Supporting Information for

A simple, scalable protocol for the synthesis of ricinoleic acid-functionalised, size- and shape-tunable, hydrophobic and hydrophilic superparamagnetic nanoparticles

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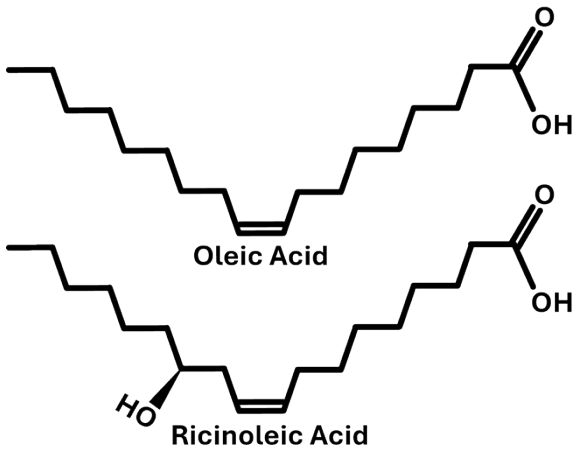

Fig. S1 Structures of oleic acid and ricinoleic acid.

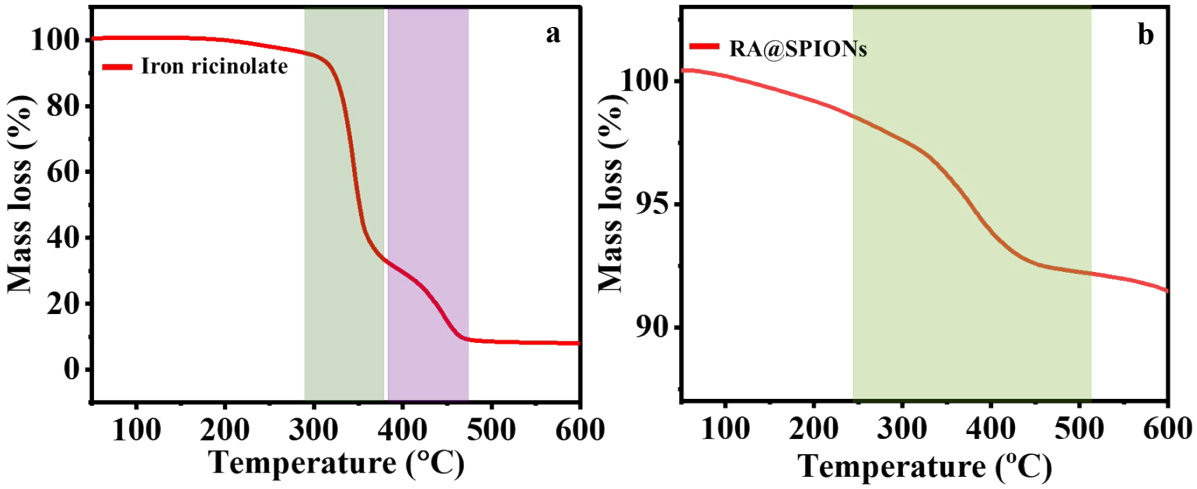

Fig. S2 TGA plot of (a) precursor iron ricinolate and (b) RA@SPIONs.

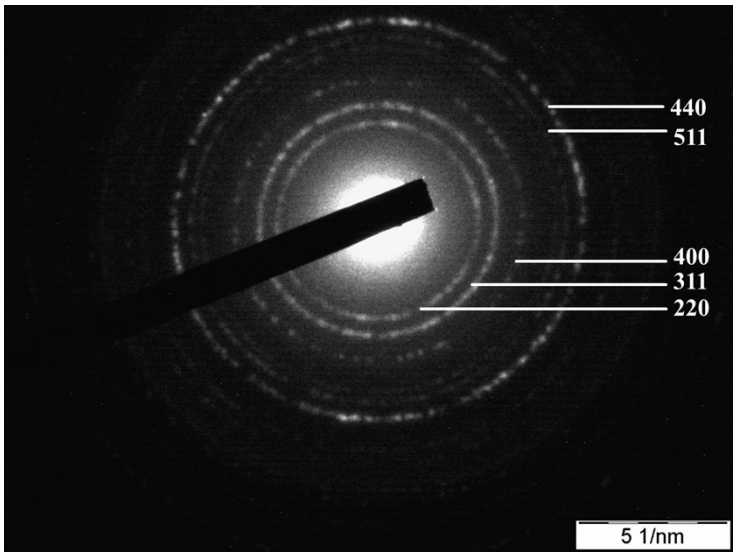

Fig. S3 indexed SAED of the RA@SPIONs.

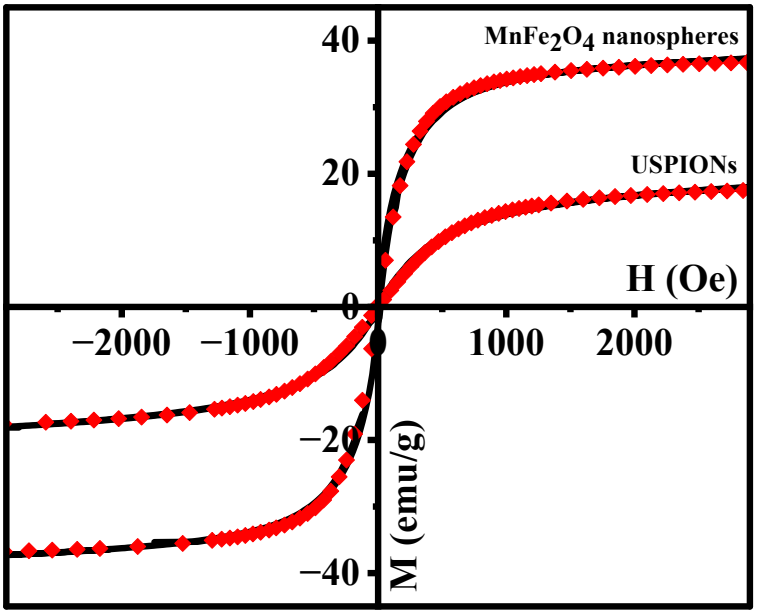

Fig. S4 The isothermal (300K) magnetization (*M*) as a function of the applied magnetic field (*H*) for the ricinoleic acid-coated ultrasmall iron oxide (USPIONs) and manganese ferrite nanoparticles ($MnFe_2O_4$ nanospheres) shown in black solid line. Red triangles represent modified Langevin fit.

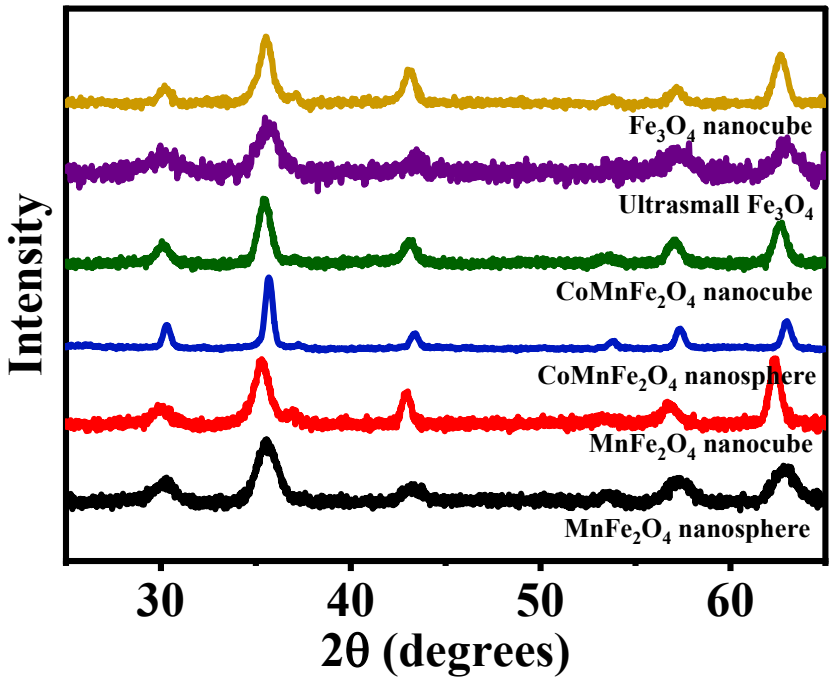

Fig. S5 PXRD pattern of the ultrasmall and cubic iron oxide nanoparticles, $MnFe_2O_4$ and $CoMnFe_2O_4$ nanospheres and cubes.

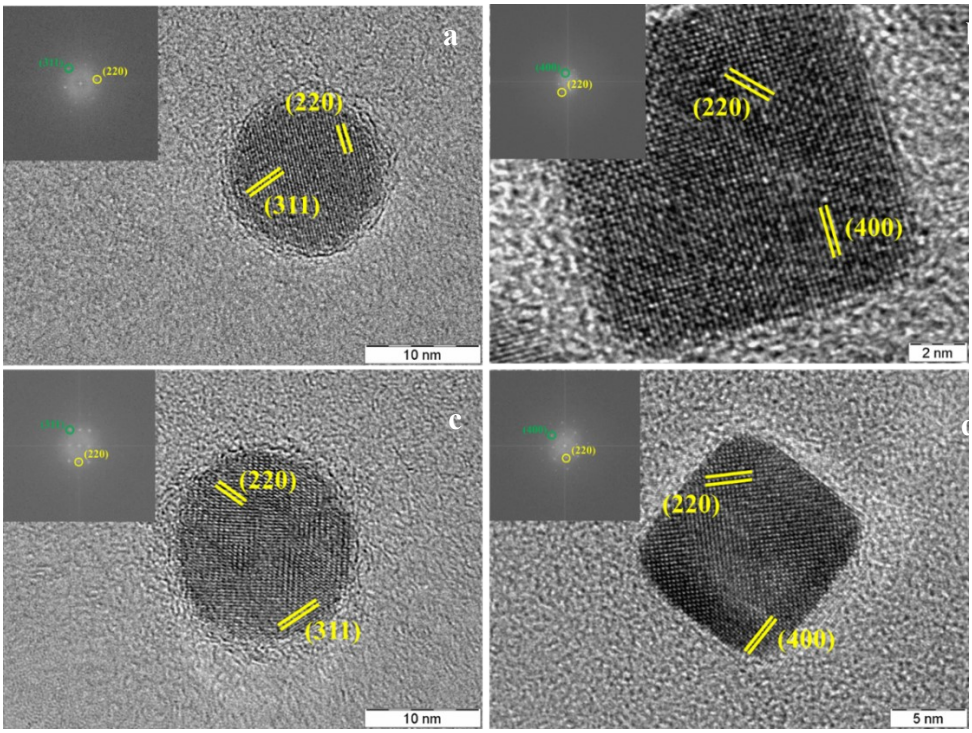

Fig. S6 Indexed HRTEM and corresponding FFT of the $MnFe_2O_4$ (a) nanosphere, (b) nanocube and $CoMnFe_2O_4$ (c) nanosphere and (d) nanocube.

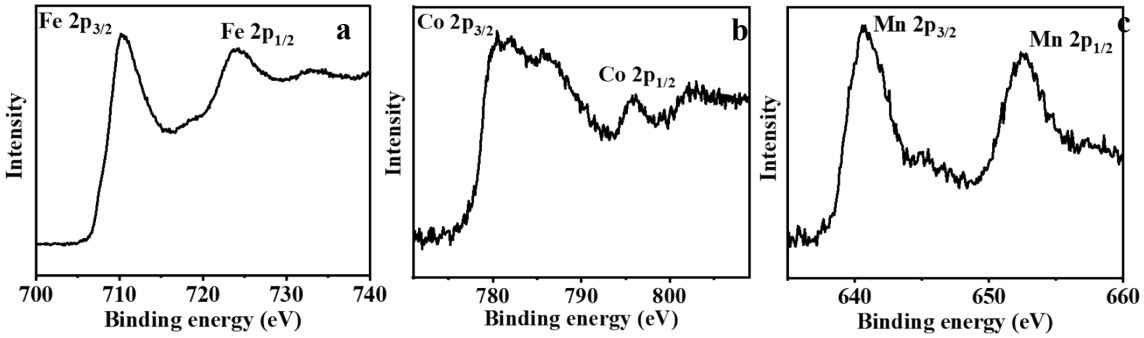

Fig. S7 High-resolution XPS spectra of (a) Fe 2p, (b) Co 2p and (c) Mn 2p of $CoMnFe_2O_4$.

Species	Binding energy (eV)	Assignment
Mn 2p	640.1	Mn $2p_{3/2}$
	652.9	Mn $2p_{1/2}$
Fe 2p	710.7	Fe $2p_{3/2}$
	724.6	Fe $2p_{1/2}$
	718.2, 733.9	Satellite
Co 2p	780.5	Co $2p_{3/2}$
	795.3	Co $2p_{1/2}$
	786.5, 802.3	Satellite

Table S1 XPS binding energies of (a) Mn 2p, (b) Fe 2p and (c) Co 2p of $CoMnFe_2O_4$.

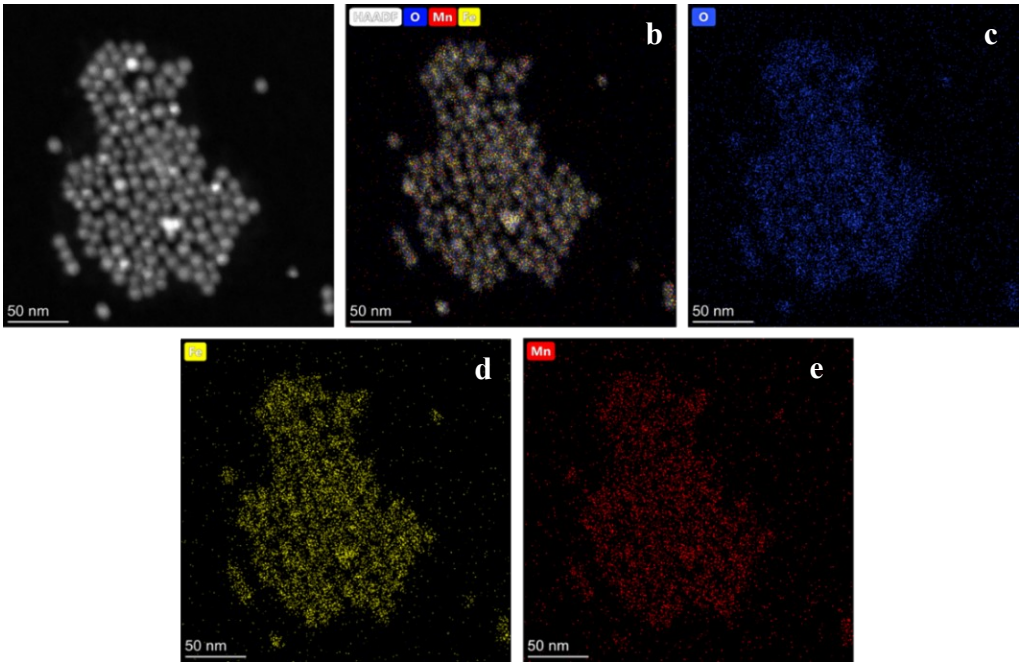

Fig. S8 EDS color mapping of the $MnFe_2O_4$ nanoparticles. (a) HAADF, (b) overlapped, (c) O, (d) Fe, and (e) Mn.

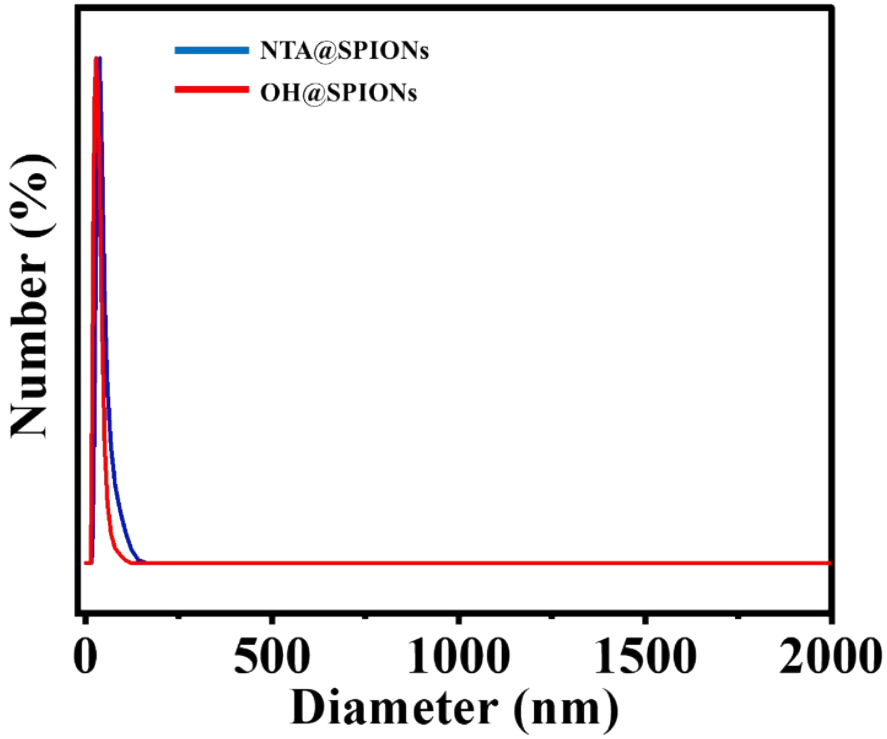

Fig. S9 Hydrodynamic diameter of the NTA@SPIONs and OH@SPIONs.