The Pressure Effect on the Ferroelectricity in Multiferroic
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ian Academy of Sciences — The effect of isotropic pressure ($P$) up to 1.7 GPa on the
magnetic and ferroelectric phase diagram of $RMn_2O_5$ ($R=\text{Tb, Dy, Ho}$) is investi-
gated. Distinctive anomalies of the $b$-axis dielectric constant identifying the critical
temperatures for the various magnetic and ferroelectric transitions are monitored as
a function of $P$ and the temperature-pressure phase diagram of multiferroic $RMn_2O_5$
was constructed. The magnetic and ferroelectric orders are stabilized under pressure
and their respective onset temperatures increase with $P$. Most notably, the step-like
change of the dielectric constant at lower temperatures ($T_{C_2}$) that is associated with
a drop in the ferroelectric polarization is suddenly quenched upon passing a critical
pressure. These results suggest that above the critical pressure the ferroelectric po-
larization is restored below $T_{C_2}$ and the ferroelectric phase in $RMn_2O_5$ is stabilized
and extends to the lowest temperatures. *also at LBNL, Berkeley and HKUST, Hong Kong

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