Accepted Manuscript

Magnetic properties of a single iron atomic chain encapsulated inarmchair carbon nanotubes: A Monte Carlo study

R. Masrour, A. Jabar, M. Hamedoun, A. Benyoussef, E.K. Hlil

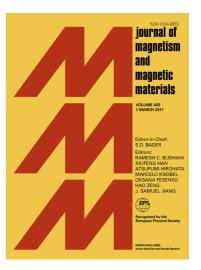
PII: S0304-8853(16)32170-9

DOI: http://dx.doi.org/10.1016/j.jmmm.2017.01.101

Reference: MAGMA 62464

To appear in: Journal of Magnetism and Magnetic Materials

Received Date: 11 September 2016 Revised Date: 9 January 2017 Accepted Date: 29 January 2017



Please cite this article as: R. Masrour, A. Jabar, M. Hamedoun, A. Benyoussef, E.K. Hlil, Magnetic properties of a single iron atomic chain encapsulated inarmchair carbon nanotubes: A Monte Carlo study, *Journal of Magnetism and Magnetic Materials* (2017), doi: http://dx.doi.org/10.1016/j.jmmm.2017.01.101

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

Magnetic properties of a single iron atomic chain encapsulated inarmchair carbon nanotubes: A Monte Carlo study

R. Masrour^{1,*}, A. Jabar¹, M. Hamedoun², A. Benyoussef^{2,3}, E. K. Hlil⁴

Laboratory of Materials, Processes, Environment and Quality, Cady Ayyed University,
National School of Applied Sciences, PB 63 46000, Safi, Morocco.
 Institute of Nanomaterials and Nanotechnologies, MAScIR, Rabat, Morocco.
 Hassan II Academy of Science and Technology, Rabat, Morocco.
 Institut Néel, CNRS et Université Joseph Fourier, BP 166, F-38042 Grenoble cedex 9,
France.

*Corresponding authors: rachidmasrour@hotmail.com

Abstract

The magnetic properties have been investigated of FeCu_xC_{1-x} for a Fe atom chain wrapped in armchair (N,N) carbon nanotubes (N=4,6,8,10,12) diluted by Cu²⁺ions using Monte Carlo simulations. The thermal total magnetization and magnetic susceptibility are found. The reduced transition temperatures of iron and carbon have been calculated for different N and the exchange interactions. The total magnetization is obtained for different exchange interactions and crystal field. The Magnetic hysteresis cyclesare obtained for different N, the reduced temperatures and exchange interactions. The multiple magnetic hysteresis is found. This system shows it can be used as magnetic nanostructure possessing potential current and future applications in permanent magnetism, magnetic recording and spintronics.

Keywords: Carbon nanotubes; Monte Carlo simulations; Reduced transition temperature; Magnetic coercive filed.

Download English Version:

https://daneshyari.com/en/article/5491037

Download Persian Version:

https://daneshyari.com/article/5491037

<u>Daneshyari.com</u>