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X-ray diffraction studies of high temperature structural evolution of multiferroic hexagonal HoMnO3 HAIYAN CHEN, JIANMING BAI, YUHAO WANG, TREVOR TYSON, S.-W. CHEONG — Multiferroic rare earth manganites RMnO3 have attracted great attention due to the coexistence of ferromagnetism and ferroelectricity plus the giant coupling between them. High temperature structural evolution of hexagonal RMnO3 is of great interest in the elucidation of ferroelectric properties of this class of materials. In this study, synchrotron powder X-ray diffraction has been used to investigate the phase transitions of hexagonal HoMnO3 from room temperature to 1400 K. Preliminary results have shown positive thermal expansion for lattice a and negative thermal expansion for lattice c. A phase transition from non-centrosymmetric to centro-symmetric structure was observed around 1250 K. Rietveld analysis of the XRD data to reveal more structural detail is in progress. This work is supported by DOE Grant DE-FG02-07ER46402 and NSF Instrumentation grant DMR MRI-0722730.

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