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H_2O-Steered Size/Phase Evolution and Magnetic Property of Large-Scale, Monodisperse Fe_xO_y Nanomaterials

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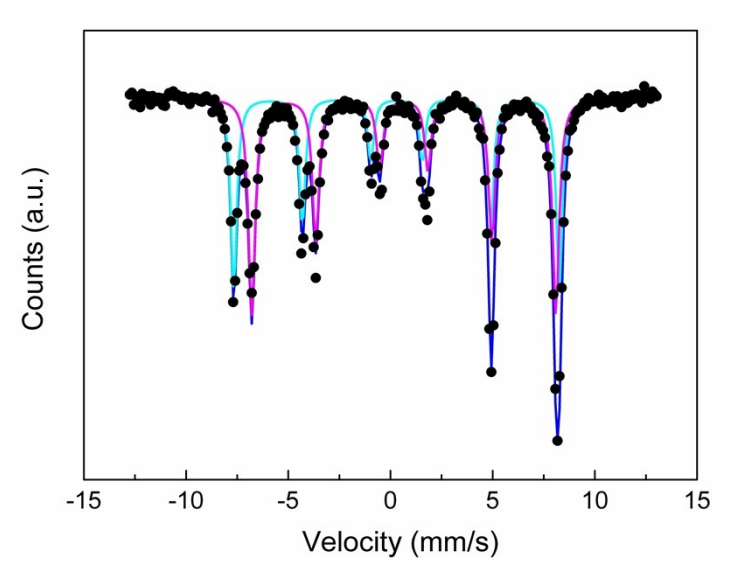

Fig. S1 The Mössbauer spectra of the sample formed at γ= 0 %.

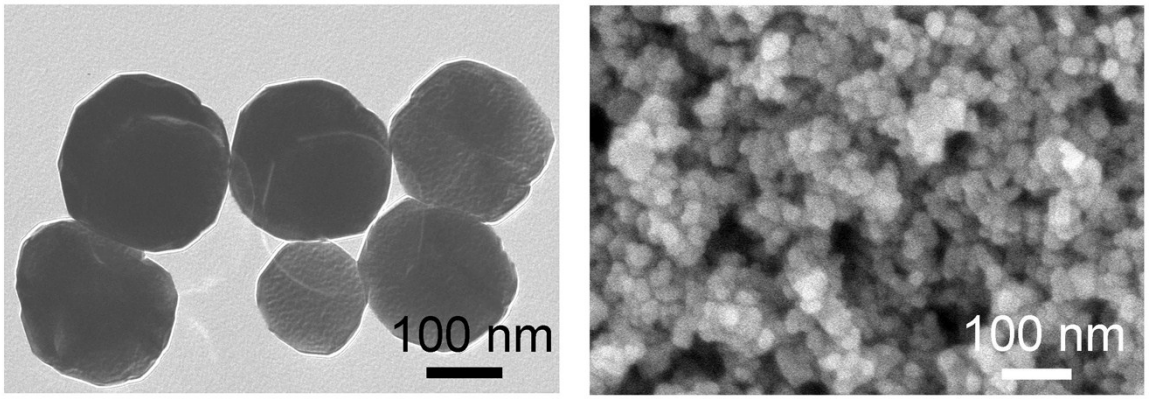

Fig. S2 (a) TEM and (b) SEM images of the products obtained at 200 ºC with various γ: (a) γ= 0 % and (b) γ= 12.5 %.

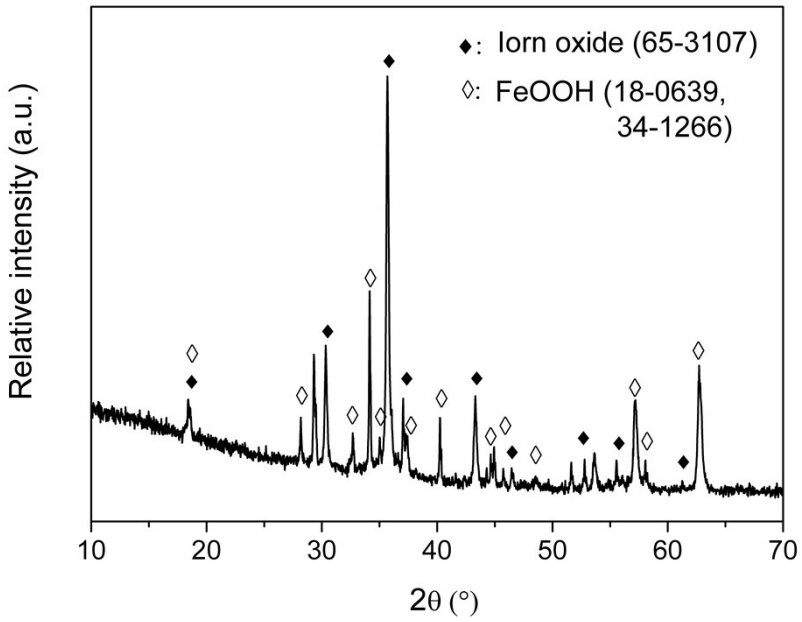

Fig. S3 XRD pattern of the products obtained at 8 h.

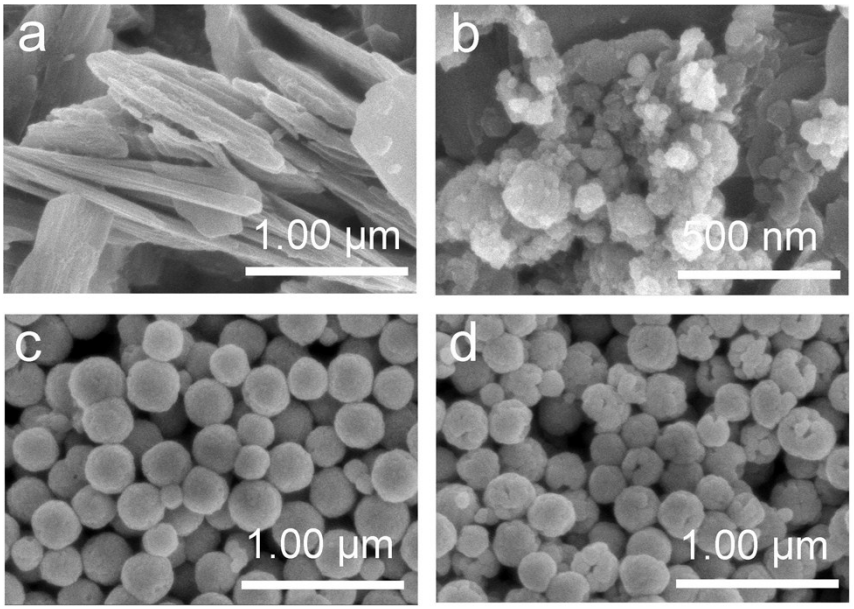

Fig. S4 SEM images of the products obtained at γ = 0% and 200 ºC for various reaction time: (a) 1 h, (b) 2 h, (c) 4 h, and (d) 24 h.

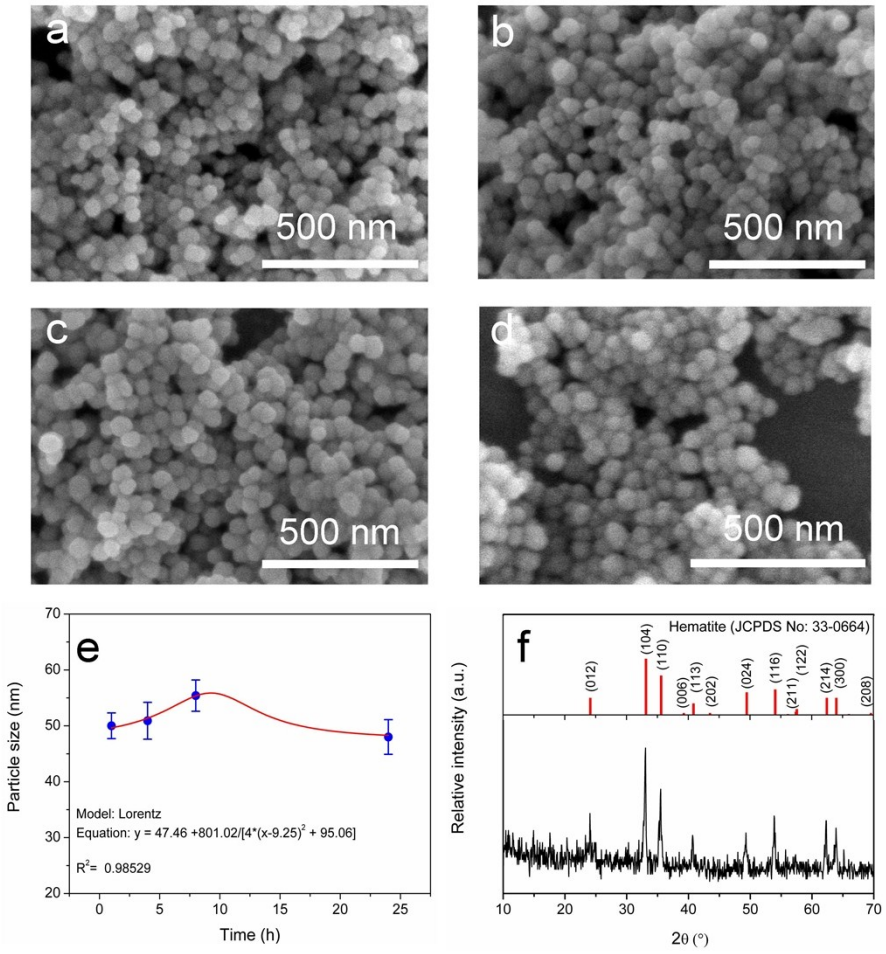

Fig. S5 SEM images of the samples obtained at γ = 100% and 200 ºC for various reaction time: (a) 1 h, (b) 4 h, (c) 8 h, and (d) 24 h. (e) Particle size distribution as a function of reaction time. (f) XRD pattern of the samples obtained at 1 h.

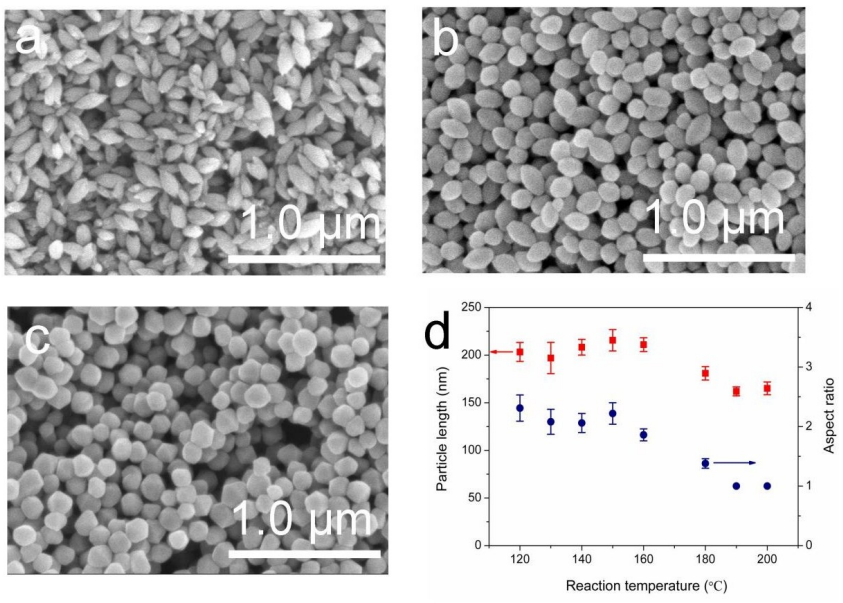

Fig. S6 SEM images of samples obtained at various temperatures: (a) 120 °C, (b) 180 °C, and (c) 190 °C. (d) Particle size distribution as a function of temperature.

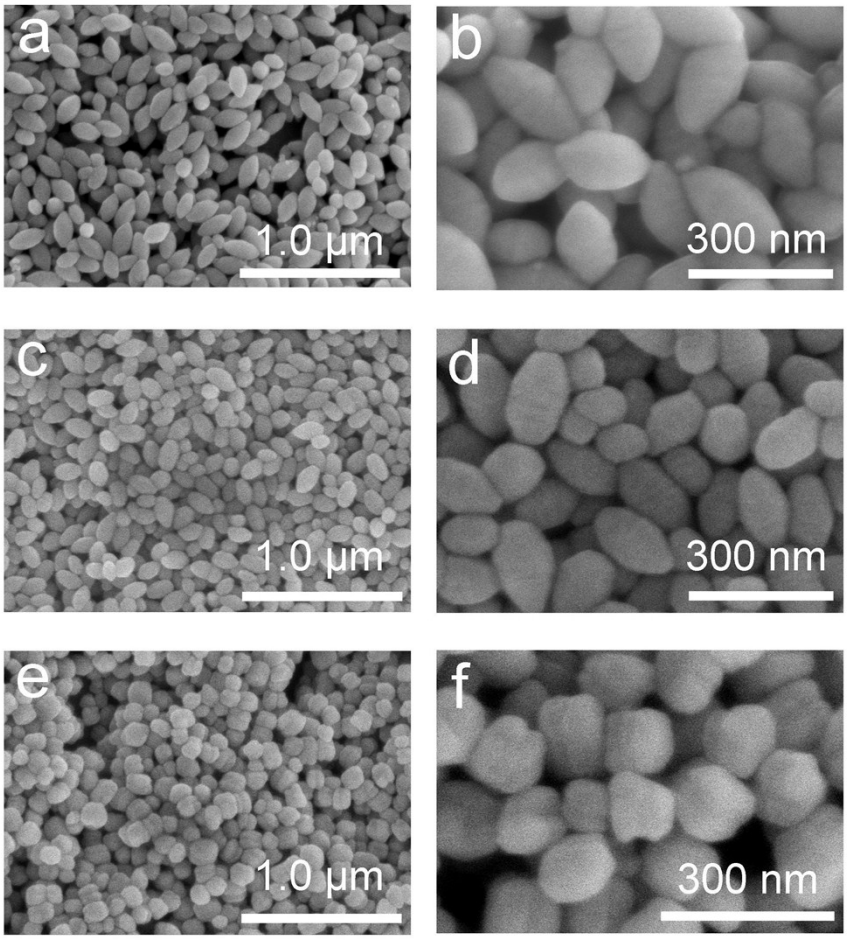

Fig. S7 SEM images of the samples obtained at 160 °C and various Fe^{3+} concentrations: (a and b) 0.03125 M, (c and d) 0.0625 M, and (e and f) 0.21875 M.

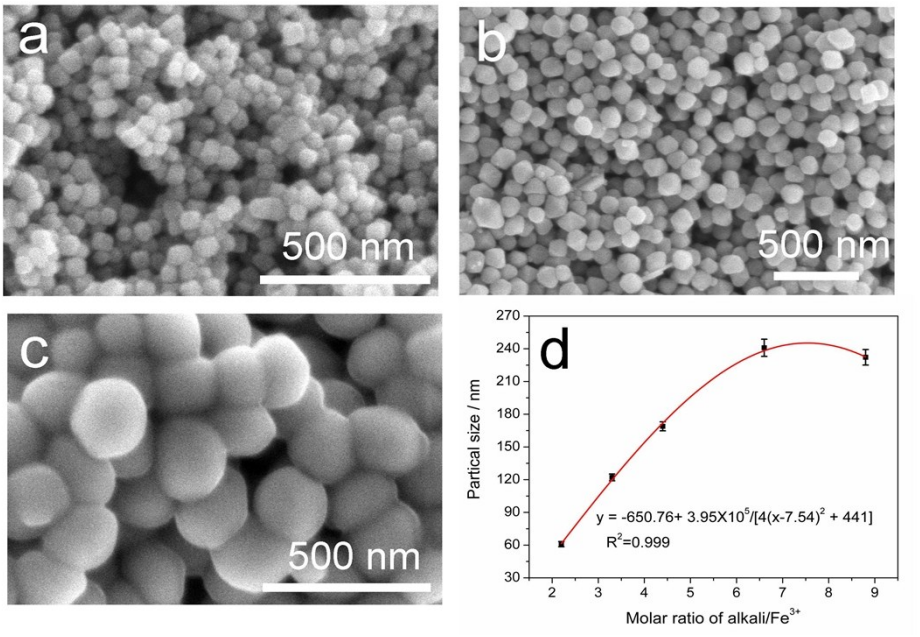

Fig. S8 SEM images of samples obtained at various ratios of alkali/Fe^{3+} (200 °C): (a) 2.2, (b) 3.3, and (c) 6.6. (d) Particle size distribution as a function of alkali/Fe^{3+} ratios.

Table S1 Saturation magnetization (M_s), remanent magnetization (M_r) and coercivity (H_c) of Fe_3O_4 nanoparticles.

Sample	M_s /emu·g^{-1}	M_r /emu·g^{-1}	H_c /Oe	Size	Ref.
Fe_3O_4 nanoparticles	84	/	/	12.7 nm	1
Fe_3O_4 nanoparticles	60	/	0.23	15.5 nm	2
Fe_3O_4 nanoparticles	77.2	4.0	27.7	~20 nm	3
Fe_3O_4 colloidal nanocrystal clusters	63.5	/	/	174 nm	4
Bulk Fe_3O_4	~92	/	/	/	5
Fe_3O_4 cubes	89	2	27	350 – 400 nm	6
Fe_3O_4 nanocubes	60.3	/	/	12 nm	7
Fe_3O_4 nanoflowers	82.6	/	10.5	100 nm	8
Fe_3O_4 nanowires	68.7	/	/	35–100 nm in diameter 0.48–2.7 μm in length	9
Fe_3O_4 octahedral particles	90	/	/	About 4 μm	10
Fe_3O_4 octahedral particles	46	4.2	74	100 nm –several micrometers	11
Fe_3O_4 aggregated spheres	42.8	7.0	44	5 nm (for nanocrystals) 100 nm (for spheres)	12
Fe_3O_4 octahedral particles	86.412	1.915	152.2	155.1 nm	This work
Mixture of α-Fe_2O_3 and Fe_3O_4	0.0371	0.00166	1575.28	204 nm for α-Fe_2O_3 1854.83 nm for Fe_3O_4	This work

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