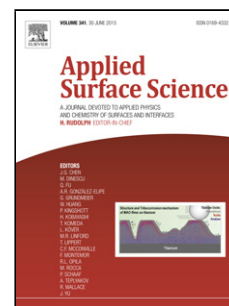


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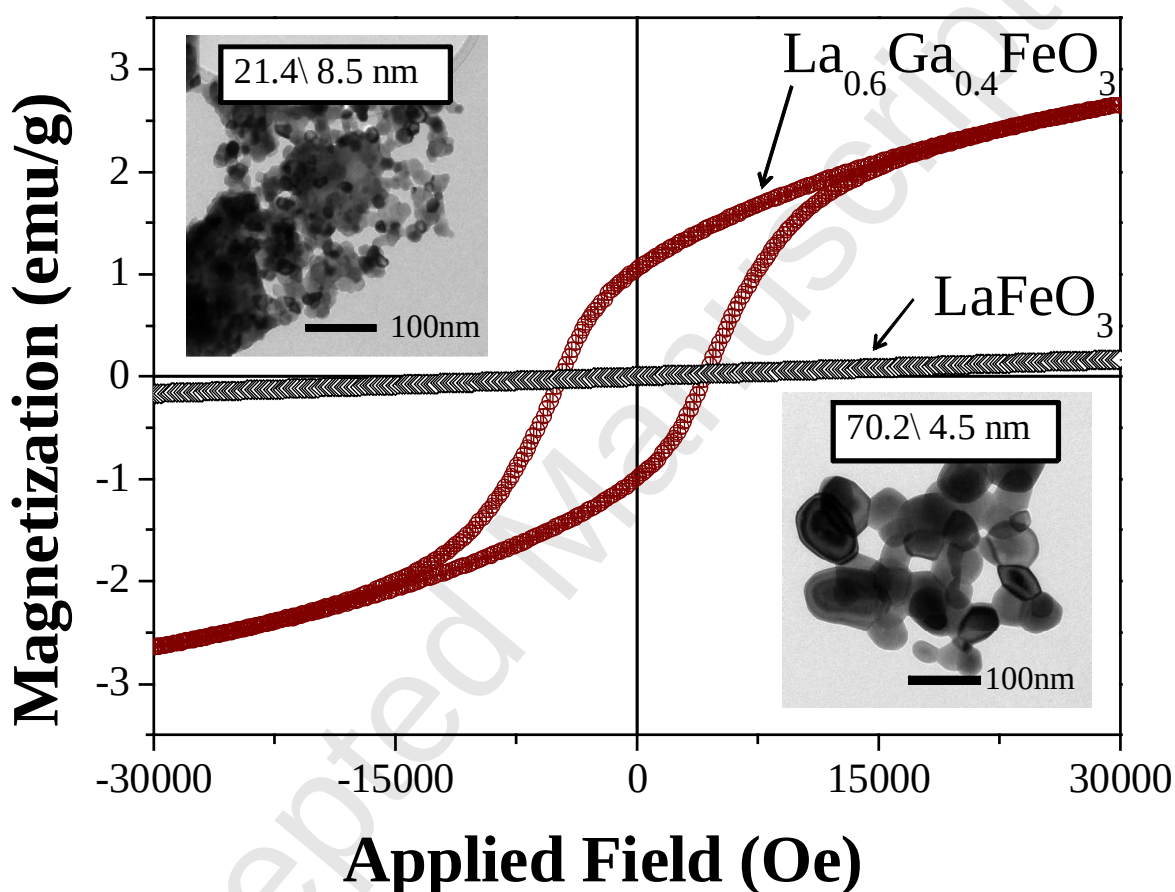
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Graphical abstract



This figure shows the hysteresis loops of LaFeO_3 and $\text{La}_{0.6}\text{Ga}_{0.4}\text{FeO}_3$ nanoparticles with corresponding TEM images. Undoped sample exhibits antiferromagnetic behavior, whereas doped sample becomes ferromagnetic material. Particle sizes estimated by TEM are decreased from 70.2 ± 4.5 to $21.4 \pm 8.5 \text{ nm}$ with increasing Ga content. The decrease of particle size causes the disordering spins at the surface of particle which can induce a net magnetic moment and significantly enhance the magnetization (M), coercive field (H_c) and remanent magnetization (M_r).

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