Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Electronic structures of (Rb,Ba)Mn[Fe(CN)$_6$] Prussian blue analogue EUNSOOK LEE, D.H. KIM, HYUN WOO KIM, SEUNGHO SEONG, Department of Physics, The Catholic University of Korea, S.M. YUSUF, Solid State Physics Division, Bhabha Atomic Research Centre, BONGJAE KIM, B.I. MIN, Department of Physics, POSTECH, J.-S. KANG, Department of Physics, The Catholic University of Korea — $A_nM[M'(CN)_6]_m \cdot xH_2O$-type (A: alkali-metal ion; M, M′: transition-metal ion) Prussian blue analogues (PBAs) have been studied extensively since the discovery of photo-induced spin transition in PBA.[1] In the (Rb,Ba)Mn[Fe(CN)$_6$]-type PBAs, antiferromagnetic to ferrimagnetic-like phase transitions were observed below ~ 5 K under magnetic field.[2] However, the mechanism of such magnetic transitions is controversial. In this work, we have investigated the electronic structures of (Rb,Ba)Mn[Fe(CN)$_6$] PBAs by employing soft X-ray absorption spectroscopy (XAS), soft X-ray magnetic circular dichroism (XMCD), and charge transfer multiplet (CTM) calculation. The measured XAS and XMCD spectra reveal different bonding characters for Fe and Mn ions, respectively. In the CTM calculation, both the metal-to-ligand charge transfer and the ligand-to-metal charge transfer are found to be necessary. We will discuss on the role of their electronic structures in their phase transitions.

[1]O. Sato et al, Science **272**, 704 (1996).
[2]A. Thakur et al, J. Appl. Phys. **111**, 063908 (2012).

Eunsook Lee
Department of Physics, The Catholic University of Korea

Date submitted: 06 Nov 2016 Electronic form version 1.4