THE NEW GRAPHENE FAMILY NANOMATERIALS: PREPARATION AND PROPERTIES

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Graphene family materials, including two-dimensional graphene oxide (GO) and reduced GO (rGO) nanosheets already received exceptional attention in scientific community due to their unique structural and physical-chemical characteristics, such as abundant active sites, edge effects and the interconnected network that can be used in fuel cell technology, drug-delivery, and for environmental protection. Further step in development of graphene family materials is discovery of zero-dimensional carbogenic nanoparticles such as graphene oxide quantum dots carbon nanodots. Due to their advantages, such as stability of water suspensions, ease of large-scale preparation, low-costing precursors, highly tunable photoluminescence, and biocompatibility, 0-D carbogenic nanoparticles are alternatives to semiconductor-based quantum dots. Carbon dots can be applied in bioimaging, optical devices, catalysis, adsorbents and many other fields. Here we present recent developments in fabrication of various zero-dimensional carbogenic materials and demonstrate prospective of their application.

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