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ABSTRACTS

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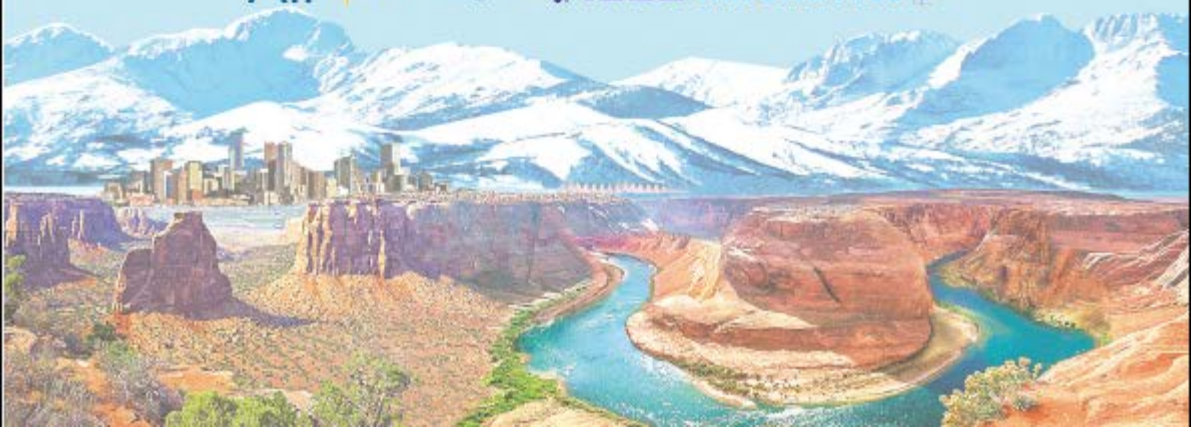

CX-05. Magnetic properties of Zn doped Co_2Y hexaferrite by using high-field Mössbauer spectroscopy. *J. Lim*[1], H. Noh[1] and C. Kim[1] *1. Physics, Kookmin University, Seoul, Republic of Korea*

The polycrystalline samples of $Ba_2Co_{2-x}Zn_xFe_{12}O_{22}$ (x = 0.5, 1.0, 1.5) were synthesized by using a solid-state-reaction method. From the XRD patterns analyzed by Rietveld refinement, we confirmed to be single-phased with rhombohedral structure (*R-3m*). The unit cell volume (V_u) of samples increased with increasing Zn ion concentration, because Fe^{3+} ions are transferred from tetrahedral sites to octahedral sites. The magnetic properties of samples were investigated with vibrating sample magnetometer (VSM), and Mössbauer spectroscopy. Base on the applied-field dependent hysteresis curves up to 10 kOe at various temperatures, saturation magnetization (M_s) of samples increased with increasing Zn ion concentration because the non-magnetic Zn ions preferentially occupy the tetrahedral sublattices with down-spin site. Also, from the 295 K, the coercivity (H_c) of $Ba_2Co_{2-x}Zn_xFe_{12}O_{22}$ (x = 0.5, 1.0, 1.5) samples were found to be H_c = 153.0, 103.8, 61.1 Oe, respectively. The decrease in H_c is due to decreasing Co ion concentration of high magnetic anisotropy. Base on the zero-field-cooled (ZFC) and field-cooled (FC) magnetization curves under 100 Oe between 4.2 and 740 K, all samples were found to have spin transition (T_s) from helicalmagnetic order to ferrimagnetic order. With increasing Zn ion concentration, the T_s and Curie temperature (T_C) of samples decrease linearly. We have obtained Zero-field Mössbauer spectra of all samples at various temperatures ranging from 4.2 to 650 K, and analyzed the spectra below T_C as six-sextets for Fe sites. Isomer shift values of all samples indicate that the charge states are Fe^{3+}. From the temperature dependence of hyperfine field (H_{hf}), we have observed an abrupt change in H_{hf} at T_s. In addition, Mössbauer spectra of all samples at 4.2 K were taken with applied field ranging from 0 to 50 kOe. As a result, the canting angle between applied field and H_{hf} of samples decreased with increasing Zn concentration.

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