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Reduced graphene oxide decorated with FeF₃ nanoparticles: Facile synthesis and application as a high capacity cathode material for rechargeable lithium batteries

By: [Chu, QX](#) (Chu, Qingxin)^[1]; [Xing, ZC](#) (Xing, Zhicai)^[1]; [Ren, XB](#) (Ren, Xinbang)^[1]; [Asiri, AM](#) (Asiri, Abdullah M.)^[2,3]; [Al-Youbi, AO](#) (Al-Youbi, Abdulrahman O.)^[2,3]; [Alamry, KA](#) (Alamry, Khalid Ahmad)^[2,3]; [Sun, XP](#) (Sun, Xuping)^[1,2,3]

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ELECTROCHIMICA ACTA

Volume: 111 Pages: 80-85

DOI: 10.1016/j.electacta.2013.08.006

Published: NOV 30 2013

[View Journal Impact](#)

Abstract

In this paper, we demonstrate the preparation of reduced graphene oxide (rGO) decorated with FeF₃ nanoparticles (FeF₃/rGO) by adding FeF₃ aqueous solution to the rGO ethanol/water dispersion. The obtained FeF₃/rGO nanocomposite is further tested as a cathode material for rechargeable lithium batteries and found to have high discharge capacities, good rate capabilities and cycling performance. It can deliver a high discharge capacity of 476 mAh g⁻¹ at a current density of 50 mA g⁻¹ in the voltage range 1.0-4.5V. It still delivers a discharge capacity of 146 mAh g⁻¹ with 81% capacity retention after 50 charge-discharge cycles under a current density of 1000 mA g⁻¹ in the voltage range 1.7-4.5 V. (C) 2013 Elsevier Ltd. All rights reserved.

Keywords

Author Keywords: [Lithium battery](#); [Cathode](#); [Iron trifluoride nanoparticles](#); [Reduced graphene oxide](#); [Nanocomposite](#)

KeyWords Plus: [METAL FLUORIDE NANOCOMPOSITES](#); [LI-ION BATTERY](#); [IRON FLUORIDE](#); [HIGH-POWER](#); [PERFORMANCE](#); [ELECTRODES](#)

Author Information

Reprint Address: Sun, XP (reprint author)

+ Chinese Acad Sci, Changchun Inst Appl Chem, State Key Lab Electroanal Chem, Changchun 130022, Jilin, Peoples R China.

Addresses:

+ [1] Chinese Acad Sci, Changchun Inst Appl Chem, State Key Lab Electroanal Chem, Changchun 130022, Jilin, Peoples R China

- [2] King Abdulaziz Univ, Fac Sci, Dept Chem, Jeddah 21589, Saudi Arabia
Organization-Enhanced Name(s)
 King Abdulaziz University

- [3] King Abdulaziz Univ, Ctr Excellence Adv Mat Res, Jeddah 21589, Saudi Arabia
Organization-Enhanced Name(s)
 King Abdulaziz University

E-mail Addresses: sunxp@ciac.jl.cn

Funding

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Funding Agency	Grant Number
National Natural Science Foundation of China	21175129
National Basic Research Program of China	2011CB935800
Scientific and Technological Development Plan Project of Jilin Province	20100534

[View funding text](#)

Publisher

PERGAMON-ELSEVIER SCIENCE LTD, THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD OX5 1GB, ENGLAND

Categories / Classification

Research Areas: Electrochemistry

Web of Science Categories: Electrochemistry

Document Information

Document Type: Article

Language: English

Accession Number: WOS:000329531100011

ISSN: 0013-4686

eISSN: 1873-3859

Other Information

IDS Number: 287GX

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Times Cited in Web of Science Core Collection: [24](#)