

## Supporting Information

# Synthesis of Multiple Platinum Attached Iron Oxide Nanoparticles

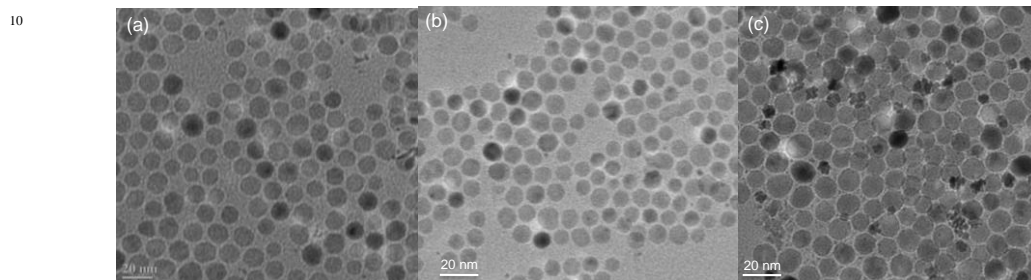
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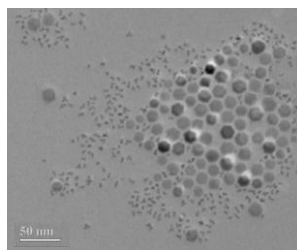
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1. Figure S1 shows a set of TEM images of Pt attachments onto different iron oxide seeds ( 2.5:1, 4:1, and 8:1 surfactant to precursor ratios). Compared to 2.5:1 and 4:1 ratio seeds, evident multiple attachments were observed using the 8:1 ratio seeds.



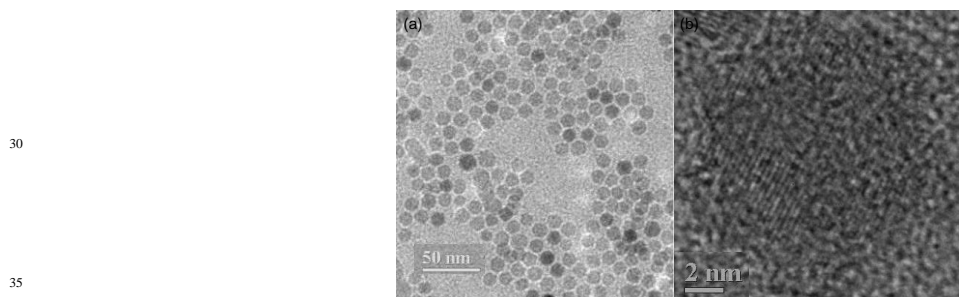
15 **Figure S1.** TEM images of Pt attachments onto different iron oxide seeds at surfactant to precursor ratios of (a) 2.5:1, (b) 4:1, and (c) 8:1.

2. With increasing Pt amount, self-nucleation of Pt NPs takes place, producing individual Pt NPs, as shown in Figure S2.



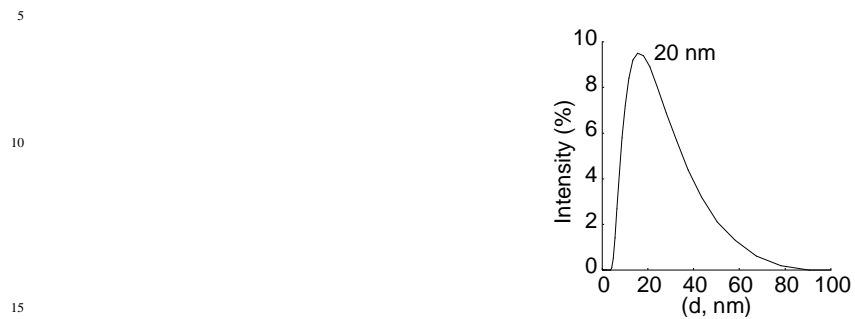
20 **Figure S2.** TEM image of self-nucleated Pt NPs at a 540:1 ratio of Pt precursor to iron oxide seeds

3. After synthesis, the multiple Pt-attached iron oxide NPs were transferred into aqueous solution through a surfactant exchange process as described in the experimental section. After surfactant exchange, the Pt NPs were still well attached to the iron oxide NP surfaces without notable dissociation, indicating good integrity of the dual component NPs. A representative TEM image of the NPs after surfactant exchange is shown in Figure S3. Because of the thicker polymer coatings, the HRTEM image cannot be well focused, but the rough surface can still be seen clearly.



**Figure S3.** A representative TEM image of the NPs after surfactant exchange (a) and the rough morphology can still be seen from the insert HRTEM (b).

4. Figure S4 shows the DLS plot of PAA-coated iron oxide NPs in water at pH 8. The hydrodynamic diameter of the particles is mainly centered around 20 nm, but the extended tail suggests some level of aggregation of NPs after surfactant exchange.



**Figure S4.** The DLS plot of PAA-coated iron oxide NPs in water at pH 8.