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Thermal analysis and evidence of structural transition induced by praseodymium in $SrTiO_3$ *ALEJANDRO DURAN, **FRANCISCO MORALES, IIM-UNAM, ***LUIS FUENTES, +JAVIER CASTRO, *JESUS SIQUEIROS, *Centro de Ciencias de la Materia Condensada-UNAM, **IIM-UNAM, ***CIMAV-Chihuahua, Chih. MEXICO, +UACJ-Ciudad Juarez, Chih. MEXICO
— To explore the nature of ferroelectric behavior induced by Pr ion in the $SrTiO_3$ ceramic, we brought together a combination of Synchrotron x-ray powder diffraction and thermal analysis. Rietveld analysis shows a clear peak splitting strongly suggesting a cubic-tetragonal structural transition when 15 % Pr substitutes the Sr site. To determine the temperature of the structural instability differential thermal analysis at high temperatures (30-900 °C) and specific heat at low temperatures (2-300 K) were performed. The difference in the heat capacity for Pr doped and undoped samples is very small. A plateau in Cp/T-T at 110 K is a clear evidence of the competing effect of two kinds of order parameters, one represented by the polarization and the other by the rotation of the oxygen octahedral in the perovskite structure. Upon heating, DTA analysis shows an unexpected single endothermal broad anomaly at about 118 °C. The occurrence of this thermal anomaly could be related to displacive structural contributions providing unambiguous evidence of diffuse phase transition and of the ferroelectric behavior observed at room temperature. Thanks are due to CONACYT P. 47714-F, DGAPA P. IN100903 and to P. Casillas for technical help.

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