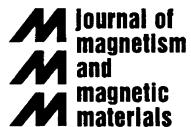




Available online at www.sciencedirect.com



Journal of Magnetism and Magnetic Materials 282 (2004) 321–324



www.elsevier.com/locate/jmmm

Fe-doping effects of ferromagnetic $Zn_{0.98-x}Fe_{0.02}Mg_xO$ semiconductor

Seung-Iel Park, Geun Young Ahn, In-Bo Shim, Chul Sung Kim*

Department of Physics, Kookmin University, Seoul 136-702, South Korea

Available online 3 May 2004

Abstract

The X-ray diffraction patterns of the $Zn_{0.98-x}Fe_{0.02}Mg_xO$ ($x = 0, 0.05, 0.1, 0.2$) powders showed no detectable MgO peaks for $x \leq 0.1$, whereas clear MgO peaks for $x = 0.2$. All the peaks for the X-ray diffraction patterns of $x \leq 0.1$ samples belong to the hexagonal ($P6_3mc$) lattice of ZnO. The hysteresis curve at 77 K for the $Zn_{0.88}Mg_{0.1}Fe_{0.02}O$ indicated the coexistence of both a paramagnetic and a ferromagnetic phases. The temperature dependence of magneto-resistance curve shows semiconductor behavior over 220 K.

© 2004 Elsevier B.V. All rights reserved.

PACS: 61.10.-I; 75.50.Pp; 76.80.+y

Keywords: ZnO; MgO; Fe doping; Ferromagnetic; Semiconductor; Mössbauer
