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Graphene Platforms for Smart Energy Generation and StorageIn the present review, we highlight recent advances in graphene-based smart energy generation and storage devices. Progress in tailoring the properties of graphene is Improved Energy Storage Performance of Insulated This study focused on suppression of high energy dissipation associated with polymer/graphene nanocomposites (PGNs), which hinders their practical applicationsFunctionalization of graphene materials by heteroatom-doping for energy Doping of graphene materials with single or multiple heteroatoms has opened up a rich field of charge-extraction materials with tunable work functions for optoelectronic Modified MXene/Holey Graphene Films for Advanced In addition, the assembled symmetric supercapacitor demonstrates a fantastic volumetric energy density (38.6 Wh L -1), which is the highest value reported for MXene-based Enabling Graphene-Oxide-Based Membranes for Large-Scale Energy Storage Graphene-based membranes have been explored in different energy and environmental applications. The 2D nanochannel structure and low frictional water flow inside From biomass wastes to vertically aligned graphene nanosheet arraysFrom biomass wastes to vertically aligned graphene nanosheet arrays: A catalyst-free synthetic strategy towards high-quality graphene for electrochemical energy storage Graphene-Metal oxide Nanocomposites: Empowering Next-Generation energy In conclusion, the review underscores the potential of graphene-based metal oxide composites as promising materials for next-generation energy storage devices to meet Angewandte Chemie International Edition Abstract Hybrid 2D-2D materials composed of perpendicularly oriented covalent organic frameworks (COFs) and graphene were prepared and tested for energy storage Graphene hybridization for energy storage applicationsThis review will focus on diverse graphene hybridization principles and strategies for energy storage applications, and the proposed outline is as follows. First, graphene and its Modified MXene/Holey Graphene Films for Advanced In addition, the assembled symmetric supercapacitor demonstrates a fantastic volumetric energy density (38.6 Wh L -1), which is the highest value reported Intercalated graphene oxide for flexible and practically large Here we employed graphene oxide (GO) to develop a flexible/disposable bi-functional thermal energy harvesting and electrical energy storage device. Rational Design of Nickel Hydroxide-Based Nanocrystals on Graphene A composite electrode composed of Co/Mn co-doped Ni hydroxide nanocrystals and reduced graphene oxide (rGO) is designed and synthesized, demonstrating Plasma-electric field controlled growth of oriented graphene for energy Hence, this fact clearly evidenced that the angle of inclination of electric field has a predominant role in tuning the morphology from planar to vertical graphene and hence its Dense graphene papers: Toward stable and recoverable Al-ion For addressing the challenges of balancing the rapid ion transport channels and volumetric/areal energy storage capability at a dense fashion, here an exceptional conductive Intercalated graphene oxide for flexible and practically large Here we employed graphene oxide (GO) to develop a flexible/disposable bi-functional thermal energy harvesting and electrical energy storage device. Dense graphene papers: Toward stable and recoverable Al-ion For addressing the challenges of balancing the rapid ion transport channels and volumetric/areal

energy storage capability at a dense fashion, here an exceptional conductive Graphene-based composites for electrochemical energy storageSince the first exfoliation in , graphene has been widely researched in many fields of materials engineering due to its highly appealing propertie Application of graphene in energy storage device - A reviewMost applications in energy storage devices revolve around the application of graphene. Graphene is capable of enhancing the performance, functionality as well as Surface thermodynamic stability of Li-rich Li2MnO3: Effect of The results showed that a defective graphene coating can effectively stabilize surface oxygen by modification of the potential energy surface, while reducing Mn migration and increasing the Graphene oxide supported oxygen vacancy-rich Co3O4 and Ni Graphene oxide (GO), a widely used graphene derivative, serves as an excellent support due to its oxygen-rich surface and ability to uniformly disperse metal catalysts. Intercalation pseudocapacitance of amorphous titanium dioxide Intercalation pseudocapacitance of amorphous titanium dioxide@nanoporous graphene for high-rate and large-capacity energy storage A Molecular Pillar Approach To Grow Vertical Covalent Organic Hybrid 2D-2D materials composed of perpendicularly oriented covalent organic frameworks (COFs) and graphene were prepared and tested for energy storage applications. 3D Printed Graphene Based Energy Storage Devices We subsequently suggest that 3D printing of graphene-based conductive filaments allows for the simple fabrication of energy storage devices with bespoke and Water-induced strong isotropic MXene-bridged graphene sheets Nanoconfined water induces alignment of strong, isotropic macroscopic graphene sheets for electrochemical energy storage tercalation pseudocapacitance of amorphous titanium dioxide Intercalation pseudocapacitance of amorphous titanium dioxide@nanoporous graphene for high-rate and large-capacity energy storage Modified MXene/Holey Graphene Films for Advanced In addition, the assembled symmetric supercapacitor demonstrates a fantastic volumetric energy density (38.6 Wh L -1), which is the highest value reported for MXene-based Activated pyrene decorated graphene with enhanced Abstract Developing graphene based supercapacitor electrodes with enhanced performance are critical to their future energy storage devices. In this study, well-controlled Stretchable All-Gel-State Fiber-Shaped Graphical Abstract Stretchable all-gel-state fibrous supercapacitors are fabricated by 3D hybrid hydrogels via strong macromolecular interaction of graphene and Enabling Graphene-Oxide-Based Membranes for Large Enabling Graphene-Oxide-Based Membranes for Large-Scale Energy Storage by Controlling Hydrophilic Microstructures Two-dimensional architectures and tunable physicochemical New synthesized ionic liquid functionalized graphene oxide: New synthesized ionic liquid functionalized graphene oxide: Synthesis, characterization and its nanocomposite with conjugated polymer as effective electrode 3D Graphene Composites for Efficient Electrochemical Energy StorageWith highly continuous graphene network, hierarchically interconnected porous channels, and robust mechanical strength, 3D graphene (3DG) composites hold great potential Practical Graphene Technologies for Electrochemical Energy Storage Importantly, three typical graphene technologies showing their practical potentials in

electrochemical energy storage are illustrated in details, including the uses as conductive Graphene aerogels for efficient energy storage and conversion,Energy This review aims to summarize the synthetic methods, mechanistic aspects, and energy storage and conversion applications of novel 3D network graphene, graphene derivatives and New synthesized ionic liquid functionalized graphene oxide: New synthesized ionic liquid functionalized graphene oxide: Synthesis, characterization and its nanocomposite with conjugated polymer as effective electrode Graphene aerogels for efficient energy storage and This review aims to summarize the synthetic methods, mechanistic aspects, and energy storage and conversion applications of novel 3D network graphene, Graphene aerogel based energy storage materials - A reviewEnergy storage technologies like supercapacitors [14], [15] and batteries [16], [17] have emerged as the most advanced technology accessible recently. The parameters of Unilamellar Metallic MoS2/Graphene Superlattice for Unilamellar metallic nanosheets possess superiority for electrochemical energy storage and conversion applications compared to the Graphene-based phase change composites for energy harvesting and Graphene-based nanostructures, as either graphene nanosheets or graphene-based porous nanostructures, can improve the thermal conductivity of phase change materials 3D Graphene Composites for Efficient Electrochemical Energy Storage 3D graphene (3DG) composites have attracted significant interest for electrochemical energy storage applications, including supercapacitor, lithium-/sodium-ion Robust graphene oxide-coated porous biochar skeleton SnO2 is regarded as a promising lithium storage material due to the advantage of sequential conversion-alloying reaction mechanism. Unfortunately, large volume expansion Graphene for Energy Storage and Conversion: Synthesis and 2D graphene materials possess excellent electrical conductivity and an sp² carbon atom structure and can be applied in light and electric energy storage and conversion Modified Phase Change Microcapsules with Calcium Carbonate and Graphene Construction of hybrid graphene oxide/graphene nanoplates shell in paraffin microencapsulated phase change materials to improve thermal conductivity for thermal energy

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