

Electronic Supplementary Information

Precise Adjustment of Structural Anisotropy and Crystallinity on Metal-Fe₃O₄ Hybrid Nanoparticles and Its Influence on Magnetic and Catalytic Properties

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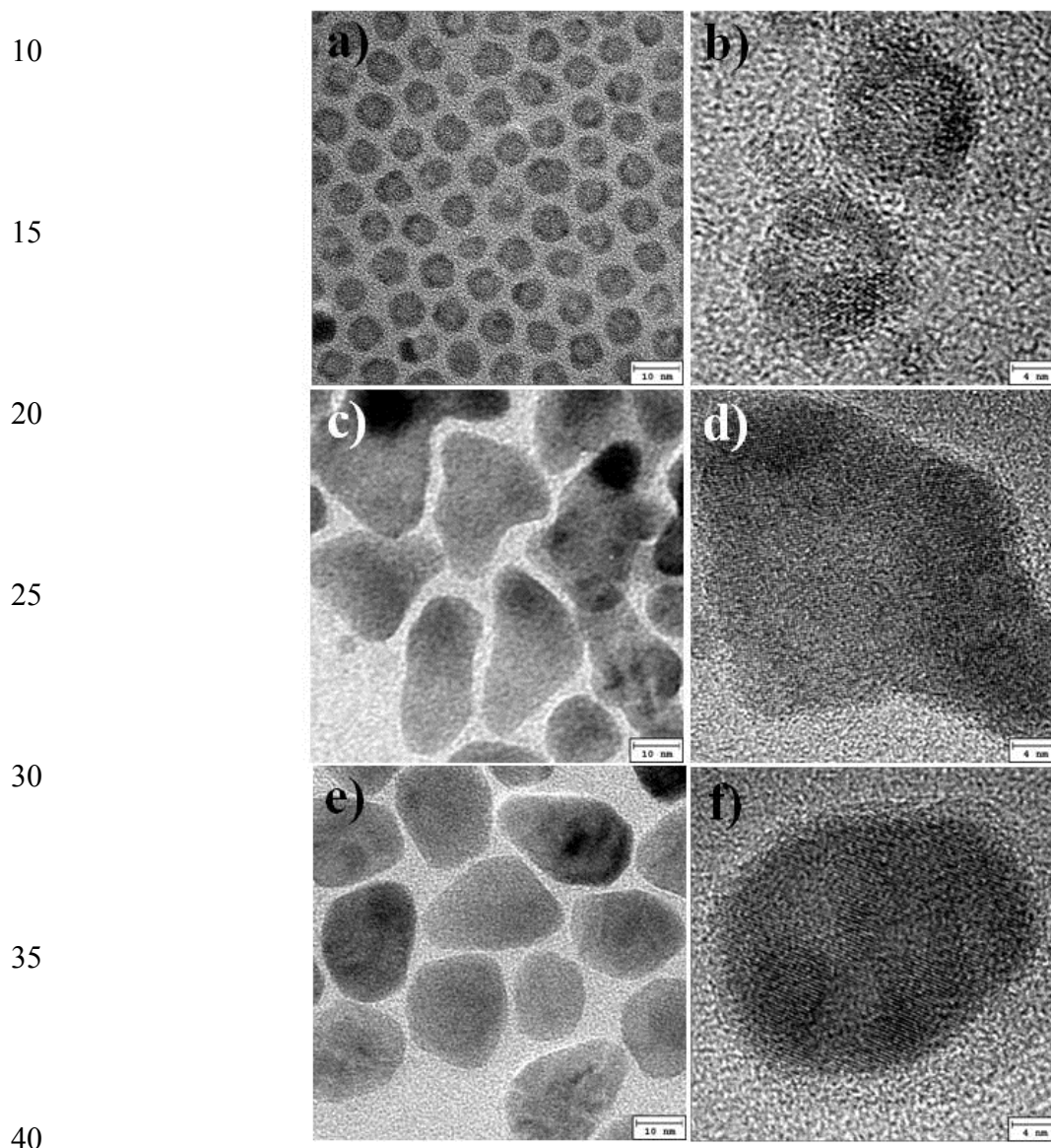


Fig. S1 TEM images of Fe₃O₄ NPs prepared under the reaction conditions identical to the synthetic process of **Pd-1**, **Pd-2** and **Pd-3** except for the injection of Pd seeds. a, b) **Pd-1**, c, d) **Pd-2** and e, f) **Pd-3** without Pd seed parts. The bars represent a,c,e) 10 nm and b,d,f) 4 nm, respectively.

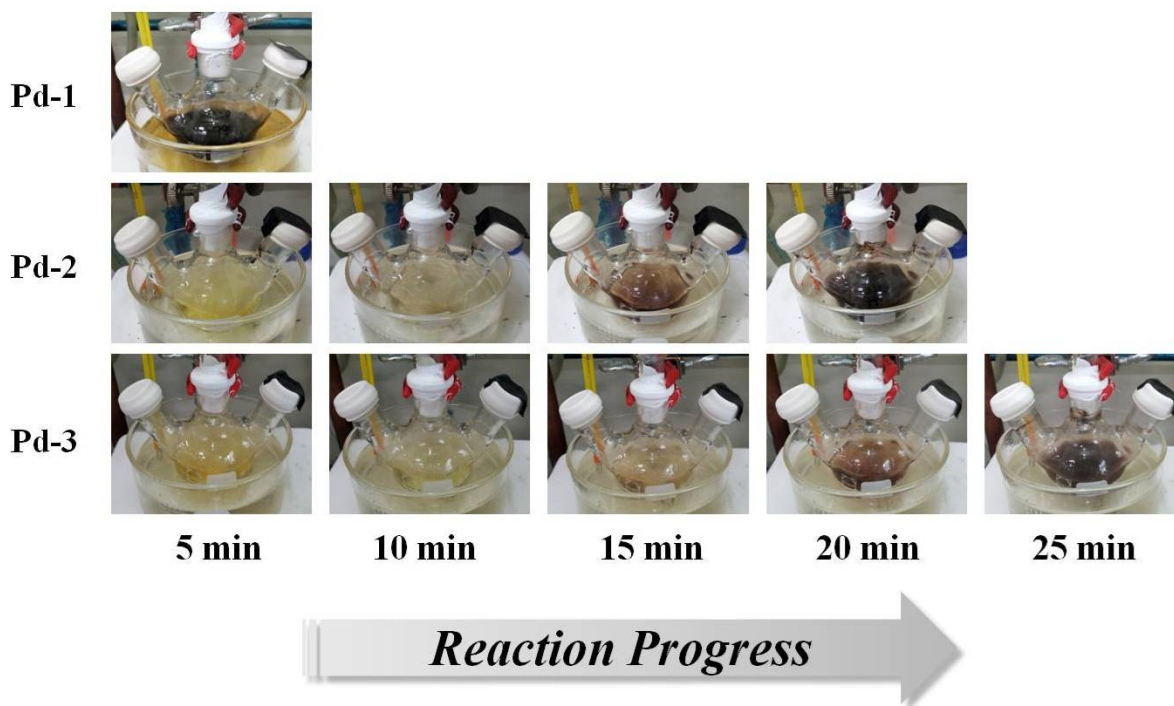
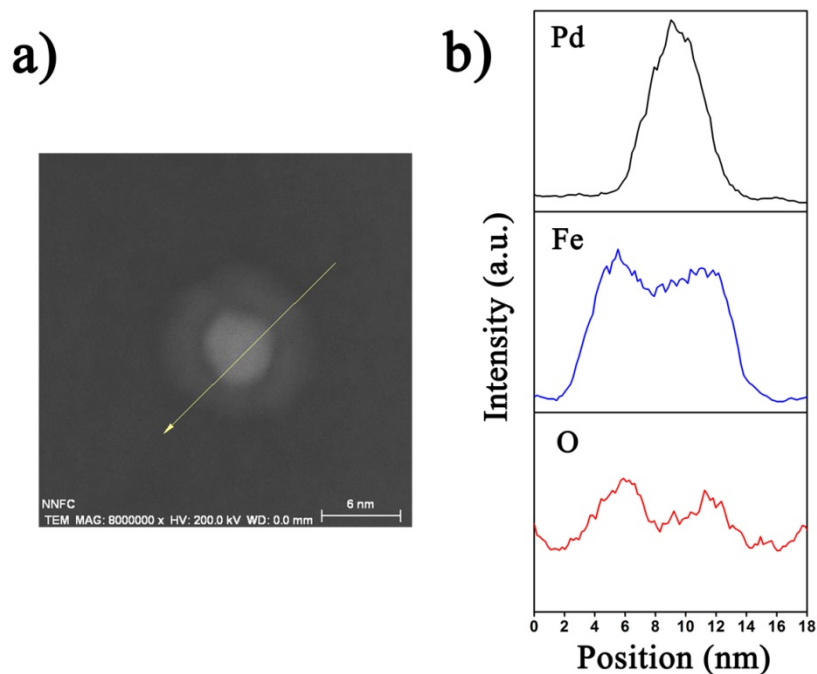


Fig. S2 Color changes of the reaction mixtures of **Pd-1**, **Pd-2** and **Pd-3** in the absence of metal seeds during the synthetic process (**Pd-1**, $\text{Fe}(\text{CO})_5$: OAm : OA = 1 : 8 : 0, **Pd-2**, 1 : 6 : 2.1, **Pd-3**, 1 : 4 : 4.2).

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10 Fig. S3 a) High-magnification HAADF-STEM image of a single **Pd-1** and b) spatial elemental distribution obtained from EDX line-scan measurement.

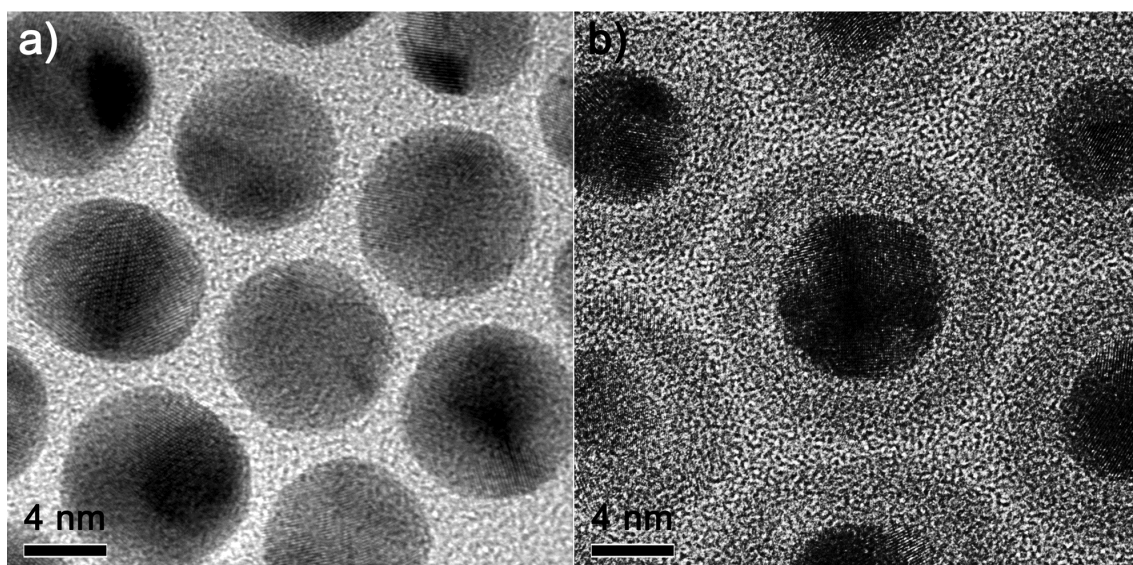


Fig. S4 TEM images of a) Au NPs and b) **Au-1** (Au@Fe₃O₄ yolk-shell NPs). The bright area between 5 Au core and Fe₃O₄ shell is the void area caused by Kirkendall effect.

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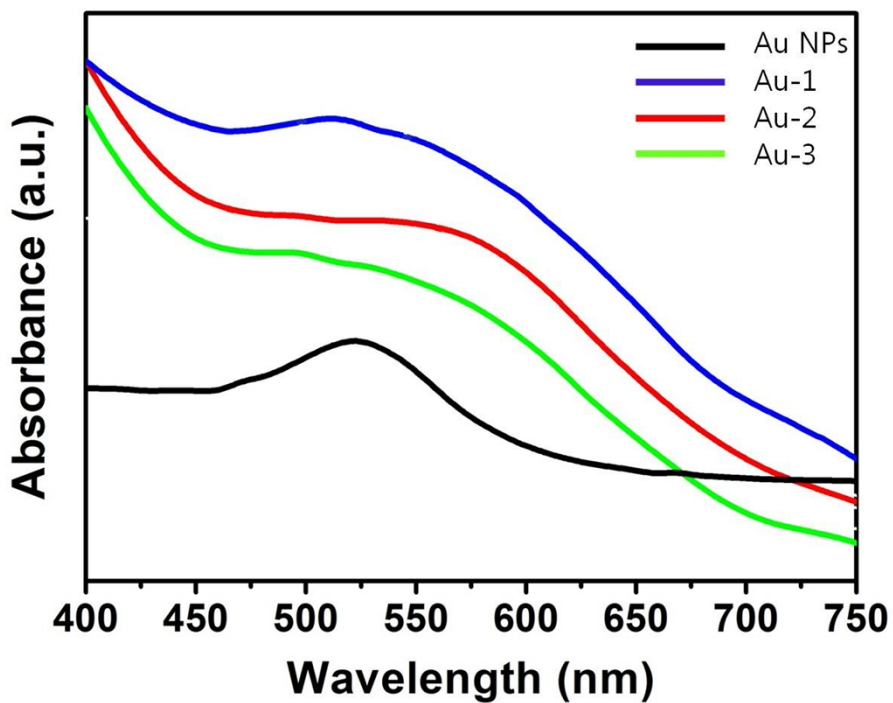


Fig. S5 UV-Vis spectra of Au NPs, **Au-1**, **Au-2**, and **Au-3**.