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Giant Magnetoelectric Effect in Antiferromagnetic $BaMnO_{3-\delta}$ and Its Derivatives[1] M. GE, O.B. KORNETA, T.F. QI, S. PARKIN, L.E. DELONG, G. CAO, University of Kentucky, P. SCHLOTTMANN, Florida State University — Hexagonal perovskite 15R-$BaMnO_{2.99}$ with a ratio of cubic to hexagonal layers of 1/5 in the unit cell is an antiferromagnetic insulator that orders at a Néel temperature T_N= 220 K. Here we report structural, magnetic, dielectric and thermal properties of single crystal $BaMnO_{2.99}$ and its derivatives $BaMn_{0.97}Li_{0.03}O_3$ and $Ba_{0.97}K_{0.03}MnO_3$. The central findings of this work are: **(1)** these materials possess a usually large, high-temperature magnetoelectric effect that amplifies the dielectric constant by more than an order of magnitude near their respective Néel temperature; **(2)** Li and K doping can readily vary the ratio of cubic to hexagonal layers and cause drastic changes in dielectric and magnetic properties. These findings provide a new paradigm for developing *novel*, *high-temperature magnetoelectric materials* that may eventually contribute to technology.

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