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Debottam Daw*,**, Riya Sebait*,**, Chandan Biswas*, Young Hee Lee*,**
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*(*Chungbuk national university, **Daegu Gyeongbuk Institute of Science & Technology, ***Chungbuk National University, ****Ulsan National Institute of Science and Technology, *****Hankuk University of Foreign Studies,)*

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*(*Korea Institute of Science and Technology, **KyungHee University)*

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*(*Korea Institute of Science and Technology, **Korea University, ***Yeungnam University)*

TUE-SM19-299 **Neutron diffraction of Y-type hexaferrite Ba2Co2-xZnxFe12O22 (x=0.5, 1.0, 1.5, 2.0)**
Jeonghun Kim*, Jung Tae Lim**, Sam Jin Kim*, Chul Sung Kim*
*(*Kookmin University, **Korea Institute of Materials Science)*

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Hyunkyung Choi*, Minseon Kim*, Hyung Joon Kim**, Sung Baek Kim***
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Neutron diffraction of Y-type hexaferrite $Ba_2Co_{2-x}Zn_xFe_{12}O_{22}$ (x=0.5, 1.0, 1.5, 2.0)

Jeonghun Kim[1], Jung Tae Lim[2], Sam Jin Kim[1], Chul Sung Kim[1]

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We studied crystallographic, magnetic structure and magnetic properties of polycrystalline Y-type hexaferrite $Ba_2Co_{2-x}Zn_xFe_{12}O_{22}$ (x = 0.5, 1.0, 1.5, 2.0). The samples were prepared by using the solid-state reaction method. High-purity oxides were used as starting materials and were produced by one calcination at 1000 ^oC and one sintering at 1100 ^oC. The neutron diffraction patterns were obtained at Korea Atomic Energy Research Institute HANARO HRPD (high resolution powder diffractometer, λ = 1.8348 Å) reactor. The x-ray diffraction and neutron diffraction patterns obtained at room temperature were refined by using the Rietveld refinement method with FULLPROF program. In particular, the neutron diffraction patterns of $Ba_2Co_{2-x}Zn_xFe_{12}O_{22}$ (x=2.0) sample were measured from 298 to 573 K. The crystallographic structure of $Ba_2Co_{2-x}Zn_xFe_{12}O_{22}$ was confirmed to be rhombohedral with the space group R-3m. The lattice constants (a_0, c_0) and unit cell volume of samples were increased increasing Zn contents by refined x-ray diffraction and neutron diffraction patterns. From neutron diffraction patterns of $Ba_2Zn_2Fe_{12}O_{22}$ sample at various temperatures, the diffraction peaks intensity of magnetic phase, as seen in the super-lattice peak at 21.8^o and 23^o, was decrease as temperature increases due to decreasing thermal agitation, and it could be seen that it is a magnetic phase which disappears completely from the temperature range above Curie temperature. Curie temperature was the same result as the determination of Curie temperature in our previous study.