

Accepted Manuscript

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PII: S1350-4177(18)30477-2

DOI: <https://doi.org/10.1016/j.ultsonch.2018.03.015>

Reference: ULTSON 4128

To appear in: *Ultrasonics Sonochemistry*

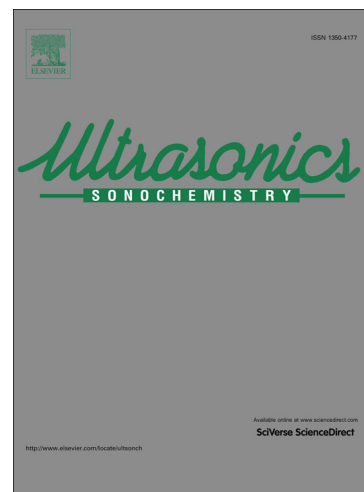
Received Date: 17 November 2017

Revised Date: 17 March 2018

Accepted Date: 24 March 2018

Please cite this article as: K. Wu, D. Liu, W. Lu, K. Zhang, One-pot sonochemical synthesis of magnetite@reduced graphene oxide nanocomposite for high performance Li ion storage, *Ultrasonics Sonochemistry* (2018), doi: <https://doi.org/10.1016/j.ultsonch.2018.03.015>

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**One-pot sonochemical synthesis of magnetite@reduced graphene oxide nanocomposite
for high performance Li ion storage**

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Abstract

In this research, we introduce a one-pot sonochemical method for the fabrication of magnetite@reduced graphene oxide ($\text{Fe}_3\text{O}_4@\text{rGO}$) nanocomposite as anode material for Li-ion batteries. $\text{Fe}_3\text{O}_4@\text{rGO}$ is synthesized under ultrasonic irradiations by using iron (II) salt and GO as raw materials. An in-situ oxidation-reduction occurs between GO and Fe^{2+} during the ultrasonic chemical reaction process. Fe_3O_4 particles with the size of ~20 nm are uniformly deposited on the surface of rGO nanosheets. The electrochemical activity of $\text{Fe}_3\text{O}_4@\text{rGO}$ is systematically evaluated as an anode material in Li-ion battery. Li-ion cells using $\text{Fe}_3\text{O}_4@\text{rGO}$ as electrode deliver high discharge and charge capacities of 1433.6 and 907.8 mAh g^{-1} in the initial cycle at 200 mA g^{-1} . Even performed at 500 and 5000 mA g^{-1} , it is able to deliver reversible capacities of 846.4 and 355.6 mAh g^{-1} , respectively, demonstrating outstanding Li-ion storage performance. This research presents a straightforward and efficient method for the fabrication of $\text{Fe}_3\text{O}_4@\text{rGO}$, which holds great potential in synthesis of other metal oxides on graphene sheets.

Key Words: Sonochemical synthesis; $\text{Fe}_3\text{O}_4@\text{rGO}$; Nanocomposite; Electrochemical

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