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# Pr modified structural, magnetic and magnetocaloric properties of Nd1.4-xPrxSr1.6Mn2O7 nanostructures

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The Ruddlesden-Popper (R-P) perovskites have become a subject of intense interest in the recent years due to their fascinating physical properties such as enhanced magnetoresistance, charge ordering and large magnetocaloric effect. These materials hold great promise for applications as active agents in magnetic refrigeration. In the present work, we report the structural, magnetic and magnetocaloric properties of the Nd<sub>1.4-x</sub>Pr<sub>x</sub>Sr<sub>1.6</sub>Mn<sub>2</sub>O<sub>7</sub> (x = 0.0, 0.05, 0.1, 0.15 and 0.20) samples. The polycrystalline samples were prepared using the standard solid state reaction method. The structure and microstructure of the sintered pellets were investigated by X-ray diffraction (XRD) and scanning electron microscopy (SEM). The XRD analysis confirmed the formation of the tetragonal structure with I4/mmm space group in all the fabricated samples. The temperature dependent magnetization and Arrott analysis confirmed the second order of magnetic phase transition in all the samples at the Curie temperature (TC). A magnetocaloric effect in terms of maximum magnetic entropy change was also studied through the examination of measured magnetic isotherms near TC. The high magnetocaloric effect obtained in terms of magnetic entropy change and relative cooling power (RCP) for the samples investigated here suggests that these materials can be used as potential candidate materials for magnetocaloric applications.

#### Biography

Hyung Uk Lee has a Degree in Materials Science and Engineering from Changwon University at and is now pursuing a Master's Degree from the Material Engineering Department of Changwon University. He is studying the magnetocaloric effect of a nanoscale magnetic material made of a powerful planetary ball mill and conducting research to form a high quality coating layer using nano powder. He has participated in many conferences.

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