of 92.3%, high enthalpy heat energy storage of 234.7 J/g, no leakage, high thermal reliability, and stability at a 9:1 core/shell ratio.

The biomass-derived mesoporous core-shell Fe₃C@graphene oxide nanospheres (mFe₃C@GO NSs) was synthesized with high-quality lignins and applied for electrochemical energy storage. The synthesis conditions of mFe₃C@GO NSs are optimized and its formation mechanism is proposed. The mFe₃C@GO NSs homogeneously dispersed ...

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