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Supercapacitors Based on High-Surface-Area Graphene

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Abstract: An improved Hummers method[1,2] was used to the preparation of exfoliated graphite oxide(GO), and graphene with high-surface area was obtained after chemical reduction of GO by hydrazine hydrate. A stable suspension of graphene was formed when ammonium hydroxide was applied to prevent the agglomeration of graphene layers. The results of N_2 adsorption-desorption measurements showed that thus prepared graphene had a high specific surface area ($818m^2g^{-1}$) with an internal pore size distribution ranging from 2.0 nm to 200 rm and the maximum size around 2.5nm. The results of galvanostatic charge/discharge demonstrated such graphene exhibited a maximum specific capacitance of 295 F/g for the first charge/discharge cycle at a current density of 0.05 A/g, and the specific capacitance was about 96% of the first charge/discharge cycle at a current density of 5 A/g after 2000 charge/discharge cycles.[3]

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