Supplementary Information

Enhancement linear electrical properties and thermal stability of chromite perovskites through entropy engineering

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Table S1. The elemental composition of $LaCrO_{3-\delta}$ and $(5RE_{0.2})CrO_{3-\delta}$.

Sample	Element concentration [at.%] and the ratio of A site element and Cr							Real composition
	La	Nd	Sm	Gd	Y	Cr	A:Cr	
$LaCrO_{3-\delta}$	18.96	-	-	-	-	21.03	0.90:1	$La_{0.90}CrO_{3-\delta}$
$(5RE_{0.2})CrO_{3-\delta}$	4.07	4.40	4.44	3.55	5.32	20.86	1:0.95	$La_{0.19}Nd_{0.20}Sm_{0.20}Gd_{0.16}Y_{0.24}Cr_{0.95}O_{3-\delta}$

Table S2. Impedance spectrum fitting results for $LaCrO_{3-\delta}$ and $(5RE_{0.2})CrO_{3-\delta}$.

Compound	R_1 (Ω)	C_1 (F)	R_2 (Ω)	C_2 (F)
$LaCrO_{3-\delta}$	274	1.690E-9	/	/
$(5RE_{0.2})CrO_{3-\delta}$	3931	7.163E-10	1897	1.133E-8

Figure S1. XRD pattern and refinement results for LaCrO$_{3-\delta}$.

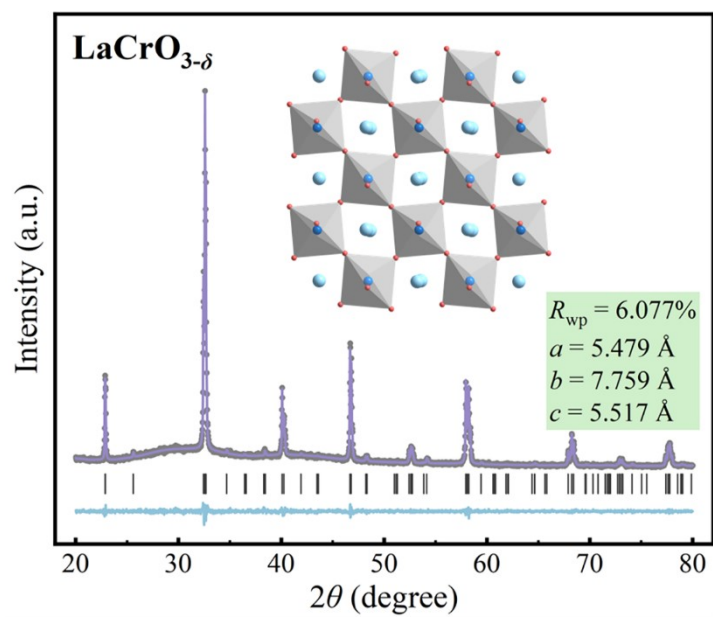**Figure S2.** (a, b) SEM-EDS element mapping, and (c) atomic ratio distribution of $LaCrO_{3-\delta}$ and $(5RE_{0.2})CrO_{3-\delta}$ ceramic.
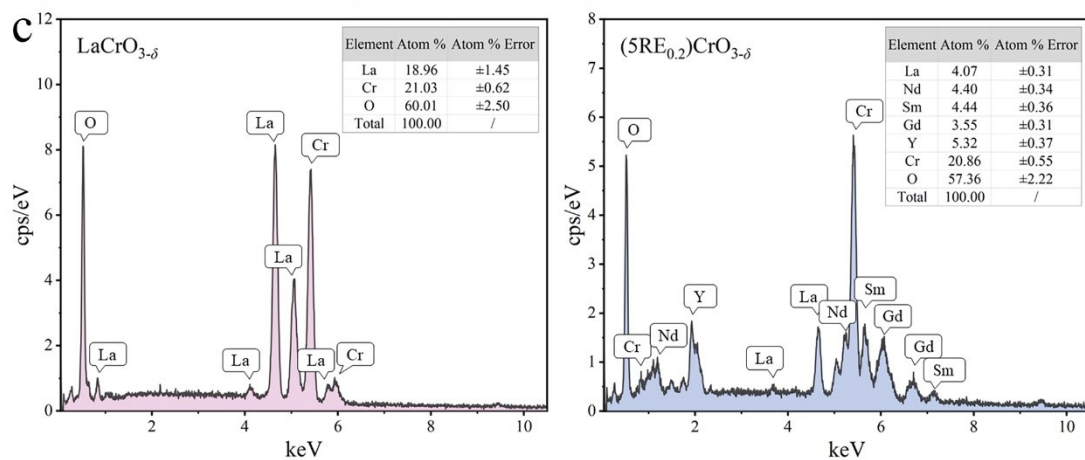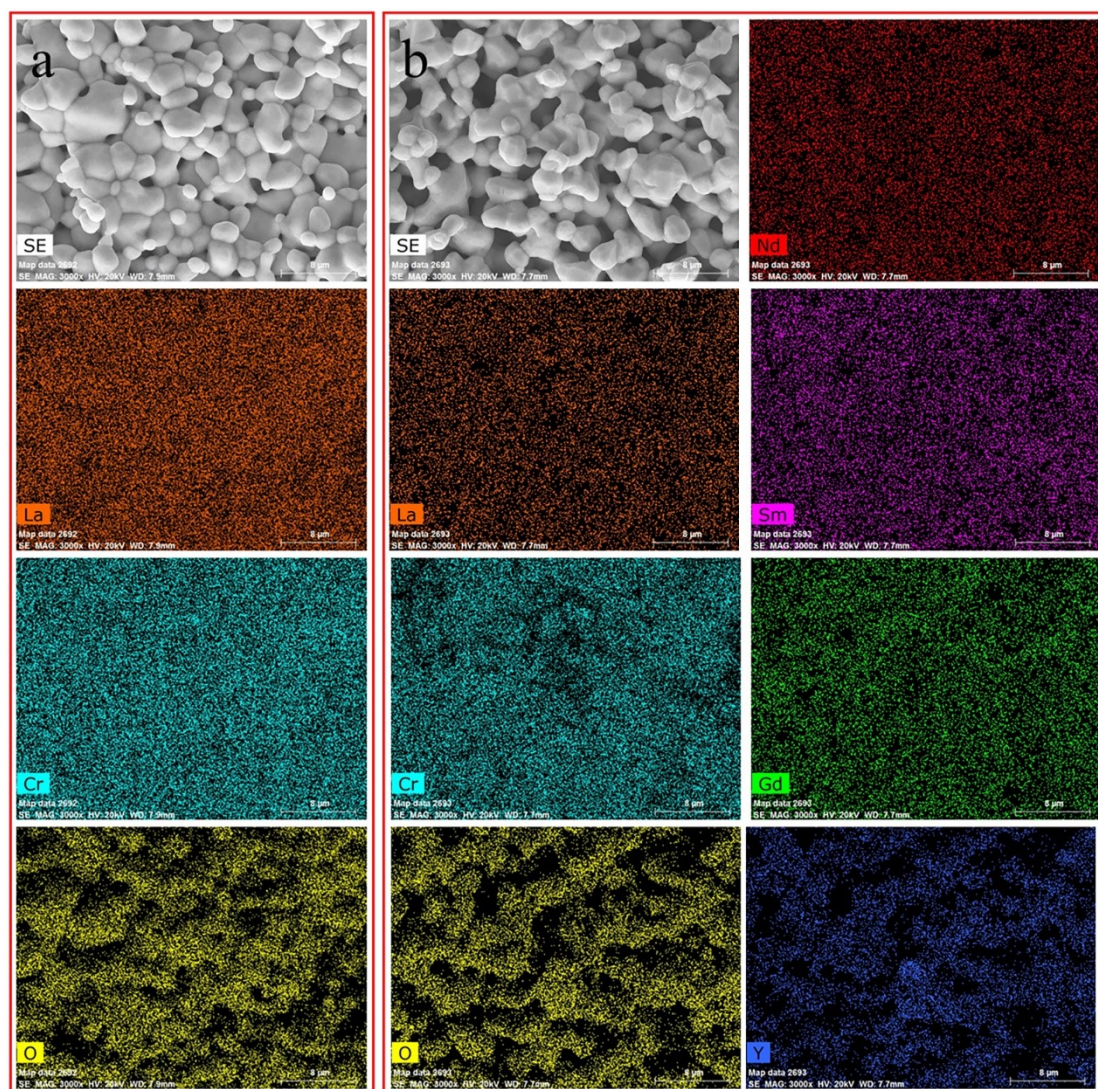
Figure S3. Geometric phase analysis plots and statistics of $(5RE_{0.2})CrO_{3-\delta}$ along the xx and yy directions.