

## Supplementary Material

# Synthesis, Characterization, and Nanocatalysis Application of Core-Shell Superparamagnetic Nanoparticles of Fe<sub>3</sub>O<sub>4</sub>@Pd

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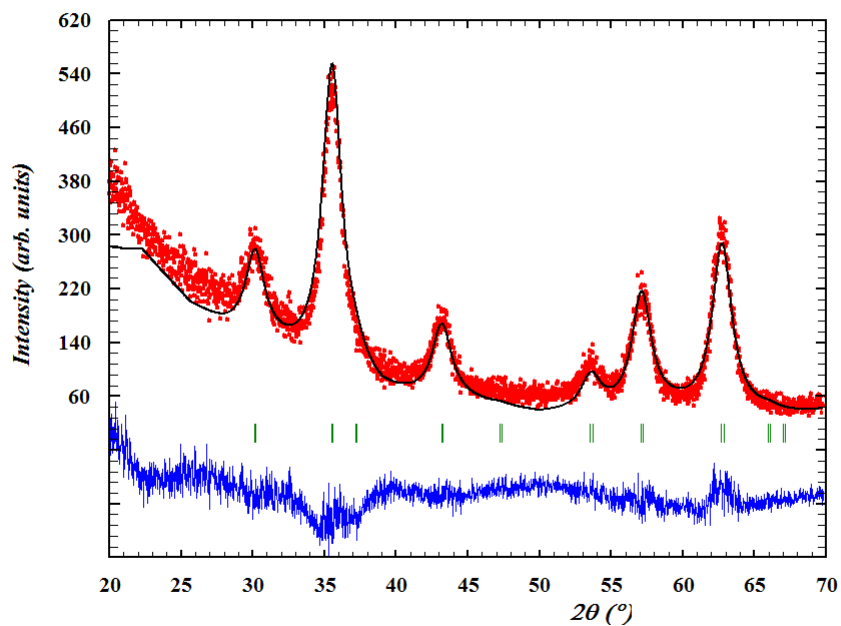
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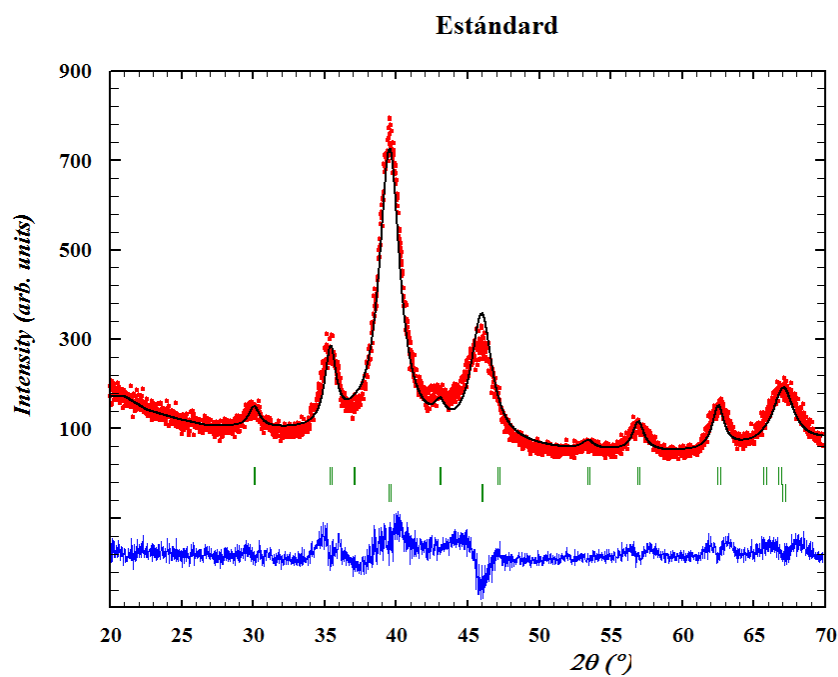
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### Estándar



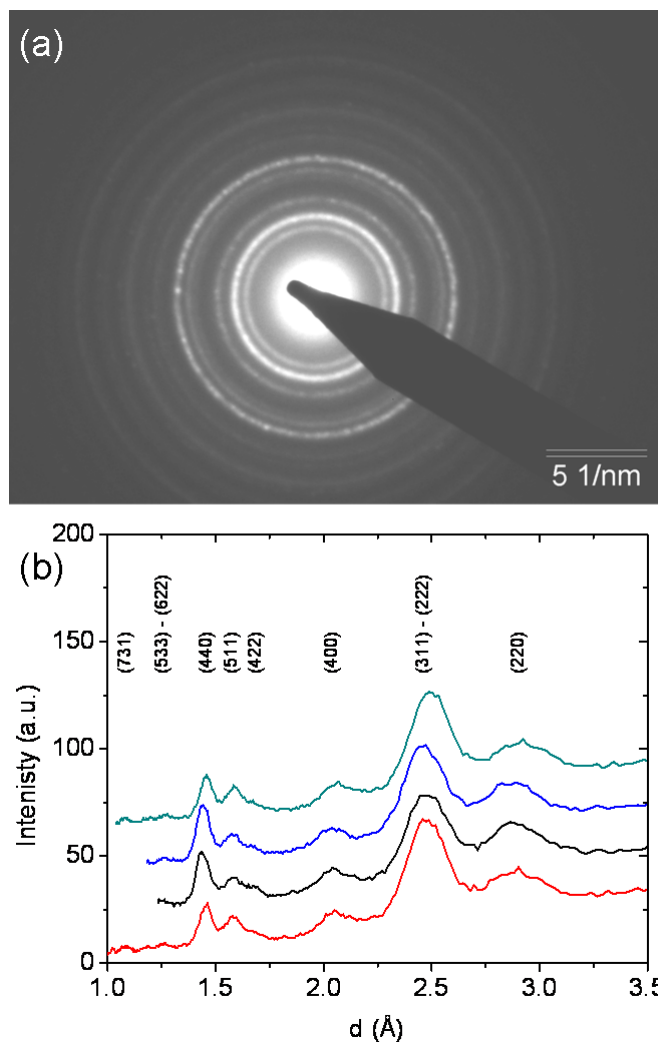
| Phase                                     | a/Å        | b/Å        | c/Å        | $\alpha$ | $\beta$ | $\gamma$ |
|---|------------|------------|------------|----------|---------|----------|
| Fe <sub>3</sub> O <sub>4</sub><br>(F3-3m) | 8.37704(3) | 8.37704(3) | 8.37704(3) | 90.0     | 90.0    | 90.0     |

**Figure S1.** Rietveld fit from X-ray powder diffraction pattern taken at room temperature for Fe<sub>3</sub>O<sub>4</sub>-OA SPNPs, refined in the Fd-3m space group. Experimental (red dots), calculated (black line) and difference (bottom solid blue line) profiles. Vertical bars represent positions of Bragg reflections for spinel. Cell parameters obtained. See details in Table S1.

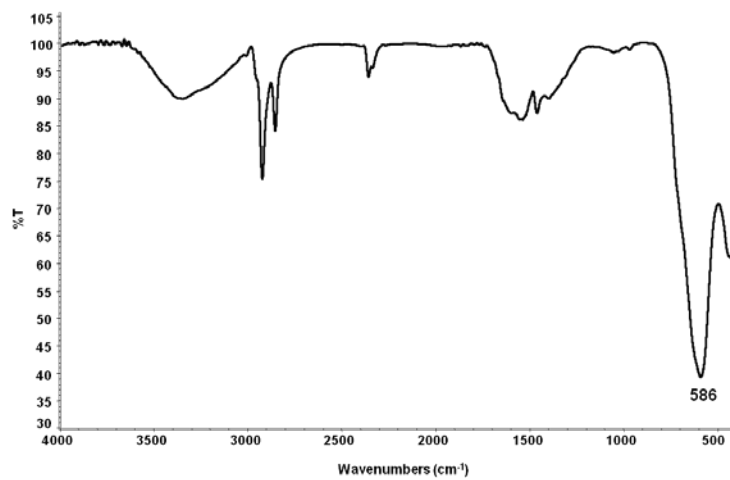


| Phase                                     | a/Å        | b/Å        | c/Å        | $\alpha$ | $\beta$ | $\gamma$ |
|---|------------|------------|------------|----------|---------|----------|
| Fe <sub>3</sub> O <sub>4</sub><br>(F3-3m) | 8.40433(4) | 8.40433(4) | 8.40433(4) | 90.0     | 90.0    | 90.0     |
| Pd<br>(Fm-3m)                             | 3.94719(2) | 3.94719(2) | 3.94719(2) | 90.0     | 90.0    | 90.0     |

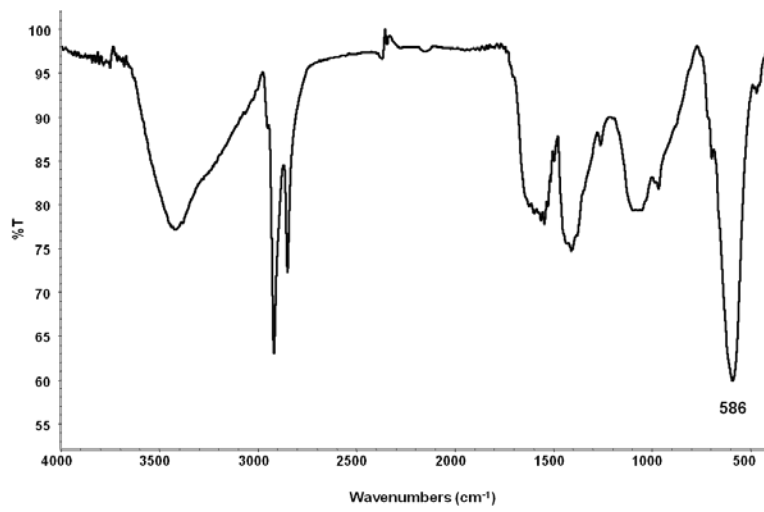
**Figure S2.** Rietveld fit from X-ray powder diffraction pattern taken at room temperature for Fe<sub>3</sub>O<sub>4</sub>@Pd-OA SPNPs, refined in the Fd-3m space group. Experimental (red dots), calculated (black line) and difference (bottom solid blue line) profiles. Vertical bars represent positions of Bragg reflections for spinel. Cell parameters obtained. See details in Table S2



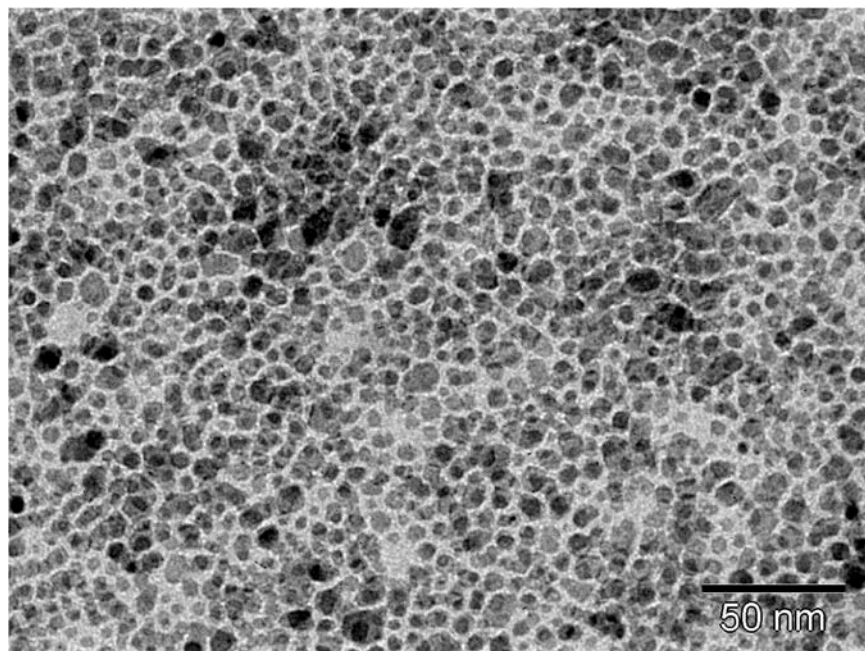
**Figure S3.** (a) Selected area electron diffraction (SAED) pattern of magnetite SPNPs. (b) several Intensity profiles of the SAED pattern as function of the interplanar distance  $d$ . The (hkl) indices correspond to the spinel structure of magnetite.



**Figure S4.** FT-IR Spectrum of  $\text{Fe}_3\text{O}_4$ -OA SPNPs



**Figure S5.** FT-IR Spectrum of Fe<sub>3</sub>O<sub>4</sub>@Pd-OA SPNPs



**Figure S6.** HR-TEM image of Fe<sub>3</sub>O<sub>4</sub>-OA SPNPs

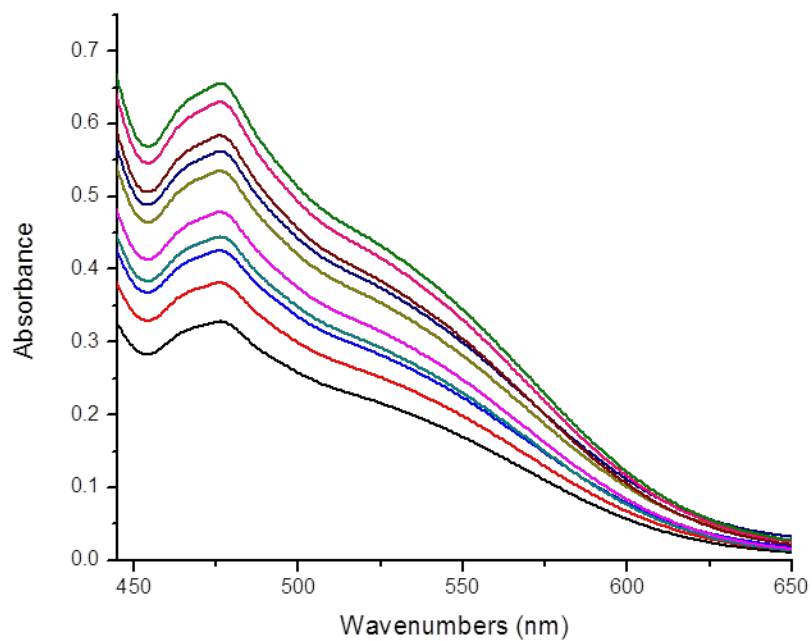


Figure S7. Spectral curves of [Fe(EDTA)]

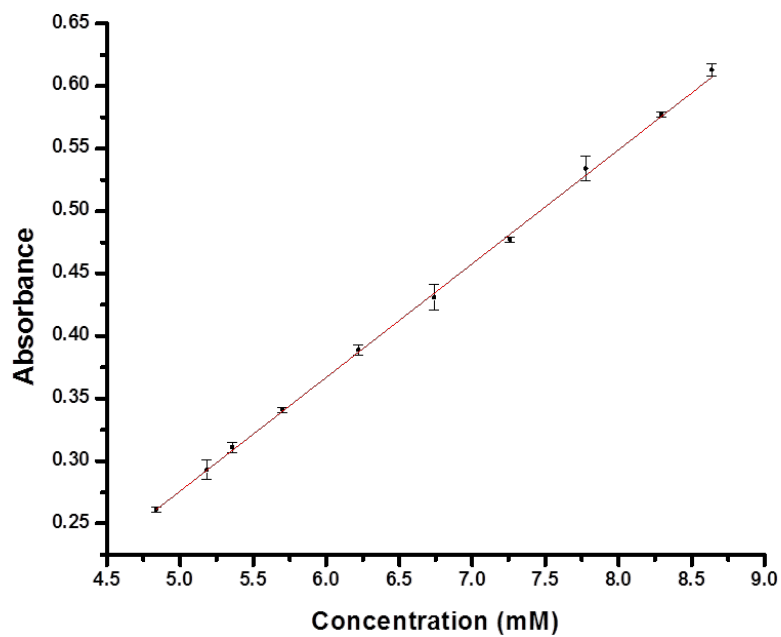


Figure S8. Calibration curve of [Fe(EDTA)]