

# Transition from AFM Spin Canting to Spin Glass–AFM Exchange as Particle Size Decreases in LaFeO<sub>3</sub>

## S1. Compositional analysis

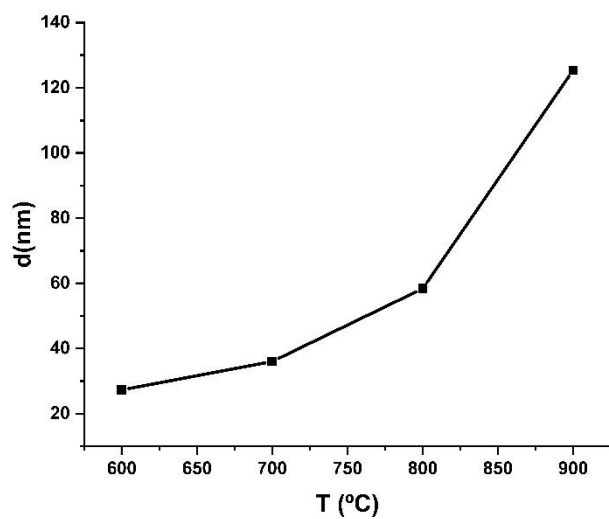
Table S1: XEDS analyses in LF-800 sample.

Fe Atomic (%)	La Atomic (%)	Stoichiometric Composition
42.68	57.32	La <sub>1.15</sub> Fe <sub>0.85</sub> O <sub>3</sub>
45.98	54.02	La <sub>1.08</sub> Fe <sub>0.92</sub> O <sub>3</sub>
45.04	54.96	La <sub>1.10</sub> Fe <sub>0.90</sub> O <sub>3</sub>
44.78	55.22	La <sub>1.10</sub> Fe <sub>0.90</sub> O <sub>3</sub>

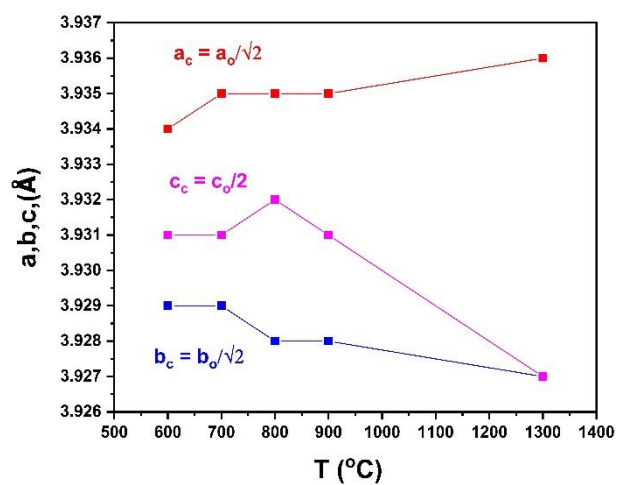
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48.12	51.88	$\text{La}_{1.04}\text{Fe}_{0.96}\text{O}_3$
43.98	56.02	$\text{La}_{1.12}\text{Fe}_{0.88}\text{O}_3$
45.10	54.90	$\text{La}_{1.10}\text{Fe}_{0.90}\text{O}_3$
45.21	54.79	$\text{La}_{1.10}\text{Fe}_{0.90}\text{O}_3$
44.55	55.45	$\text{La}_{1.11}\text{Fe}_{0.89}\text{O}_3$
44.87	55.13	$\text{La}_{1.10}\text{Fe}_{0.90}\text{O}_3$
45.11	54.89	$\text{La}_{1.10}\text{Fe}_{0.90}\text{O}_3$
46.25	53.75	$\text{La}_{1.08}\text{Fe}_{0.92}\text{O}_3$
47.09	52.91	$\text{La}_{1.06}\text{Fe}_{0.94}\text{O}_3$
45.51	54.49	$\text{La}_{1.09}\text{Fe}_{0.91}\text{O}_3$
49.52	50.48	$\text{La}_{1.01}\text{Fe}_{0.99}\text{O}_3$
44.80	55.20	$\text{La}_{1.10}\text{Fe}_{0.90}\text{O}_3$
46.36	53.64	$\text{La}_{1.07}\text{Fe}_{0.93}\text{O}_3$
45.84	54.16	$\text{La}_{1.08}\text{Fe}_{0.92}\text{O}_3$
45.58	54.42	$\text{La}_{1.09}\text{Fe}_{0.91}\text{O}_3$
43.97	56.03	$\text{La}_{1.12}\text{Fe}_{0.88}\text{O}_3$
47.48	52.52	$\text{La}_{1.05}\text{Fe}_{0.95}\text{O}_3$
44.25	55.75	$\text{La}_{1.12}\text{Fe}_{0.88}\text{O}_3$
48.26	51.74	$\text{La}_{1.04}\text{Fe}_{0.96}\text{O}_3$
43.51	56.49	$\text{La}_{1.13}\text{Fe}_{0.87}\text{O}_3$
		<b><math>\text{La}_{1.09}\text{Fe}_{0.91}\text{O}_3</math></b>

## S2. XRD Diffraction

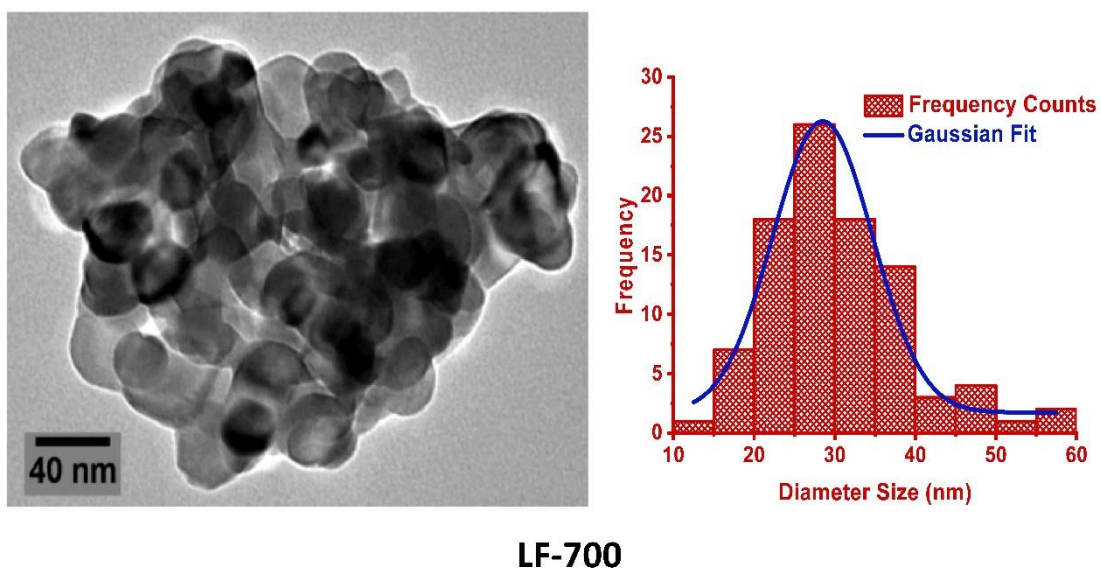


**Figure S1:** Mean crystallite size (nm) calculated by Scherrer's equation for all sol-gel samples LF-600, LF-700, LF-800, and LF-900.



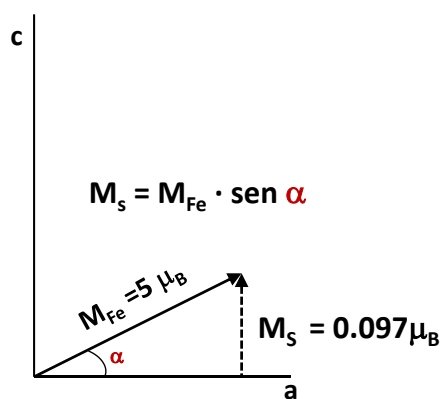
**Figure S2:** The variation values of cell parameters a, b, and c as a function of annealing temperature.

### S3. High resolution microscopy.



**Figure S3:** (Left) LF-700 TEM image. (Right) Distribution of the nanoparticle diameters with Gaussian fit.

#### S4. Magnetic properties



**Figure S4:** Spin canting angle.