

# Low-current-induced electrical hysteresis in $\text{Nd}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$

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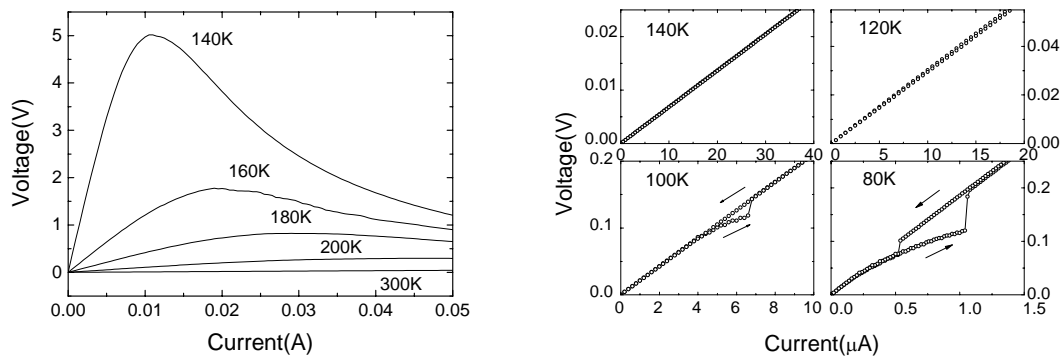
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The electrical characteristics of  $\text{Nd}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$  were investigated by measuring voltage vs. current (V-I) at various temperatures. The V-I curves of the  $\text{Nd}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$  sample change from linear to nonlinear behavior at temperatures below the charge ordering (CO) temperature ( $T_{\text{CO}} \sim 200$  K). An unexpected and reproducible electrical hysteresis loop is observed in the linear region below the Curie temperature ( $T_{\text{C}} \sim 110$  K); it is associated with the “tearing” of a two-domain structure of weak and strong CO-state. The required current for this hysteresis is of the order of  $\mu\text{A}$ , which is appropriate for the low-current memory devices.



**Left:** Voltage-current (V-I) characteristic at various temperatures (300, 200, 180, 160 and 140K) at currents scanned from zero to 0.05A.

**Right:** V-I curves measured at four temperatures 140 (top left), 120 (top right), 100 (bottom left) and 80K (bottom right), in a reduced current regime at low temperatures.