

Structural and temperature coefficient of resistance characteristics of colossal magnetoresistance Mn oxides prepared by RF sputtering

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Abstract : A lot of efforts have been paid to develop infrared imaging systems in last decades. Bolometer has a wide range of applications from military to commercial, such as military night vision, medical imaging system and so on. Bolometer is a resistive sensor that detects temperature changes through resistance change. To improve detecting ability, bolometer should have a good resistive film which has high temperature coefficient of resistance (TCR) value. Colossal magnetoresistance (CMR) $L_{1-x}A_xMnO_3$ (where L and A are trivalent rare-earth ions and divalent alkaline earth ions, respectively.) are received attention to apply bolometer resistive film because it has a high TCR property which was discovered in the metal to semiconductor phase transition temperature region. In this work, CMR films were deposited on various substrates in relative low substrate temperature by RF magnetron sputtering. The influence of deposition parameters such as substrate temperature, gas partial pressure, and so on have been studied. The structural and TCR properties of the films were also investigated for applying to microbolometer.

Key Words : CMR, bolometer, TCR, sputtering, low temperature