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Mechano-chemical Synthesis of Nanostructured $FePO_4$/MWCNTs Composites as Cathode Materials for Lithium-ion Batteries

Hui Dou,[a,b] Ping Nie,[a] and Douglas R. MacFarlane *[b]

[a]College of Material Science and Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China

[b]Australian Centre for Electromaterials Science, Monash University, Clayton, Victoria 3800, Australia.

Fax: +61-3-99054597; Tel: +61-3- 99054540; E-mail: douglas.macfarlane@monash.edu

Table S1 Comparison of the $FePO_4$/MWCNTs with other $FePO_4$/CNTs based materials reported recently.

Procedures	Properties		Performance	References
	Merits	Demerits		
DNA-directed growth	Ultrasmall nanoparticles with size of ~5 nm	1. Complicated process 2. Multi-step 3. Time-consuming 4. Very low pH	132 mAh g^{-1} at 1C 88 mAh g^{-1} at 5C excellent stability	Ref. 1
Aqueous solution-based method	$FePO_4 \cdot H_2O$/carbon nanotube coaxial nanocomposite	Required calcination	157 mAh g^{-1} at 12.5 mA g^{-1} 146 mAh g^{-1} at 625 mA g^{-1} 61 mAh g^{-1} at 15 A g^{-1}	Ref. 2
Aqueous solution-based mineralization	1. Low temperature 2. Core–shell $FePO_4$@MCNT nanowire	1. Complicated process 2. Multi-step 3. Time-consuming 4. Low yield 5. Required calcination	175 mAh g^{-1} at 20 mA g^{-1} excellent stability	Ref. 3
Hydrothermal approach	1. Low temperature 2. One-pot	1. The addition of surfactant 2. With a diameter of 30-300 nm	120 mAh g^{-1} at 10 mA g^{-1} 70 mAh g^{-1} at 20 mA g^{-1} 55 mAh g^{-1} at 60 mA g^{-1} (cathode for sodium-ion batteries)	Ref. 4
Microemulsion technique	1. Nanoparticle with uniform size-distribution 2. Core–shell $FePO_4$@MCNT nanowire	1. The addition of surfactant 2. Complicated process 3. Required calcination	155.2 mAh g^{-1} at 0.1C 133.2 mAh g^{-1} at 0.3C 75.3 mAh g^{-1} at 1C (cathode for sodium-ion batteries)	Ref. 5
Mechano-chemical Synthesis	1. Room temperature 2. Simple process 3. High yield	1. Relatively expensive ionic liquid 2. Without formation of core-shell structure	143 mAh g^{-1} at 40 mA g^{-1} excellent stability	This work

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