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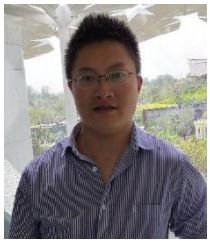
Graphdiyne-Based Electrochemical Interface for High-Performance Lithium Batteries



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Abstract

Recently, 2D graphdiyne has shown many unique advantages for improving the performance of the electrochemical devices. The synthesis method of high-quality graphdiyne nanosheets is developed. Based on this method, all-carbon graphdine nanosheets can be used to protect the silicon nanoparticles and the metal oxides seamlessly, which are two typical lithium-ion battery anode. A 3D all-carbon mechanical and conductive networks with reasonable voids for the silicon and metal oxides can be constructed in situ. This method can effectively restrained their interfacial problems, which is induced by the disintegrations in the mechanical and conductive networks during the repeated volume variations. The as-prepared electrode shows impressive improvements regarding to the capacity and performance retention. Furthermore, this method shows great promises in solving the key problems in other high-energy-density anodes.

Biography:

Zicheng Zuo has completed his PhD in Institute of Chemistry, Chinese Academy of Sciences and postdoctoral research in University of Texas at Austin. He is now an associate professor in Prof. Yuliang Li's group in Institute of Chemistry, Chinese Academy of Sciences. His research interests focus on the design and synthesis of graphdiyne-based materials and electrochemical interface, and studying their interfacial impacts in the energy conversion devices.

1. Low-Temperature Growth of All-Carbon Graphdiyne on a Silicon Anode for High-Performance Lithium-Ion Batteries; May 2018Advanced Materials 30(27):1801459;DOI: 10.1002/adma.201801459
2. Architecture and Properties of a Novel Two-Dimensional Carbon Material-Graphtetrayne;November 2017Nano Energy 43;DOI: 10.1016/j.nanoen.2017.11.005
3. Ultrathin Graphdiyne Nanosheets in-situ Grown on Copper Nanowires and its Performance as Lithium-Ion Battery Anodes;November 2017Angewandte Chemie 130(3);DOI: 10.1002/ange.201711366

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