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Abstract

Herein, we report a new synthesis route for generating porous on graphene with a scalable and controllable size of micron to submicron through the successive insertion of potassium atoms into interlayers of graphite at low temperature. Comprehensive studies such as physico-chemical analysis confirm that the as-obtained porous graphene has few layers with fewer defects. Further, the magnetically separable magnetite (Fe₃O₄)/porous graphene nanocomposites were synthesized through a facile, cost-effective hydrothermal process. The as-prepared nanocomposites were characterized by different analytical techniques. In the nanocomposites, superparamagnetic Fe₃O₄ nanoparticles with an average size of 30 nm nanoparticles uniformly dispersed on the porous graphene sheets, and they acted as mutual spacers in the nanocomposites to avoid aggregation of the magnetic nanoparticles and

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