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BiFeO₃ Layer Thicknesses Effect on Magnetocaloric Effect in BiFeO₃|La_{0.7}Sr_{0.3}MnO₃ Thin Films

© M.A. Hamad¹, O.M. Hemeda², H.R. Alamri³, M.E. Harb⁴, A.M. Mohamed⁵

¹ Basic Science Department, Higher Institute of Engineering and Technology, Alexandria, Egypt

² Physics Department, Faculty of Science, Tanta University, Tanta, Egypt

³ Physics Department, Aljamoum University College, Umm Al-Qura University, Makkah 21955, Saudi Arabia

⁴ Department of Communications and Electronics Engineering, Higher Institute of Engineering and Technology, Alexandria, Egypt

⁵ National Research Centre, 12622 Dokki, Cairo, Egypt

E-mail: m_hamad76@yahoo.com

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The magnetocaloric effect (MCE) of BiFeO₃ (BFO)|La_{0.7}Sr_{0.3}MnO₃ (LSMO) thin films was investigated via phenomenological model. It is revealed that the values of magnetic entropy change, temperature range covering MCE, change of specific heat, and relative cooling power of BFO|LSMO films decrease dramatically with an increase of BFO. The simulation shows furthermore that these BFO|LSMO films have prospective importance in magnetic refrigerants over a wide temperature range, including cryogenic and room temperatures. The MCE parameters of BFO|LSMO films are significantly larger and comparable with some MCE ones of magnetic materials in previous works.

Keywords: BiFeO₃|La_{0.7}Sr_{0.3}MnO₃, magnetocaloric effect, magnetic entropy change.