

Abstract Submitted
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Pressure Dependence of Structure Stability of Multiferroic Hexagonal-RMnO₃¹ ZHIQIANG CHEN, PENG GAO, TREVOR. A. TYSON, Department of Physics, New Jersey Institute of Technology, ZHENXIAN LIU, Geophysical Laboratory, Carnegie Institution of Washington, JINZHU HU, X17 of NSLS, CARS, University of Chicago, Upton, NY, CHENGLIN ZHANG, SUNG-BAEK KIM, SANG-WOOK CHEONG, Dept. of Physics and Astronomy, Rutgers University — We present high pressure IR and X-ray diffraction measurements of the hexagonal multiferroic systems HoMnO₃, YMnO₃ and LuMnO₃. Measurements were conducted over the pressure range ambient to ~20 GPa. No phase changes were observed over this broad range of hydrostatic pressures. These suggest that the hexagonal structure is stable at higher pressures. The thermal treatment is necessary to overcome the barrier (breaking and reconnection of bonds) to achieve the hexagonal to orthorhombic phase change. A discussion of the effect of hydrostatic pressure on the ferroelectric properties of these systems will be given based on comparisons with density functional calculations.

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