

**Table S11.** Assignment of vibrational modes in FTIR spectra of LnFeO<sub>3</sub> obtained by thermal decomposition of Ln[Fe(CN)<sub>6</sub>].nH<sub>2</sub>O.

Vibrational mode	NdFeO <sub>3</sub> 700°C	SmFeO <sub>3</sub> 750°C	GdFeO <sub>3</sub> 800°C
vFe-O	568 cm <sup>-1</sup>	564 cm <sup>-1</sup>	557 cm <sup>-1</sup>
δFe-O-Fe	414 cm <sup>-1</sup>	418 cm <sup>-1</sup>	426 cm <sup>-1</sup>
vO-H	3443 cm <sup>-1</sup>	3466 cm <sup>-1</sup>	3350 cm <sup>-1</sup>

**Table S12.** Atomic composition determined by EDS of LnFeO<sub>3</sub> obtained by thermal decomposition of Ln[Fe(CN)<sub>6</sub>].nH<sub>2</sub>O at different temperatures

LaFeO <sub>3</sub>			NdFeO <sub>3</sub>			SmFeO <sub>3</sub>			GdFeO <sub>3</sub>		
650°C–3h		470°C–12h	700°C – 3h		600°C–12h	750°C–3h		620°C–12h	800°C–3h		650°C–12h
Element	Atomic%	Atomic%									
O	56.62	74.25	O	77.50	52.36	O	64.71	67.28	O	53.23	67.04
Fe	21.15	12.62	Fe	11.21	23.35	Fe	17.83	16.64	Fe	23.53	16.37
La	22.23	13.14	Nd	11.29	24.29	Sm	17.46	16.08	Gd	23.24	16.60

**Table S13.** Assignment of vibrational modes in FTIR spectra of LaFeO<sub>3</sub> obtained by different methods.

Vibrational mode	Thermal decomposition at 650°C – 3h	Thermal decomposition at 470°C – 12h	Citrate Method	Pechini Method
vFe-O	570 cm <sup>-1</sup>	576 cm <sup>-1</sup>	577 cm <sup>-1</sup>	578 cm <sup>-1</sup>
δFe-O-Fe	406 cm <sup>-1</sup>	411 cm <sup>-1</sup>	407 cm <sup>-1</sup>	408 cm <sup>-1</sup>
vO-H	3589 cm <sup>-1</sup>	3338 cm <sup>-1</sup>	3317 cm <sup>-1</sup>	3408 cm <sup>-1</sup>

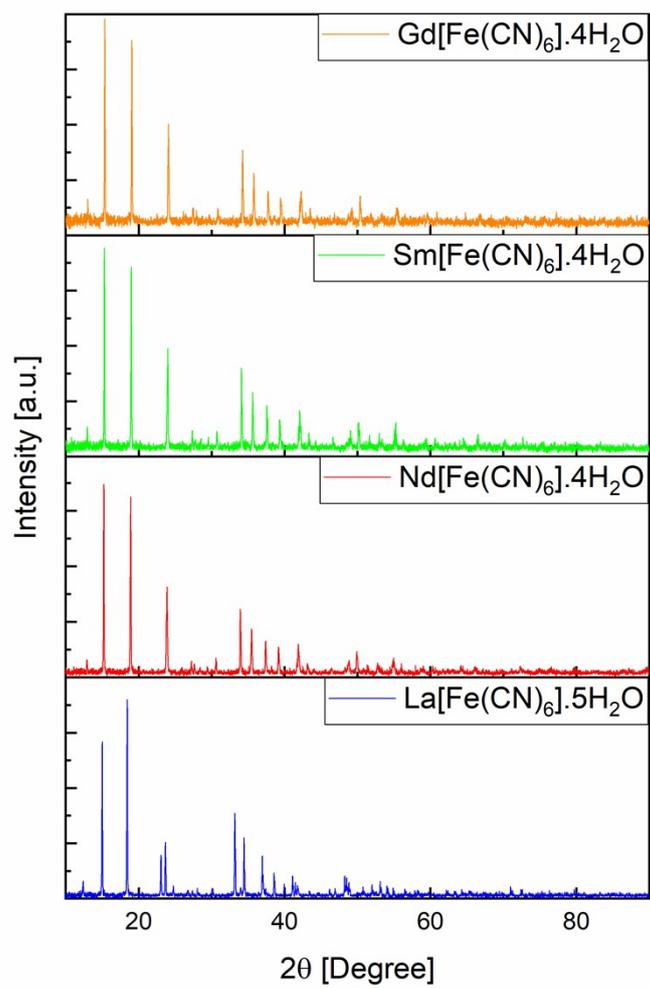
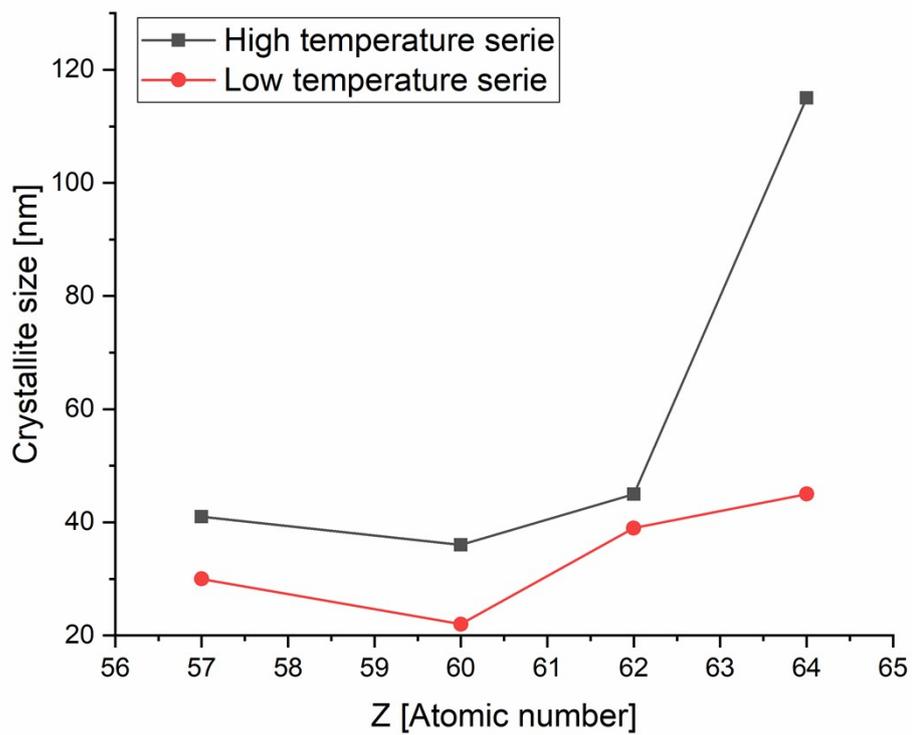


Figure S11. XRPD patterns of complexes  $\text{La}[\text{Fe}(\text{CN})_6] \cdot 5\text{H}_2\text{O}$ ,  $\text{Nd}[\text{Fe}(\text{CN})_6] \cdot 4\text{H}_2\text{O}$ ,  $\text{Sm}[\text{Fe}(\text{CN})_6] \cdot 4\text{H}_2\text{O}$ , and  $\text{Gd}[\text{Fe}(\text{CN})_6] \cdot 4\text{H}_2\text{O}$ .



**Figure S12.** Crystallite size variation as a function of atomic number of  $\text{Ln}^{3+}$  cation of  $\text{LnFeO}_3$  oxides obtained by thermal decomposition at high temperature (gray line) and at low temperature (red line).