Elucidating the morphological and structural evolution of iron oxide nanoparticles formed by sodium carbonate in aqueous medium

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Supporting information

Changes on crystal structure over time were studied by the ATR-FTIR spectra. The as-synthesized sample presented the characteristic goethite $\nu_{OH}$ stretch, $\delta_{OH}$ in plane bend and $\gamma_{OH}$ out of plane bend bands, at 3140, 892 and 795 cm$^{-1}$, which were not present 24 h after the synthesis had been carried out (Figure S1) due to the evolution of the crystal structure over time. As the band observed around 3500 cm$^{-1}$ for magnetite is also associated to coordinated OH groups from the physisorbed water on the nanoparticle surface$^{2, 3}$, it cannot be used for identification purposes.

![Figure S1. ATR-FTIR spectra of iron oxide nanoparticles prepared at RT at $t = 0$ and $t = 24$ h. The 2000 - 2800 cm$^{-1}$ range has been excluded as no significant information was found.](image-url)
Changes in the crystal structure of magnetite nanoparticles studied at pH 10 (Figure S2).

**Figure S2.** XRD pattern shift over 24 h for iron oxide nanoparticles synthesized at RT and pH 10. Diffraction patterns have been offset along the y axis for a better comparison.

**References**

