
Supporting Information

Nano-Fe₃O₄/Carbon Nanotubes Composites by One-Pot Microwave Solvothermal Method for Supercapacitor Applications

Sul Ki Park ^{1,*}, Jagadeesh Sure ², D. Sri Maha Vishnu ³, Seong Jun Jo ⁴, Woo Cheol Lee ⁴, Ibrahim A. Ahmad ⁵, Hyun-Kyung Kim ^{4,*}

¹ Department of Engineering, University of Cambridge, Cambridge CB3 0FS, UK

² Department of Physics, School of Advanced Sciences, Vellore Institute of Technology (VIT) University, Vellore TN-632014, India; jagadeesh.sure@vit.ac.in

³ Department of Materials Science and Metallurgy, University of Nizwa, Birkat Al Mouz 616, Nizwa, Oman; vishnu@unizwa.edu.om

⁴ Department of Materials Science and Engineering, Kangwon National University, Chuncheon 24341, Korea; runs7777@kangwon.ac.kr (S.J.J.); xndos63@kangwon.ac.kr (W.C.L)

⁵ Department of Materials Science and Metallurgy, University of Cambridge, Cambridge CB3 0FS, UK; ibrahim-ahmad@larsen.com

* Correspondence: sp991@cam.ac.uk (S.K.P.); hkk@kangwon.ac.kr (H.-K.K.); Tel.: +44-(0)-78-564109 (S.K.P.); +82-(0)-33-250-6264 (H.-K.K.)

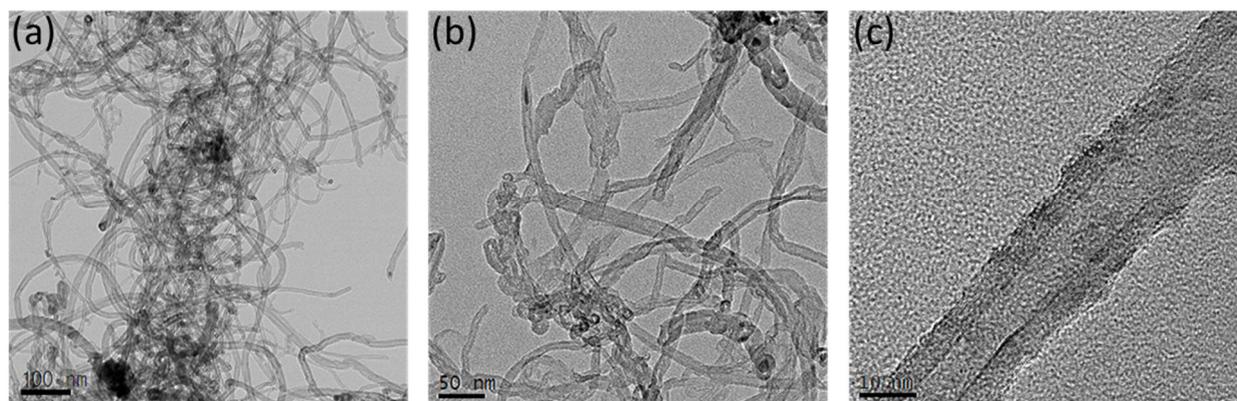


Figure S1. (a) Low, (b) medium, and (c) high magnification TEM images of bare CNTs.

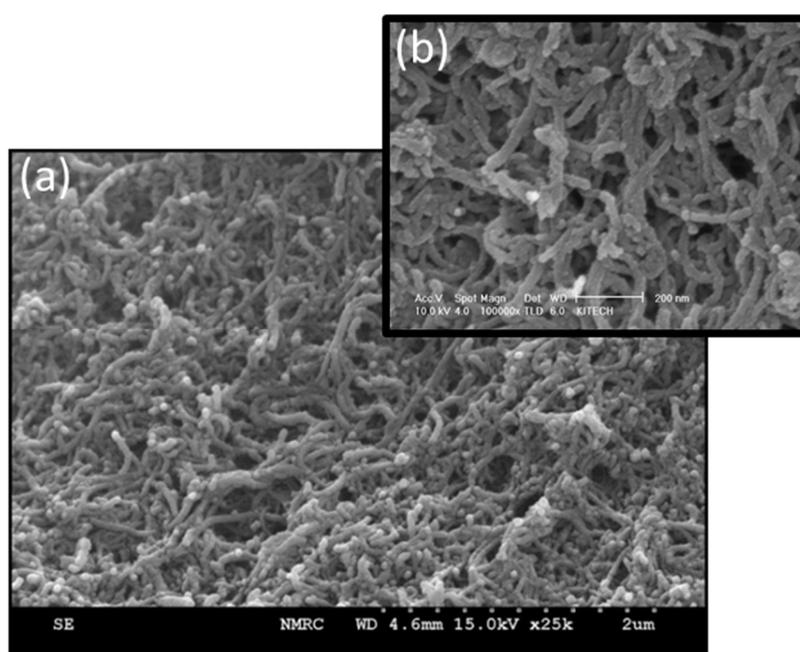


Figure S2. (a) Low and (b) high magnification SEM images of nano- $\text{Fe}_3\text{O}_4/\text{CNT}$ composite.

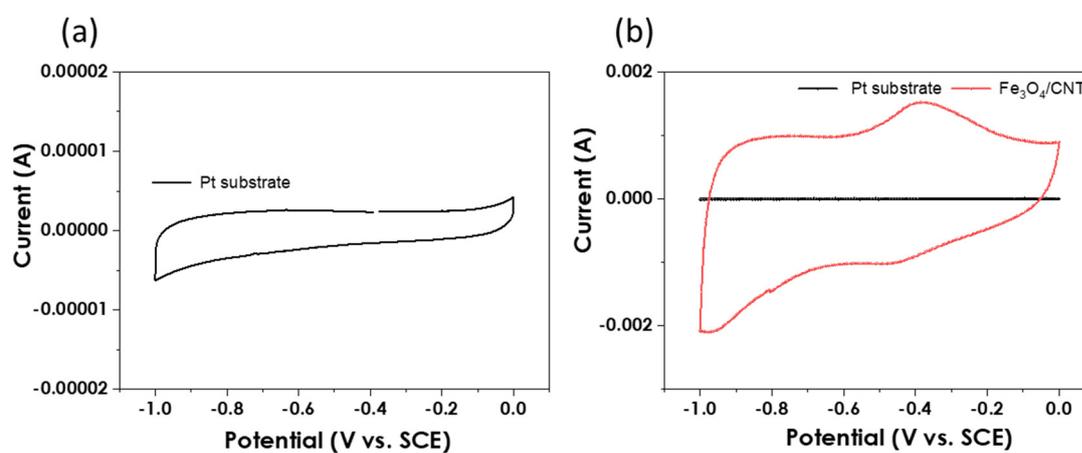


Figure S3. Cyclic voltammograms at scan rate of 10 mV/s of (a) Pt substrate and (b) Pt and nano-Fe₃O₄/CNT composite.

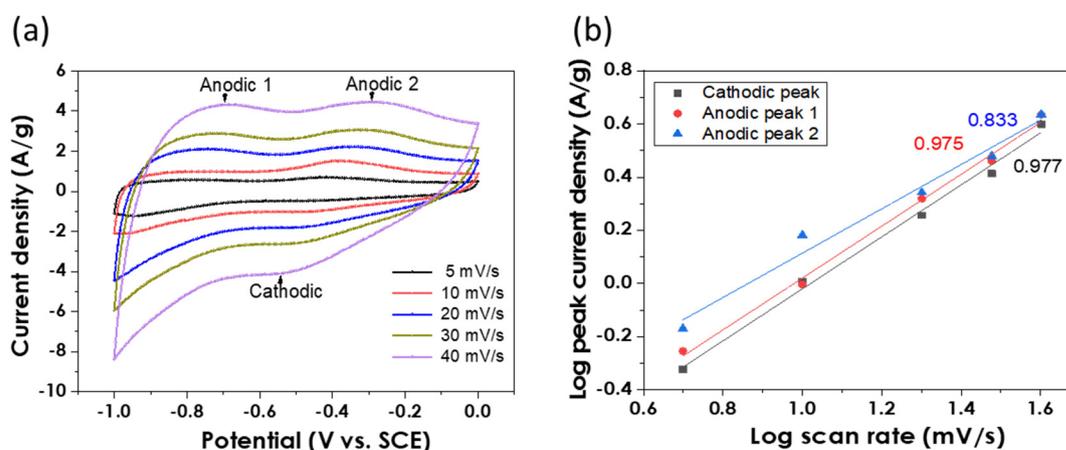


Figure S4. (a) Cyclic voltammograms at scan rates of 5–40 mV/s and (b) log(*i*) vs log(*v*) plots at cathodic and anodic peaks of Fe₃O₄/CNT composite.

Table S1. Comparison of the electrochemical performance of Fe₃O₄/carbon composite in sodium-based electrolyte

Paper	Electrode Materials	Capacity (F/g) in Electrolyte
This study	Fe ₃ O ₄ /CNT	187.1 at 1 A/g
		163.3 at 2 A/g
		145.9 at 3 A/g
		132.6 at 5 A/g
		115.4 at 10 A/g in 1M Na ₂ SO ₃
Roles of nanosized Fe ₃ O ₄ on supercapacitive properties of CNTs [30]	Fe ₃ O ₄ /CNT	165 at 0.2 A/g 132 at 0.5 A/g in 1M Na ₂ SO ₃
Hydrothermal synthesis of carbon nanotube/cubic Fe ₃ O ₄ nanocomposite for enhanced performance supercapacitor electrode material [27].	Fe ₃ O ₄ /reduced graphene oxide (rGO)	154 at 1 A/g 145 at 0.1 A/g in 0.5M Na ₂ SO ₄
High areal capacitance of Fe ₃ O ₄ decorated CNTs for supercapacitor electrodes [31]	Fe ₃ O ₄ /CNT	145.4 at 2 mV/s in Na ₂ SO ₄
Fe ₃ O ₄ /carbon nanocomposite:	Fe ₃ O ₄ /Carbon	136.2 at 1 A/g 50.2 at 5 A/g

investigation of capacitive and magnetic properties for supercapacitor applications
[23]

in 1M Na₂SO₄