Electronic Supplementary Information

Single crystalline magnetite, maghemite, and hematite nanoparticles with rich coercivity

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Table S1. Table showing comparison of *d*-spacing values of Fe_3O_4 and γ-Fe_2O_3 nanoparticles

γ-Fe_2O_3 (JCPDS no = 39-1346)	Magnetite- (JCPDS no=19-0629)	γ-Fe_2O_3	Magnetite
30.241	30.095	30.299	30.077
35.631	35.423	35.657	35.401
43.285	43.053	43.368	43.009
62.927	62.516	62.974	62.522

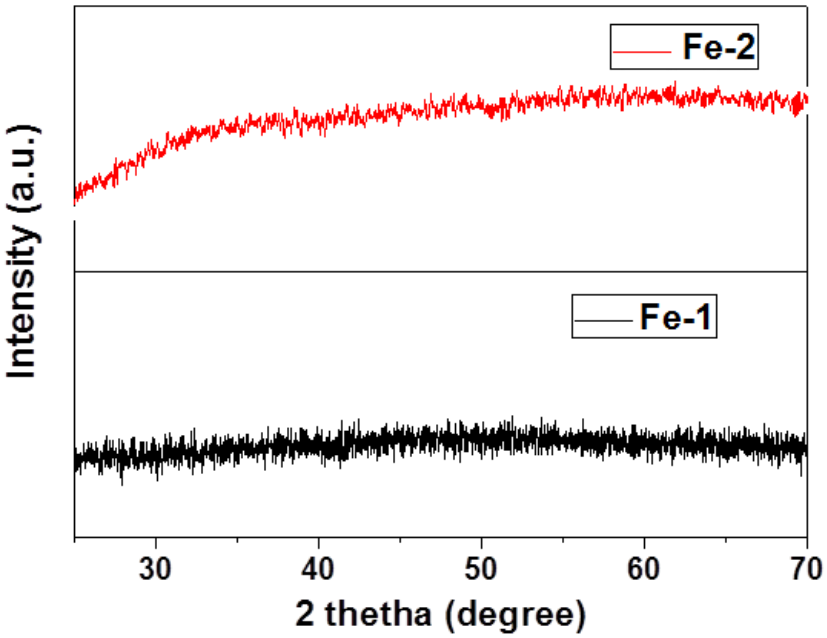

Fig. S1 X-ray powder diffraction patterns for Fe-1 and Fe-2 nanoparticles

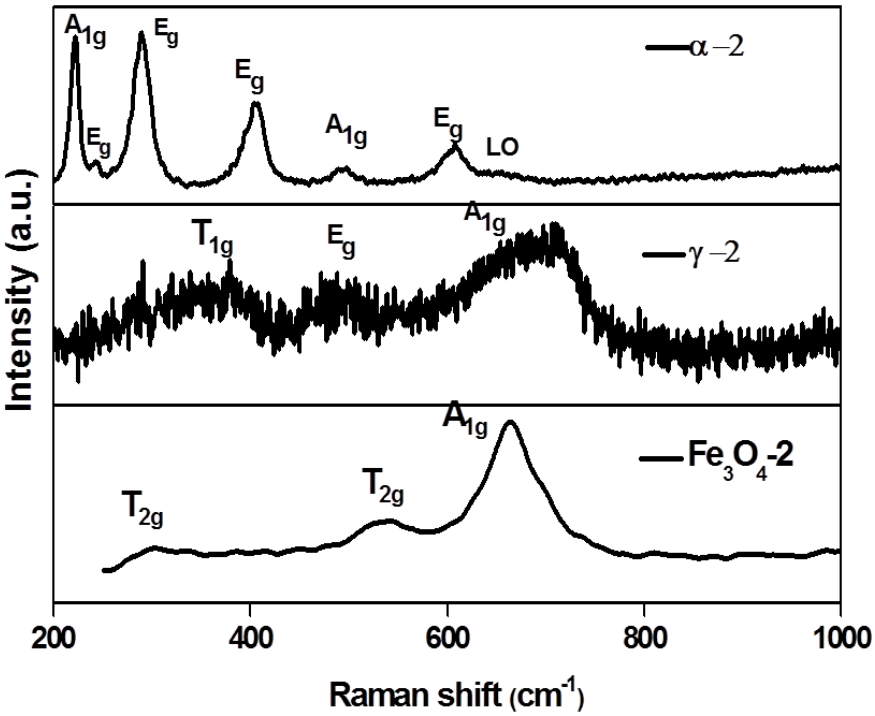

Fig. S2 Raman spectra of Fe_3O_4-2, γ-2 and α-2 nanoparticles.

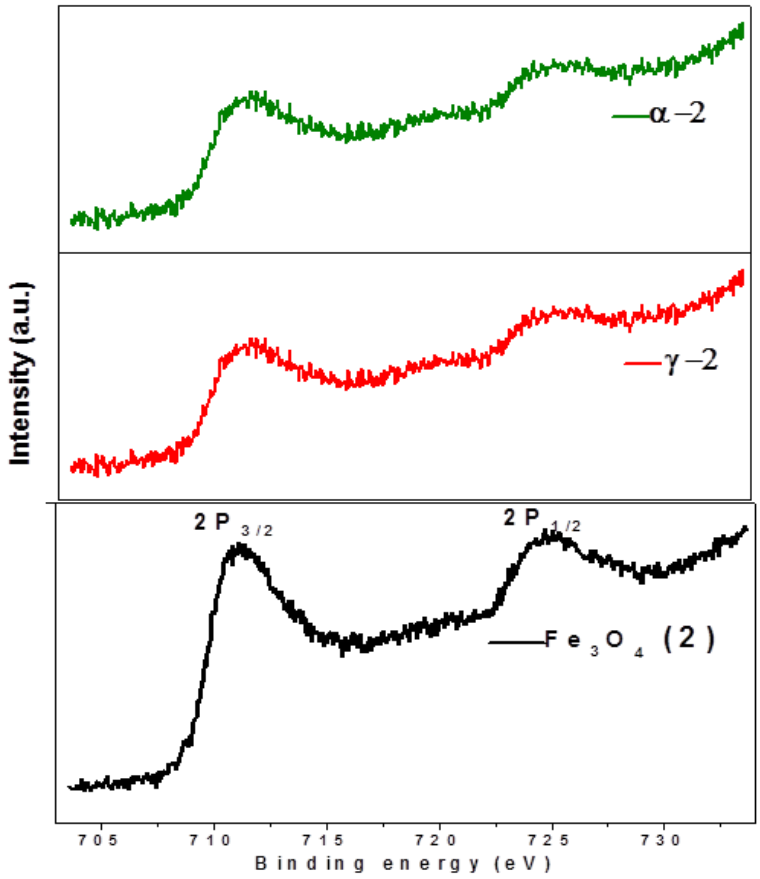

Fig. S3 Core shell Fe2p XPS data for Fe_3O_4-2, γ-2 and α-2 nanoparticles.

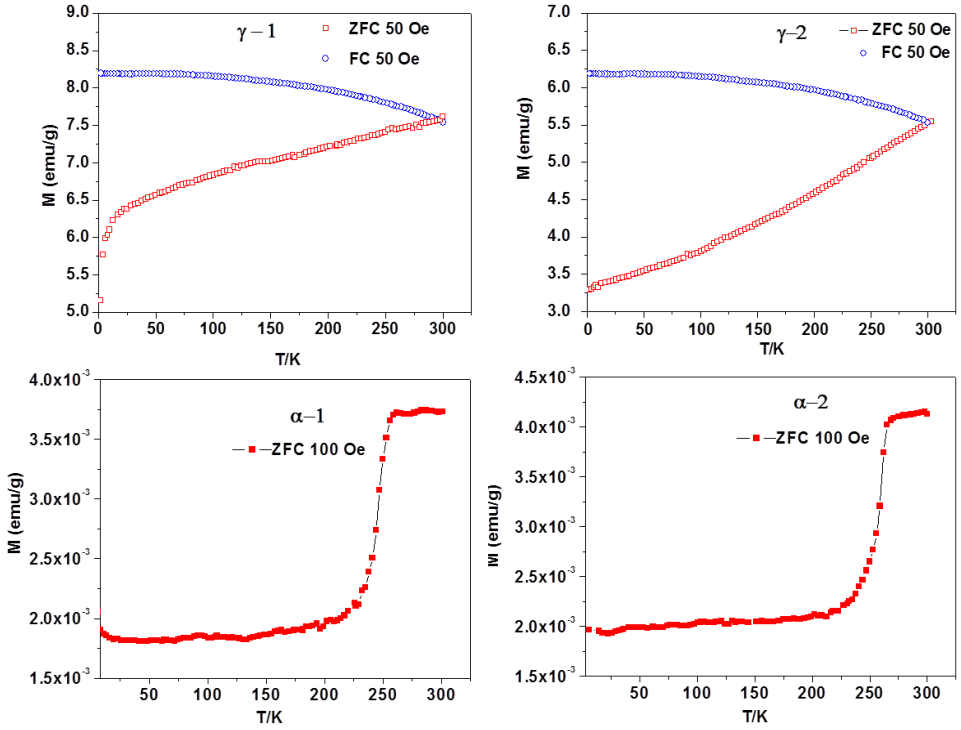

Fig. S4 Temperature-dependent magnetization in γ-Fe_2O_3 and α-Fe_2O_3 nanoparticles.

Stoner-Wohlfarth equation:

The Coercivity (H_C) is given by

$$H_C = \frac{2K}{M_S}\left[1 - \left(\frac{25kT}{KV}\right)^{1/2}\right]$$

where H_C is the coercivity, K is the anisotropic constant, M_S is the saturation magnetization, *k* is the Boltzmann constant, V is the volume of the particle and T is the absolute temperature.

Table S2: Summary of magnetic data for different samples derived from hysteresis loops obtained at 300 K and the corresponding calculated H_C values at 300 K.

Sample code	**Nanocrystal size (TEM)**	**M_S (emu/g)**	**H_C (Oe)**	**H_C (Oe) (calculated)**
Fe_3O_4 - 1	30	72	818	1530
Fe_3O_4 - 2	37	71	927	1770
γ-1	35	70	813	1492
γ-2	39	69	910	1687
α-1	60	0.9	3531	5771
α-2	65	0.5	3590	5942