

Supporting Information

1. The variation of the lattice parameters of $\text{La}_{0.7-x}\text{Gd}_x\text{Ca}_{0.3}\text{MnO}_3$

Figure S1 depicts the variation in lattice constant and cell volume observed in $\text{La}_{0.7-x}\text{Gd}_x\text{Ca}_{0.3}\text{MnO}_3$. It can be seen that the introduction of Gd^{3+} , which has a small ionic radius, results in a continuous decrease in cell volume. Although the variation of b and c with Gd content increase is not linear, the tendency is decrease.

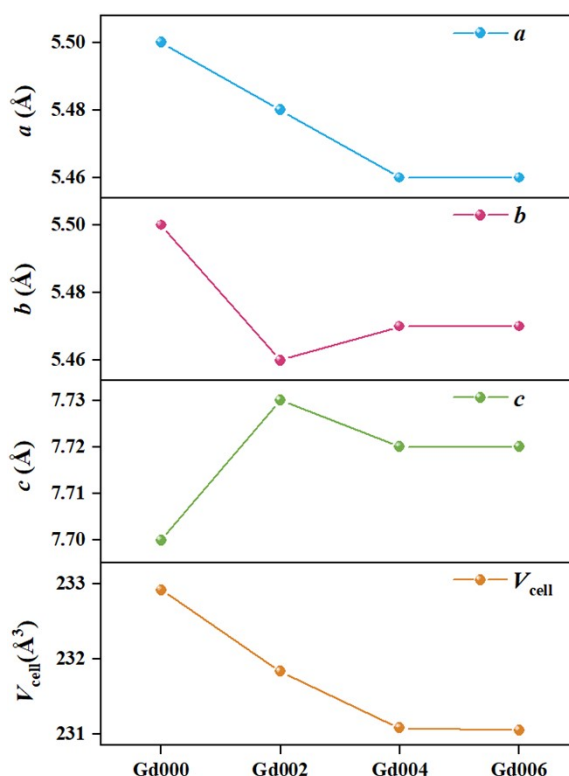


Fig. S1 The lattice parameters plot of $\text{La}_{0.7-x}\text{Gd}_x\text{Ca}_{0.3}\text{MnO}_3$

2. The EDX analysis for Gd000 and Gd004

The Energy Dispersive X-Ray Spectroscopy (EDX) test conducted on Gd000 and Gd004 during HRTEM testing are illustrated in Figure S2. We can see that the actual component is in proximity to the designed component, regardless of whether the sample is doped or not. These results indicate that the presence of trace amounts of Gd^{3+} can induce lattice distortion.

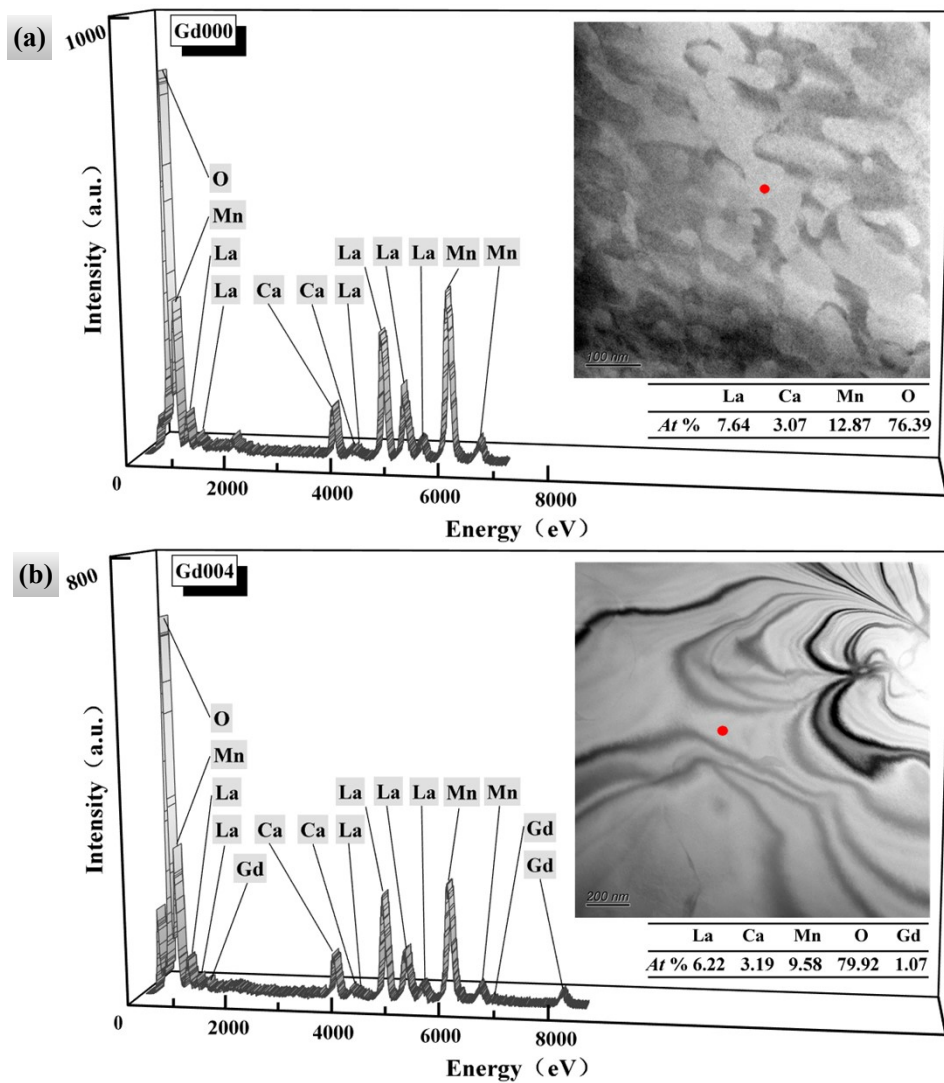


Fig. S2 The result of EDX: (a) Gd000; (b) Gd004