High supercapacitor performance based on reduced graphene oxide-templated porous carbon composite by using magnesium ethylene diamine tetra acetate salt

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The use of graphene as a supercapacitor electrode material has become the focus of a considerable amount of research in the field of clean energy devices due to the beneficial combination of great mechanical and electrical properties and large surface area. In this study, we report a simple way to synthesize reduced graphene oxide-templated porous carbon composite by using magnesium ethylene diamine tetra acetate salt (Mg-EDTA) as soft-templates. By dispersing ethylene diamine tetra acetic acid (EDTA) into graphene oxide (GO), EDTA is assembled with GO sheets through interaction between opposite charges on surfaces of EDTA and GO. Magnesium hydroxide ($Mg(OH)_2$) is added and followed annealing to make porous structure after etching by chloride acid (HCl). The electrodes have got a micro-porous structure with average pore width about of 50 Å, and surface area of 718 m^2/g. And the synthesized porous electrodes show capacitance performance as high as 238 F/g.