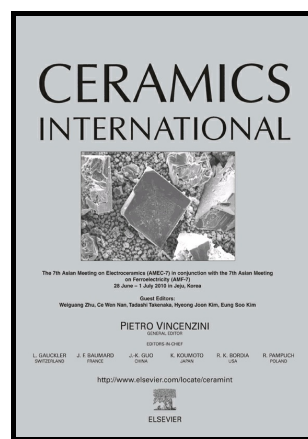


Enhanced magnetic ordering in V, C codoped hierarchical porous ZnO nanograins

P.M. Mohammed Gazzali, Soumya Rajan, G. Chandrasekaran



www.elsevier.com/locate/ceri

PII: S0272-8842(17)32264-2
DOI: <https://doi.org/10.1016/j.ceramint.2017.10.076>
Reference: CERI16495

To appear in: *Ceramics International*

Received date: 6 July 2017
Revised date: 26 September 2017
Accepted date: 12 October 2017

Cite this article as: P.M. Mohammed Gazzali, Soumya Rajan and G. Chandrasekaran, Enhanced magnetic ordering in V, C codoped hierarchical porous ZnO nanograins, *Ceramics International*, <https://doi.org/10.1016/j.ceramint.2017.10.076>

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 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.

Enhanced magnetic ordering in V, C codoped hierarchical porous ZnO nanograins

P.M. Mohammed Gazzali*, Soumya Rajan and G. Chandrasekaran

Department of Physics, Pondicherry University, Puducherry, 605014, India

E-mail: mohammedgazzalifaizee@gmail.com

Abstract

Vanadium doped ZnO macroporous structures are synthesized using solution combustion method. The as-burnt $\text{Zn}_{1-x}\text{V}_x\text{O}$ ($x = 0, 3 \text{ mol } \%$) foams are crushed and ground in agate mortar and pestle and calcined at $450^\circ\text{C}/1 \text{ h}$ for further characterization. The structural study using XRD confirms the wurtzite phase of ZnO having hexagonal structure. The crystallite size is found to decrease from 28 nm to 11 nm on account of addition of vanadium. Grain size and grain boundary modification along with hierarchical porous structures are depicted using SEM micrographs. Further elucidation on the porous nature is made through BET. Quantitative and qualitative determination of intentional and unintentional dopants is estimated. Vibrational spectral studies elucidate the marked role of vanadium's infusion into the lattice and subsequent modification of grain boundary. An order of magnetic enhancement is achieved as illustrated by ambient and low temperature magnetization measurements. Role of vanadium doping on the grain boundary modification are brought to lime-light with structural, morphological and vibrational studies and the same is accounted for the observed magnetic property.

Key words: Combustion synthesis, Porous nanoparticles, Anti-ferromagnetic ordering, Grain boundary, Band gap.

Download English Version:

<https://daneshyari.com/en/article/7888860>

Download Persian Version:

<https://daneshyari.com/article/7888860>

[Daneshyari.com](https://daneshyari.com)