Perovskite manganites: potential materials for magnetic cooling at or near room temperature

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Perovskite manganites are known as functional materials showing colossal magnetoresistance and are used as magnetic sensors. We report on the synthesis and characterization of La0.67Ca0.33MnO3, La0.67Sr0.33MnO3, and La0.67Ba0.33MnO3 polycrystalline bulk materials. Detailed measurements of the magnetization as function of temperature and magnetic field for these samples were carried out. Significant entropy changes near the Curie temperatures are obtained from the magnetization data. The specific heat changes of these samples near their phase transition temperatures are derived from magnetic measurements. Our results and the relevant data from various references are summarized. Furthermore the magnetocaloric effects and potential applications in magnetic cooling of perovskite manganite materials are evaluated.