Supplementary Material (ESI) for *Nanoscale*

Electronic Supplementary Information

Organic Phase Synthesis of Monodisperse Iron Oxide Nanocrystals Using Iron Chloride as Precursor

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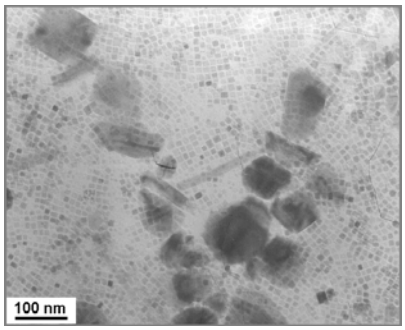

Figure S1. The reaction also produced 60-100 nm particles in a small amount, which were readily removed by centrifuging a hexane solution of NCs at 3000 rpm.

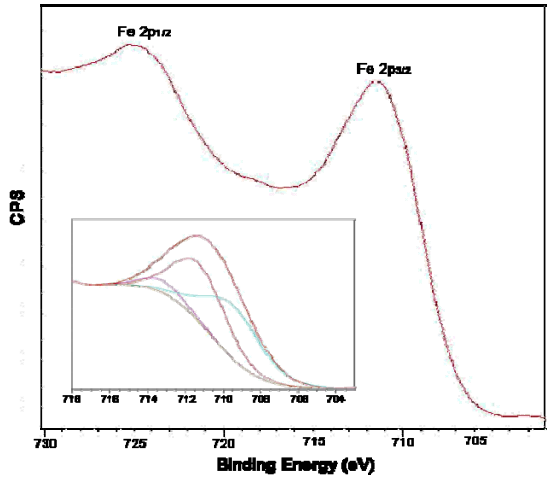

Figure S2. The XPS spectrum of iron oxide nanocrystals at the energy range of Fe 2p. The multiplets of Fe $2p_{3/2}$ (the inset) show the characteristic peaks of Fe^{2+} at 709.4 eV and Fe^{3+} at 711.3 eV from magnetite as well as the characteristic peaks of Fe^{3+} at 713.3 eV from maghemite.

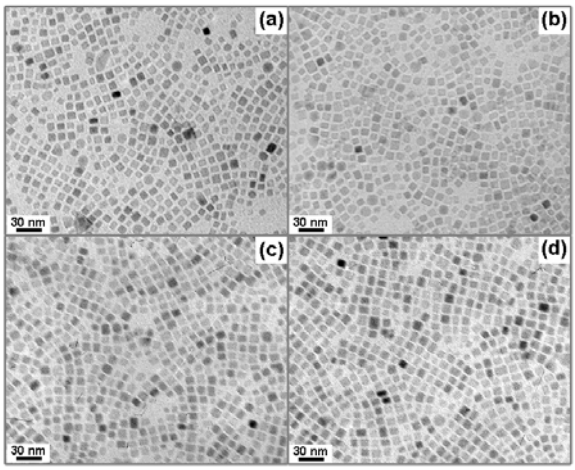

Figure S3. The TEM images of cubic iron oxide NCs synthesized at different heating rates: (a) 1.5, (b) 10, (c) 20, and (d) 30 K/min. The morphologies of iron oxide NCs were similar and no remarkable difference in size or shape was observed.

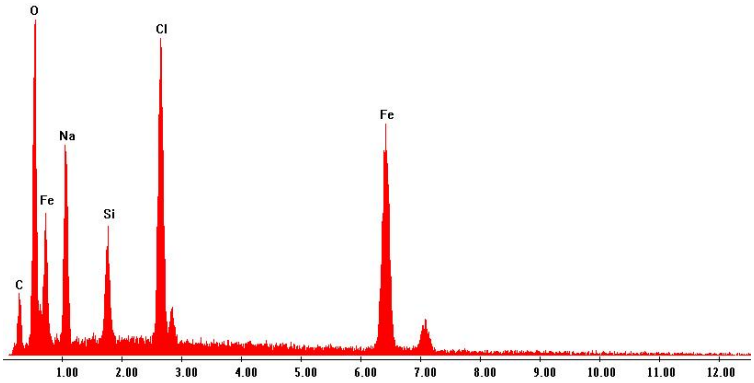

Figure S4. The energy dispersive X-ray (EDX) spectrum of iron oxide NCs without water washing. NaCl was produced through the reaction between $FeCl_3$ and Na-oleate at the thermal condition.

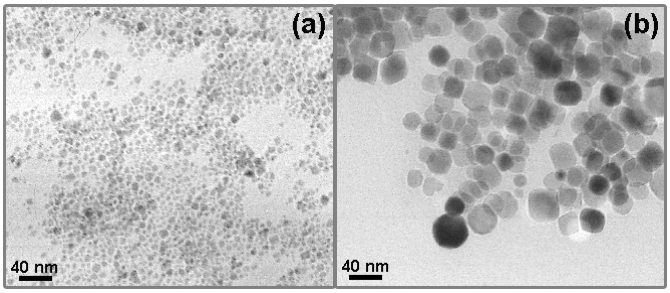

Figure S5. The TEM images of (a) NCs synthesized using $Fe(acac)_2$ in the absence of Cl^- and (b) NCs synthesized using oleylamine and oleic acid in the absence of Na^+.

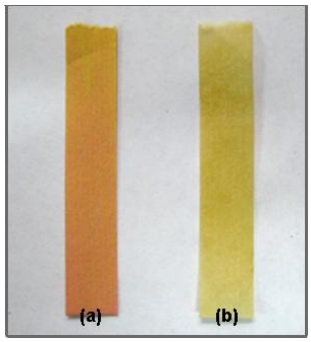

Figure S6. The pH value of the emission gas was below 7 when surfactants (oleic acid and oleylamine) were used in the reaction (a), while the pH value was close to 7 when Na-oleate was used.

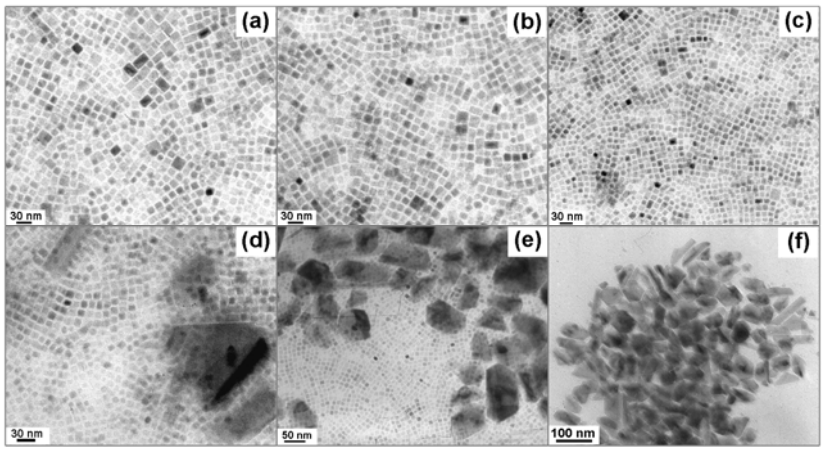

Figure S7. The TEM images of iron oxide NCs synthesized using 0.1, 0.5, 1, 1.5, 2, and 3 mmol NaCl as additive.

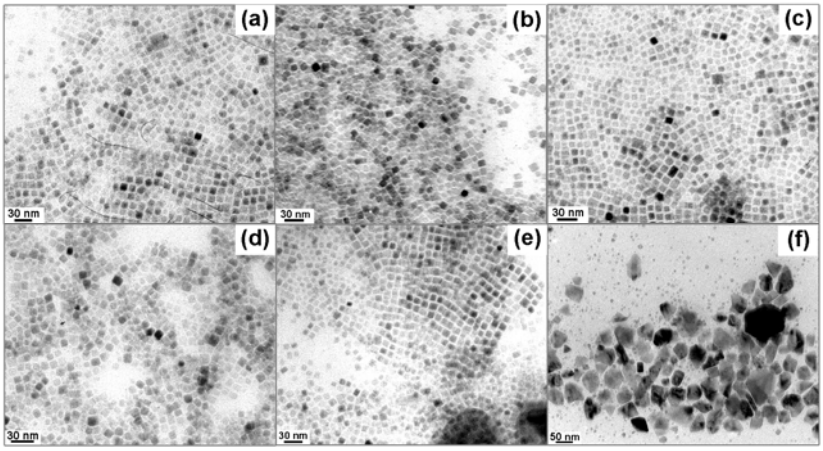

Figure S8. The TEM images of iron oxide NCs synthesized using 0.1, 0.5, 1, 1.5, 2, and 3 mmol NaBr as additive.

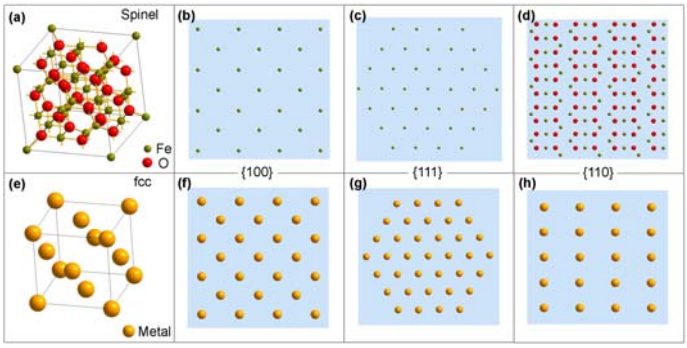

Figure S9. The crystal structures and low-index facets configurations of spinel iron oxide and fcc noble metals. The {100} and {111} surfaces of the spinel (including the inverse spinel) are only iron (III) cations packed and they exhibit similar configurations with the {100} and {111} of fcc.

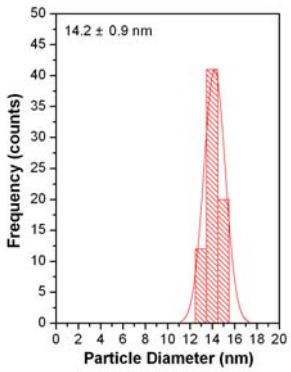

Figure S10. The size distribution histogram of spherical iron oxide NCs.

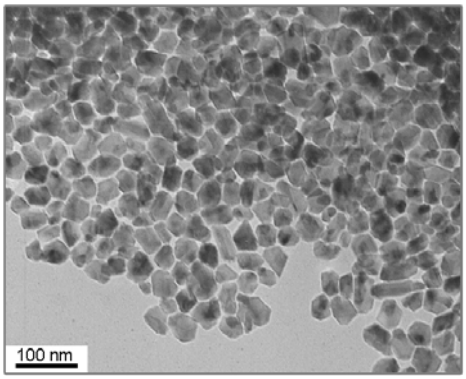

Figure S11. The TEM image of NCs synthesized as the ratio of feeding Co/Fe increased to 1.