ABSTRACTS

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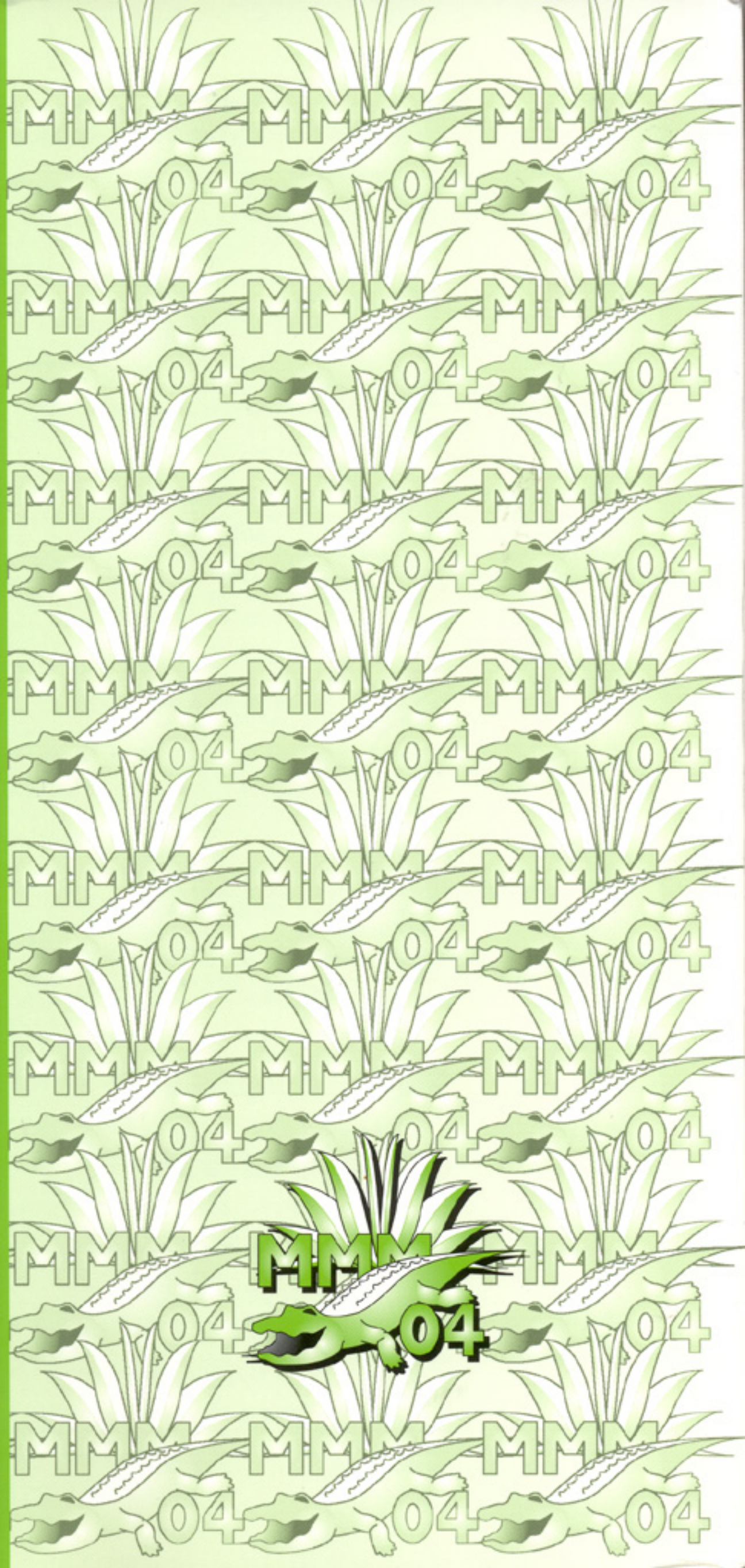

BP-12. Order-disordered structure and magnetic properties of Li0.5Fe2.5-xRhxO4. *K. Kang*[1], H. Oak[2] and C. Kim[1] *1. Department of Physics, Kookmin University, Seoul, South Korea; 2. Department of Physics, Yonsei University, Seoul, South Korea*

Rh-substituted lithium ferrites $Li_{0.5}Fe_{2.5-x}Rh_xO_4$ (x = 0.25 ~ 1.50) have been studied by Mössbauer spectroscopy, SQUID magnetometry, and x-ray diffraction. In order to investigate the crystal structure, x-ray diffraction patterns were analyzed by Rietveld refinement method. The crystals are found to have a cubic spinel structure and have been classified into two different sets. For the samples (x = 0.25 ~ 1.25), all reflections can be indexed according to the space group Fd3m. The x-ray pattern of x = 1.50 is characterized by the additional reflection (200) and can be assigned to the space group F43m. The lattice constant a_0 increase non-linearly with increasing Rh concentration x, because of the migration of Li ion from the octahedral site to the tetrahedral site in the range x = 0.75 ~ 1.25. The migration of Li ion has been confirmed by the result of Mössbauer analysis with 60 kOe external fields. To obtain the cation distribution of Fe, the temperature dependence of the absorption area of each site was analyzed with the Debye model for the recoil-free fraction. The fraction of irons at the A site is 1.00 for x = 0.25, 0.50, and 0.88, 0.73, 0.57 for x = 0.75, 1.00, 1.25 respectively. The Néel temperature determined by the Mössbauer spectra without applied magnetic field is 760 ± 3 K for x = 0.25, decreases monotonically with decreasing Rh concentration down to 260 ± 3 K for x = 1.50. The saturated magnetic moment measured at liquid helium temperature and Mössbauer spectra taken with 60 kOe applied field show that the spin structure of $Li_{0.5}Fe_{2.5-x}Rh_xO_4$ has the collinear Néel Model.