

EB04

### Thermodynamic Properties of Multiferroic $\text{Eu}_{1-x}\text{Sr}_x\text{MnO}_3$ Compounds

Renu Choithrani\* and N. K. Gaur

Department of Physics, Barkatullah University, Bhopal (MP) - 462 026, India

\*Corresponding author. E-mail address: renuchoithrani@gmail.com (Renu Choithrani\*)

We have described the thermodynamic properties of Multiferroic  $\text{Eu}_{1-x}\text{Sr}_x\text{MnO}_3$  compounds using the Modified Rigid Ion Model (MRIM) in the temperature range  $2\text{K} \leq T \leq 300\text{K}$ . The trends of variation of the computed specific heat with temperature are similar to those exhibited by the experimental results. In addition, we have computed the cohesive energy, molecular force constant, compressibility, Restrahlen frequency, Debye temperature, and Grüneisen parameter of these compounds. The results obtained on them from MRIM have been discussed in detail.

PACS Code: 75.47.Lx; 74.25.Bt; 75.80.+q

Keywords: Thermodynamic properties; Manganites; CMR materials; Specific heat; Debye temperature.

EB05

### Magnetodielectric Effect Induced by a Non-collinear to Collinear Spin Structure Transition

K. M. Song<sup>1</sup>, S. M. Lee<sup>1</sup>, M. H. Jung<sup>2</sup>, J. Cho<sup>3</sup>, and N. Hur<sup>1\*</sup>

<sup>1</sup>Department of Physics, Inha University, Incheon 402-751, Korea

<sup>2</sup>Department of Physics, Sogang University, Seoul 121-742, Korea

<sup>3</sup>Quantum Material Research Team, Korea Basic Science Institute, Daejeon 305-333, Korea

\*Corresponding author: N. Hur, e-mail: nhur@inha.ac.kr

The Correlation between the magnetodielectric effect and the magnetic structure in  $\text{RE}_3\text{Fe}_5\text{O}_{12}$  ( $\text{RE}=\text{Tb}, \text{Dy}$ ) single crystals will be discussed in this presentation. We have investigated the magnetic transitions and their effects on the magnetodielectric effect in  $\text{RE}_3\text{Fe}_5\text{O}_{12}$  single crystals. It has been suggested that the magnetodielectric effect is mainly related to magnetostriction in the case of  $\text{Tb}_3\text{Fe}_5\text{O}_{12}$  [1]. However the magnetodielectric effect in other iron garnets with different rare earth has not been investigated. Possible origins of the magnetodielectric effect will be discussed in connection with the magnetic structure transition as well as magnetostriction.

#### REFERENCES

[1] N. Hur, *et al.* Appl. Phys. Lett. 87, 42901 (2005).

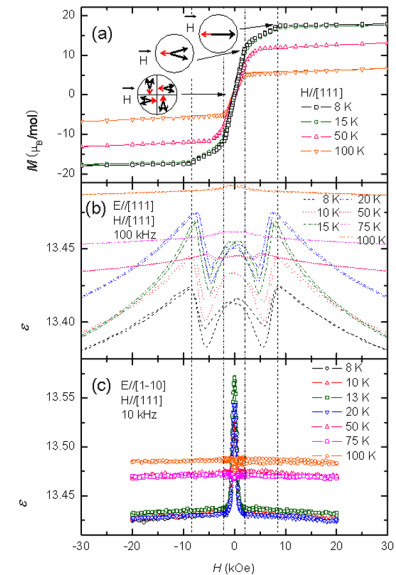


Fig. 1. Correlation between the magnetization and the magnetodielectric effect in  $\text{Dy}_3\text{Fe}_5\text{O}_{12}$ .