

## Effect of Substituting Potassium in Ordered Li-Ferrites by on Its Magnetic Properties

Seung Je MOON, Sam Jin KIM and Chul Sung KIM\*

*Department of Physics, Kookmin University, Seoul 136-702*

(Received 29 November 2007)

Ordered  $\alpha$ -Li<sub>1-x</sub>K<sub>x</sub>FeO<sub>2</sub> ( $x = 0.00, 0.05, 0.07$  and  $0.10$ ) powders were prepared by using a sol-gel method. The  $\alpha$ -Li<sub>1-x</sub>K<sub>x</sub>FeO<sub>2</sub> single-phases are observed in the samples annealed at 650 °C for 3 hrs in air. The crystal structure of  $\alpha$ -Li<sub>1-x</sub>K<sub>x</sub>FeO<sub>2</sub> is found to be cubic with a lattice constant in the range for on  $a = 4.1615 \pm 0.0005 \text{ \AA}$  to  $4.1600 \pm 0.0005 \text{ \AA}$ , which changes with the amount of K (potassium). The Néel temperatures of  $\alpha$ -Li<sub>1-x</sub>K<sub>x</sub>FeO<sub>2</sub> is about  $T_N = 97 \pm 5 \text{ K}$ . The isomer shift at 4.2 K is found to be about 0.36 mm/s relative to the Fe metal, which is consistent with high-spin Fe<sup>3+</sup> charge states.

PACS numbers: 75.50.Ee, 84.60.Dn

Keywords: Mössbauer spectroscopy, Recharge battery, Lithium ferrite