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Hybrid Graphene Electrodes for Supercapacitors of High Energy DensityFeifei Zhang,^{a,b,c} Jie Tang,^{a,b} Norio Shinya,^a Lu-Chang Qin^d^aNational Institute for Materials Science, Sengen 1-2-1, Tsukuba 305-0047, Japan^bDoctoral Program in Materials Science and Engineering, University of Tsukuba, 1-1-1 Tennodai, Tsukuba 305-8577, Japan^cLaboratory of Fiber Materials and Modern Textile, The Growing Base for State Key Laboratory, Qingdao University, Qingdao, Shandong 266071, China^dDepartment of Physics and Astronomy, University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-3255, USA**Abstract**

We describe a process of co-reduction to reduce dispersed graphene oxide (GO) and single-walled carbon nanotubes (SWNTs) simultaneously for preparation of hybrid electrodes for graphene supercapacitors. The SWNTs are in between the inter-layer space of graphene sheets as a spacer to prevent effectively restacking of graphene that often limits seriously the electrochemical performance of graphene supercapacitors. The SWNTs also act as conductive binders to improve the electrical conduction of the electrode. A high specific capacitance of 261 F g⁻¹ for a single electrode and specific energy density of 123 Wh kg⁻¹ measured in the two-electrode configuration have been obtained in ionic liquid (EMI-TFSI).

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