

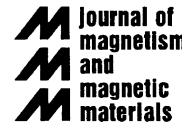


ELSEVIER

Available online at www.sciencedirect.com

SCIENCE @ DIRECT®

Journal of Magnetism and Magnetic Materials 290–291 (2005) 1551–1554



www.elsevier.com/locate/jmmm

Synthesis and magnetic properties of LiFe_5O_8 powders by a sol–gel process

Sung Yong An, In-Bo Shim, Chul Sung Kim*

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

Available online 9 December 2004

Abstract

LiFe_5O_8 ferrite has been prepared by a sol–gel method. The crystal structure was found to be cubic spinel structure with a lattice constant $a = 0.8336$ nm. LiFe_5O_8 powders that were annealed at and above 1173 K have a single-phase spinel structure. However, powders annealed at 973 and 1073 K have a typical spinel structure with small amount of hematite ($\alpha\text{-Fe}_2\text{O}_3$) phase. The Néel temperature of LiFe_5O_8 was $T_N = 905 \pm 3$ K. The isomer shift values at room temperature for the *A* and *B* patterns are found to be 0.18 and 0.21 mm/s relative to the Fe metal, respectively, which are consistent with high-spin Fe^{3+} charge states. The saturation magnetization M_S was 64.4 emu/g at room temperature under the applied magnetic field of 10 kOe after annealing at 1273 K in air atmosphere for 6 h.

© 2004 Elsevier B.V. All rights reserved.

PACS: 74.25.Ha; 75.50.Gg; 76.80.+y

Keywords: Lithium iron oxide; Sol–gel method; Mössbauer spectroscopy
