Supplementary Information

Synthesis of Catalytically Active Gold Clusters on the Surface of Fe_3O_4@SiO_2 Nanoparticles

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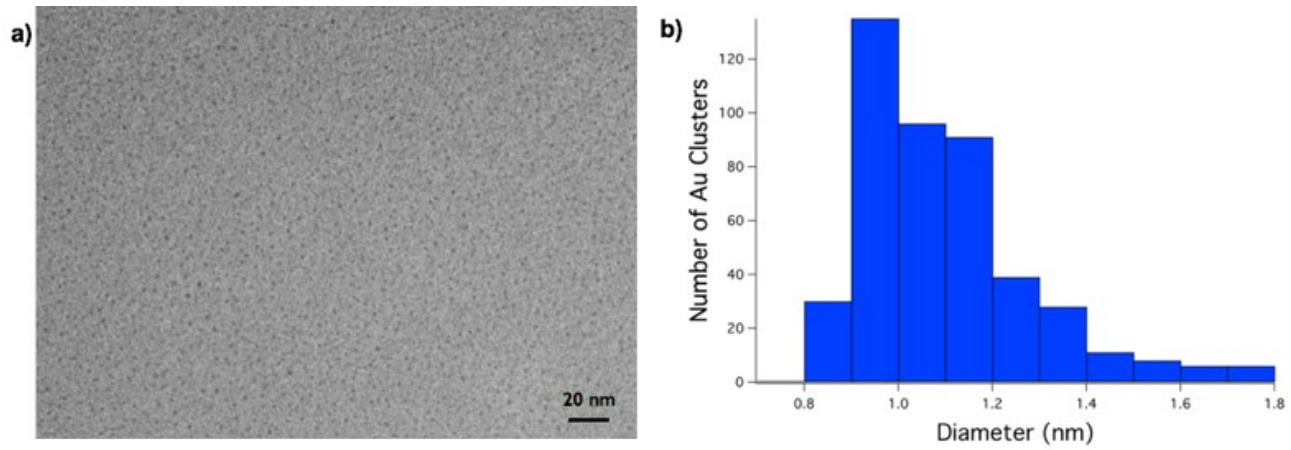

Figure S1. a) TEM image of the Au clusters obtained in water by simply mixing 25 μL of $HAuCl_4$ 30 mM and 10 mL of TTMAPP porphyrin 0.1 mM at acidic pH. b) Size distribution of the synthesized Au clusters calculated using Image J v1.50i.

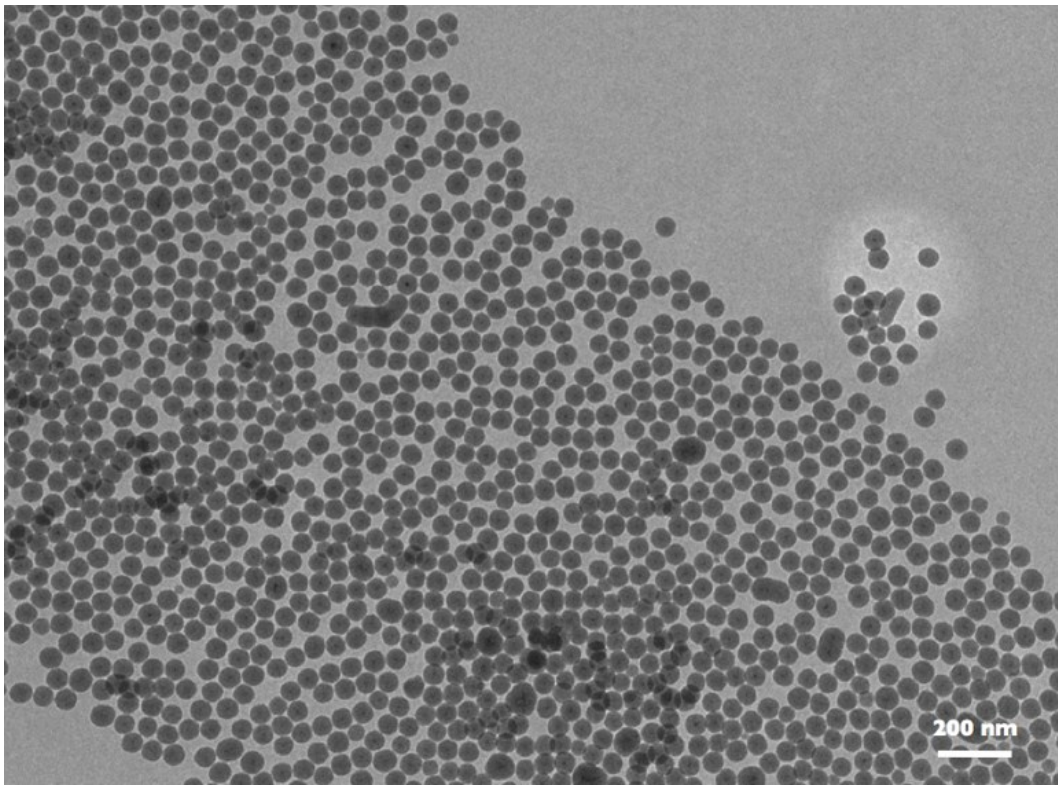

Figure S2. TEM micrograph showing Fe_3O_4@SiO_2 nanoparticles obtained in high yield with a homogenous size distribution.

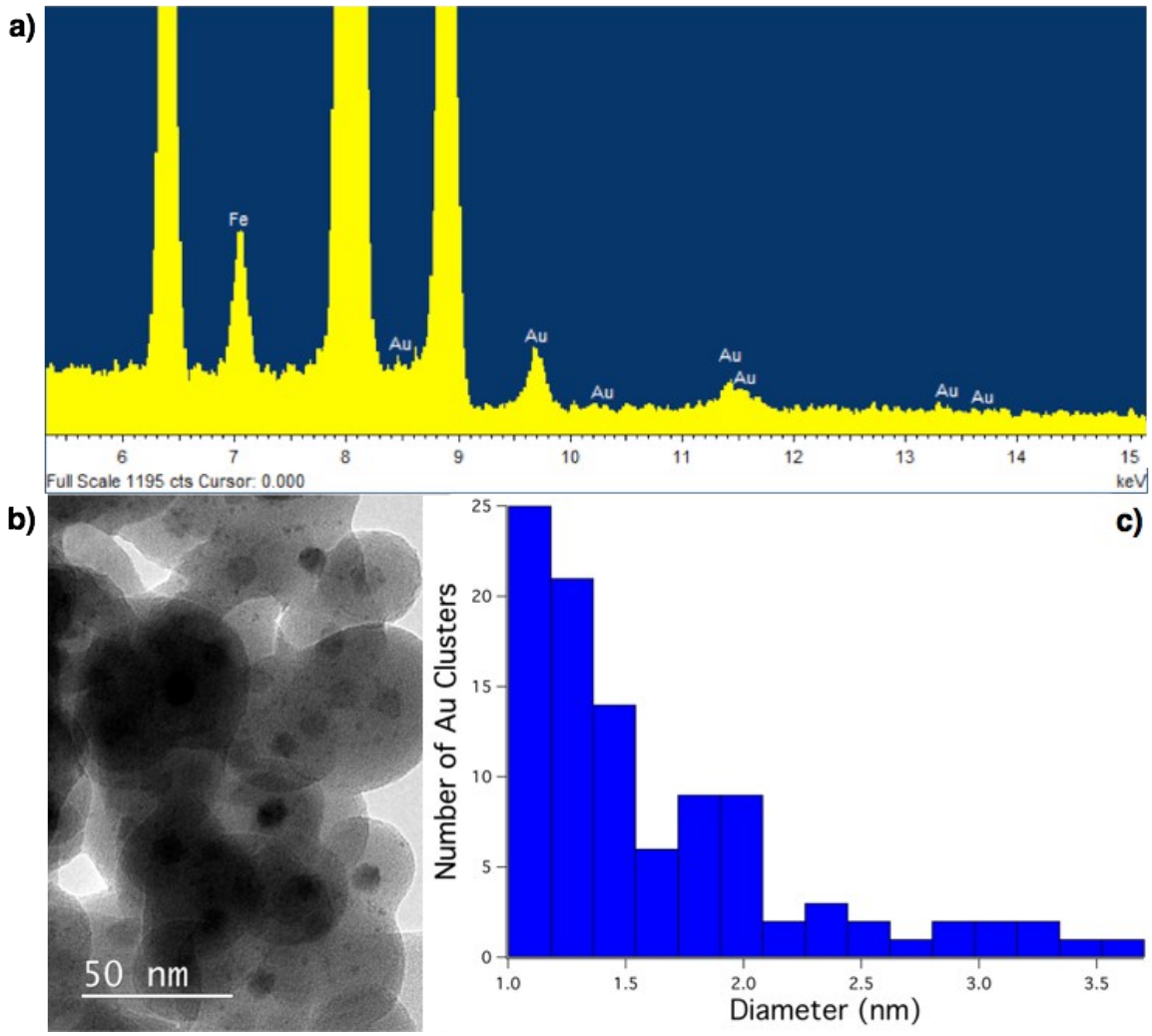

Figure S3. a) Energy Dispersive X-ray Spectroscopy (EDS) confirms the presence of Au onto the surface of the Fe_3O_4@SiO_2 nanoparticles. The quantification of the elements composing the system was 8.45% of Fe, 89.29% of Si, and 2.26% of Au found on the Fe_3O_4@SiO_2@Au nanoparticles analyzed in image b). c) Representation of the size distribution of the Au clusters deposited on SiO_2 nanoparticles.

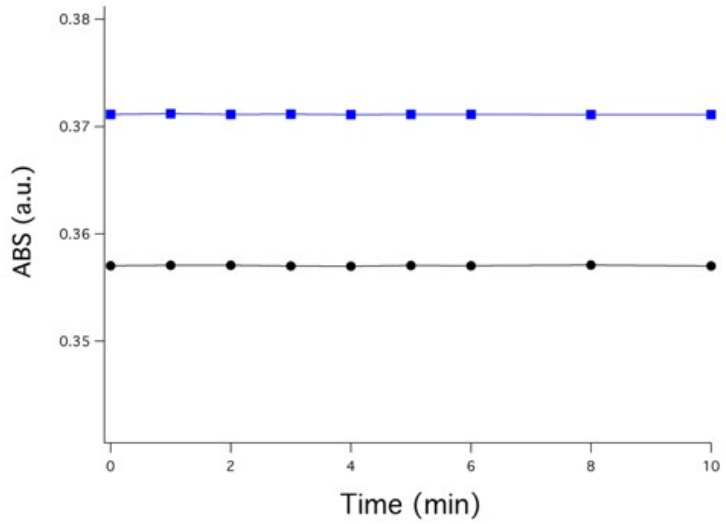

Figure S4. Control experiments were performed by measuring the absorbance at 400 nm during 10 minutes of the system composed by 200 µL of 4-NP (2 mmol L^{-1}), 1.4 mL of $NaBH_4$ (100 mmol L^{-1}) and 1.4 mL of H_2O represented by the blue line, and the black line represents the same system after adding 20 µL of the $Fe_3O_4@SiO_2$ with encapsulated TTMAPP.

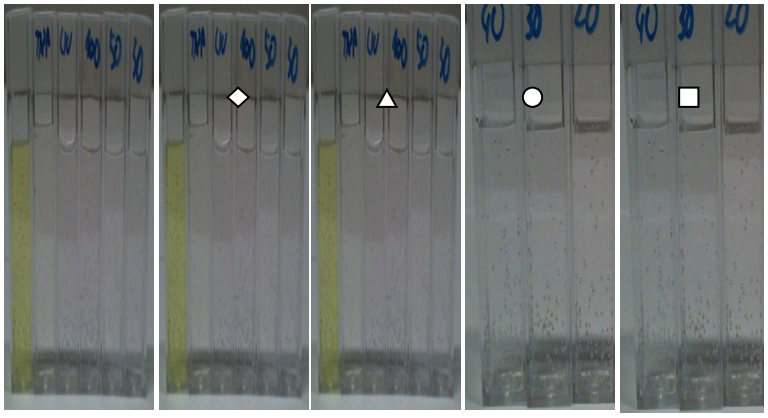

Figure S5. From left to right, cuvettes showing the resulting solutions after using different amounts of $Fe_3O_4@SiO_2@Au$ nanoparticles: 0, ◇0.66, △1.00, ○1.65, and □3.30 µg. The intense yellow color indicates the formation of the 4-nitrophenolate ions after $NaBH_4$ addition.