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Multiple Magnetic Transitions and Magnetocaloric Effect in (La,Pr,M)MnO_3 (M = Ca, Sr, Ba) Mixed Phase Manganites[1] P.J. LAMPEN, N.S. BINGHAM, M.H. PHAN, H.S. SRIKANTH, University of South Florida, T.L. PHAN, S.C. YU, Chungbuk National University, S.W. CHEONG, Rutgers University — The manganite compound (La,Pr,Ca)MnO_3 is a well-studied system that is known to exhibit a complex phase diagram featuring "strain liquid" and "strain glass" regions in combination with competing ferromagnetic (FM) and charge-ordered antiferromagnetic (CO/AFM) phases. The balance of these phases is sensitive to various perturbations including magnetic and electric field, strain, bandwidth, and A-site cation disorder. The A-site disorder and bandwidth of this compound can be tuned through the replacement of Ca with larger Sr and Ba ions. We report here a systematic study of the influence of cation substitution on the magnetic and magnetocaloric properties of $La_{0.35}Pr_{0.275}M_{0.375}MnO_3$ (M = Ca, Sr, Ba). Structural properties, including lattice parameters and Mn–O–Mn bond angles, were determined from X-ray diffraction patterns. DC magnetometry studies reveal multiple magnetic transitions in each sample which are probed by magnetocaloric effect (MCE) and transverse susceptibility (TS) experiments. Increasing the average A-site cationic radius is found to strongly impact the magnetic properties and phase behavior of the system.

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