Graphene quantum battery

Since Akira Yoshino first proposed the usage of the carbonaceous materials as an anode of lithium ion batteries (LIBs) in 1985, carbonaceous materials such as graphite and graphene have been widely considered as LIB anodes. Here, we explored the application of novel carbonaceous LIB anodes incorporating graphene quantum dots (GQDs). We fabricated a ...

Graphene quantum dots (GQD) have been used in various potential applications due to their range of attractive properties such as high ... G.-M., Li C.-Y. V., Chan K.-Y., Lee C.-W. and Zhong J. 2015 Investigations of high voltage vanadium-metal hydride flow battery toward kWh scale storage with 100 cm2electrodes J. Electrochem. Soc. 163 ...

As a new kind of zero-dimensional (0D) material, graphene quantum dots (GQDs) have broad prospects in energy storage and conversion due to their unique physical and chemical properties. In addition to the excellent properties of ...

Batteries and supercapacitors are the next-generation alternative energy resources that can fulfil the requirement of energy demand worldwide. In regard to the ...

The path that led to the discovery of graphene (Gr) and GQDs (graphene quantum dots) began in 1918 with the study of the graphite oxide flakes properties [1], providing a fundamental basis for understanding the forms of carbon 1924, structural studies of graphite oxide flakes using X-ray diffraction [2] advanced knowledge about their structure, a crucial ...

A Review on Carbon/Graphene Quantum Dots and th eir Ap plictaio ns in Anod e of Lith ium-Ion Batteries International Journal of Engineering Technologies and Management R esearch 87

Developing advanced electrode materials is currently crucial for elevating the capacity and energy density of secondary-ion batteries. Among the plenty of candidates, quantum dots (QDs), especially carbon dots (CDs) and graphene quantum dots (GQDs) have shown promising results to achieve this aim.

Hu et al. [115] reported a new approach to suppress dendrite growth in LSBs with high sulfur deposition by hosting graphene quantum dots (GQDs) in the electrolyte. In this work, the GQDs provided heterogeneous sites for uniform nucleation and controlled the continuous regulation of dendrite-free lithium deposition.

This work presents a facile and effective strategy to restrain zinc dendritic formation and growth for aqueous ZIBs in mild acidic electrolyte, which may facilitate the ...

In the quest for materials sustainability for grid-scale applications, graphene quantum dot (GQD), prepared via

eco-efficient processes, is one of the promising graphitic-organic matters that have the potential to provide greener solutions for replacing metal-based battery electrodes.

Graphene quantum dots (GQDs) were prepared via a simple hydrothermal method. ... Furthermore, the full battery assembled with the Mn-based cathode also demonstrated superior performance. This work provides an in-depth mechanism analysis and inspiration for IPL design, thus advancing the development and practical application of ZIBs. ...

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