Accepted Manuscript

Enhanced ferromagnetism in WS_2 via defect engineering

Xiang Ding, Ting Liu, Sohail Ahmed, Nina Bao, Jun Ding, Jiabao Yi

PII: S0925-8388(18)33326-7

DOI: 10.1016/j.jallcom.2018.09.088

Reference: JALCOM 47507

To appear in: *Journal of Alloys and Compounds*

Received Date: 3 July 2018

Revised Date: 5 September 2018

Accepted Date: 9 September 2018

Please cite this article as: X. Ding, T. Liu, S. Ahmed, N. Bao, J. Ding, J. Yi, Enhanced ferromagnetism in WS_2 via defect engineering, *Journal of Alloys and Compounds* (2018), doi: 10.1016/j.jallcom.2018.09.088.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Enhanced ferromagnetism in WS_2 via defect engineering

Xiang Ding[1], Ting Liu[1], Sohail Ahmed [1], Nina Bao[2], Jun Ding[2], and Jiabao Yi[3*]

[1] *School of Materials Science and Engineering, UNSW, Sydney, NSW, 2052, Australia*

[2] *Department of Materials Science and Engineering, National University of Singapore, 119260, Singapore*

[3] *Global Innovative Centre for Advanced Nanomaterials, School of Engineering, The University of Newcastle, Callaghan 2308, New South Wales, Australia*

Email jiabao.yi@newcastle.edu.au

Abstract

Ferromagnetism in 2D materials have attracted extensive interest recently. Defects has been shown to play a pivotal role in the ferromagnetism based on theoretical calculations. However, there are few experimental results reported and mechanism of ferromagnetism associated with defects are not clear. In this paper, we employ WS_2 powders as an example to study the relationship between defects and magnetism by annealing the powders at reducing atmosphere. Magnetic measurements indicate that pristine WS_2 powders show weak ferromagnetism at room temperature. Compared to pristine WS_2 powder, annealed samples show significant enhancement of magnetization, which is strongly dependent on annealing temperature. The enhanced magnetization is attributed to defects induced by annealing, evidenced by X-ray photoelectron spectroscopy and electron paramagnetic resonance spectroscopy.

Keywords: Transition metal dichalcogenides; Defects; Annealing; Ferromagnetism

ACCEPTED MANUSCRIPT

Download English Version:

https://daneshyari.com/en/article/10156017

Download Persian Version:

https://daneshyari.com/article/10156017

Daneshyari.com