



The 9<sup>th</sup> International Conference on Advanced Materials and Devices

# ICAMD 2015

**December 7~9, 2015** Ramada Plaza Jeju Hotel, Jeju, Korea

## Organized by

Applied Physics Division, The Korean Physical Society

Center for Integrated Nanostructure Physics,  
Institute for Basic Science

Quantum Metamaterials Research Center

CNRS-Ewha International Research Center (CERC)

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Po-Na15-120

Broadband coherent perfect absorption of epsilon-near-zero tunable indium tin oxide thin films in the near infrared

Chang Kwon Hwangbo\*, Tae Young Kim\*, Md. Alamgir Badsha\*, Junho Yoon\*, Seonyoung Lee\*, Wonyoung Kim\*, Young Chul Jun\*\*

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Po-Na15-121

Nanostructure Formations by Irradiating Ions to Carbon Nanotubes on Polymer Substrates

Woongbin Yim, Huiseong Jeong, S.J. Park, Y.H. Ahn, Soonil Lee, Ji-Yong Park

(Ajou University)

## Spin and Magnetism

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Po-SP15-017

Self-heating effects of FeCo fluids by alternative magnetic fields

Ki Hyeon Kim, Jinu Kim, Joonsik Lee, Baekil Nam

(Yeungnam University)

Po-SP15-018

Spin reorientation in Mg doped Y-type hexaferrite investigated by Mossbauer spectroscopy

Jung Tae Lim, Taejoon Kouh, Chul Sung Kim

(Kookmin University)

Po-SP15-019

Crystal and magnetic properties of  $\text{Na}_{0.99}\text{Li}_{0.01}\text{FeSO}_4\text{F}$  by using Mossbauer spectroscopy

Hyunkyung Choi, Soyeon Barng, Sam Jin Kim, Bo Wha Lee\*\*, Chul Sung Kim

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Po-SP15-020

Magnetic properties of cathode material  $\text{Li}_{0.3}\text{Na}_{0.2}\text{FePO}_4$  with Mossbauer spectroscopy

Byung Ug Ko\*, Mun Hwan Kim\*\*, Jung Chul Sur\*\*\*, In-bo Shim\*, Chul Sung Kim\*

(\*Kookmin University, \*\*Dongjin Semichem, \*\*\*Wonkwang University)

## **Crystal and magnetic properties of $\text{Na}_{0.99}\text{Li}_{0.01}\text{FeSO}_4\text{F}$ by using Mössbauer spectroscopy**

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The Sodium-ion battery is the focus of much research in relation to fluorosulfate materials.[1]  $\text{Na}_{0.99}\text{Li}_{0.01}\text{FeSO}_4\text{F}$  polycrystalline powder was prepared by the ionothermal method. The crystal structure was determined to be monoclinic with space group  $P2_1/c$  and the lattice constant were analyzed from Rietveld refinement. The magnetic properties were characterized zero field cooled (ZFC) and field cooled (FC) ranging from 4.2 to 295 K by vibrating sample magnetometer (VSM). We was observed antiferromagnetic behavior below the Néel temperature ( $T_N = 33$  K) and its shows paramagnetic behavior above  $T_N$ . Also, we was confirmed magnetic property by using Mössbauer spectrometer. Mössbauer spectra of  $\text{Na}_{0.99}\text{Li}_{0.01}\text{FeSO}_4\text{F}$  measured various temperatures ranging 4.2 to 295 K. The magnetic Néel temperatures by these spectra was determined to be 33 K from the temperature dependent Mössbauer spectra. The Mössbauer spectra at 295 K for  $\text{Na}_{0.99}\text{Li}_{0.01}\text{FeSO}_4\text{F}$  composed one-doublet. The two-sets of asymmetric 8-absorption lines in the Mössbauer spectra were analyzed below  $T_N$ . At all temperature, from 4.2 to 295 K, the isomer shift value ( $\delta$ ) of  $\text{Na}_{0.99}\text{Li}_{0.01}\text{FeSO}_4\text{F}$  was analyzed at  $\text{Fe}^{2+}$  state.

[1] Z. Yuan, D. Wei, Y. Wnag, Y. Zhu, Y. Qian and K. Tang, *CrystEngComm*, **14**, 4251 (2012).