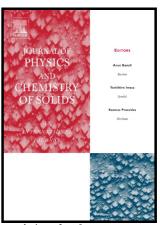
Author's Accepted Manuscript

Metal-semiconductor transition Seebeck and inversion in CoFe₂O₄ nanoparticles

Sunil Kumar, Sandeep Munjal, Neeraj Khare



www.elsevier.com/locate/ipc

PII: S0022-3697(16)31203-3

DOI: http://dx.doi.org/10.1016/j.jpcs.2017.02.003

Reference: PCS7985

Journal of Physical and Chemistry of Solids To appear in:

Received date: 1 December 2016 Revised date: 24 January 2017 Accepted date: 5 February 2017

Cite this article as: Sunil Kumar, Sandeep Munjal and Neeraj Khare, Metal semiconductor transition and Seebeck inversion in CoFe₂O₄ nanoparticles Journal of **Physical** and Chemistry ofSolids http://dx.doi.org/10.1016/j.jpcs.2017.02.003

This is a PDF file of an unedited manuscript that has been accepted fo publication. As a service to our customers we are providing this early version o the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable 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

Metal-semiconductor transition and Seebeck inversion in CoFe₂O₄ nanoparticles

Sunil Kumar¹, Sandeep Munjal², Neeraj Khare^{*}

Department of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, Delhi-

110016, India.

skbgudha@gmail.com

drsandeepmunjal@gmail.com

nkhare@physics.iitd.ac.in

nkhare@physics.iitd.ernet.in

namusciile *Corresponding Author. Cont. +9101126591352

Abstract:

A Semiconductor to metal transition has been observed in hydrothermally synthesized

CoFe₂O₄ (CFO) nanoparticles. Temperature dependent Seebeck coefficient was measured in

order to confirm the type of majority charge carriers and conductivity vs. temperature

measurement was performed to get the activation energy. The CFO nanoparticles shows p-

type semiconducting behaviour at lower temperature as confirmed by the sign of Seebeck

coefficient and at elevated temperatures a sign inversion in Seebeck voltage was observed.

The p-type and n-type semiconducting behaviour have been attributed to hopping of holes

and electrons between Co^{3+} - Co^{2+} and Fe^{2+} - Fe^{3+} respectively dominating at different

temperatures.

¹ Cont. +919460441616

² Cont. +918587089702

Page | 1

Download English Version:

https://daneshyari.com/en/article/5447579

Download Persian Version:

https://daneshyari.com/article/5447579

Daneshyari.com