Supporting Information

Ultradispersed Palladium Nanoparticles in Three-Dimensional Dendritic Mesoporous Silica Nanospheres: Toward Highly Active and Stable Heterogeneous Catalysts

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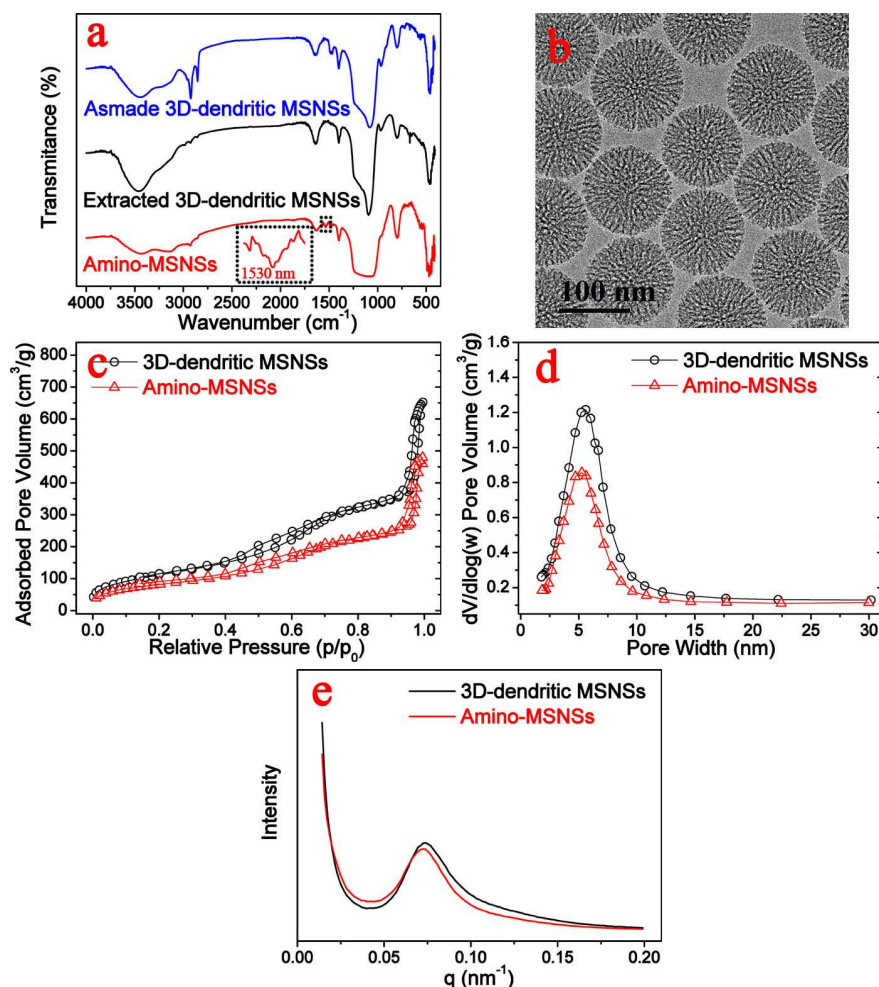
Figure S1. FTIR spectra (a) of the asmade 3D-dendritic MSNSs, the extracted 3D-dendritic MSNSs (black) and the amino-MSNSs (red); TEM image of the extracted 3D-dendritic MSNSs (b); nitrogen adsorption-desorption isotherms (c) and pore size distribution (d) of the extracted 3D-dendritic MSNSs (black) and the amino-MSNSs (red); SAXS patterns (e) of the extracted 3D-dendritic MSNSs (black) and the amino-MSNSs (red).
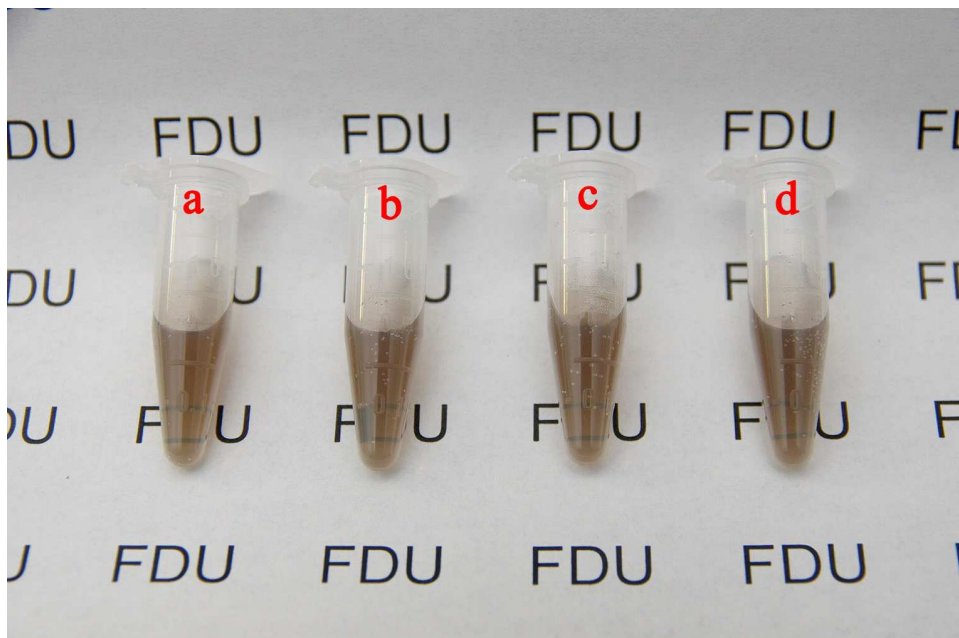
Figure S2. The optical photograph of the aqueous solution of the Pd-MSNSs with the concentration of 4 mg/ml: (a) Pd-MSNSs-10, (b) Pd-MSNSs-30, (c) Pd-MSNSs-50, and (d) Pd-MSNSs-70.
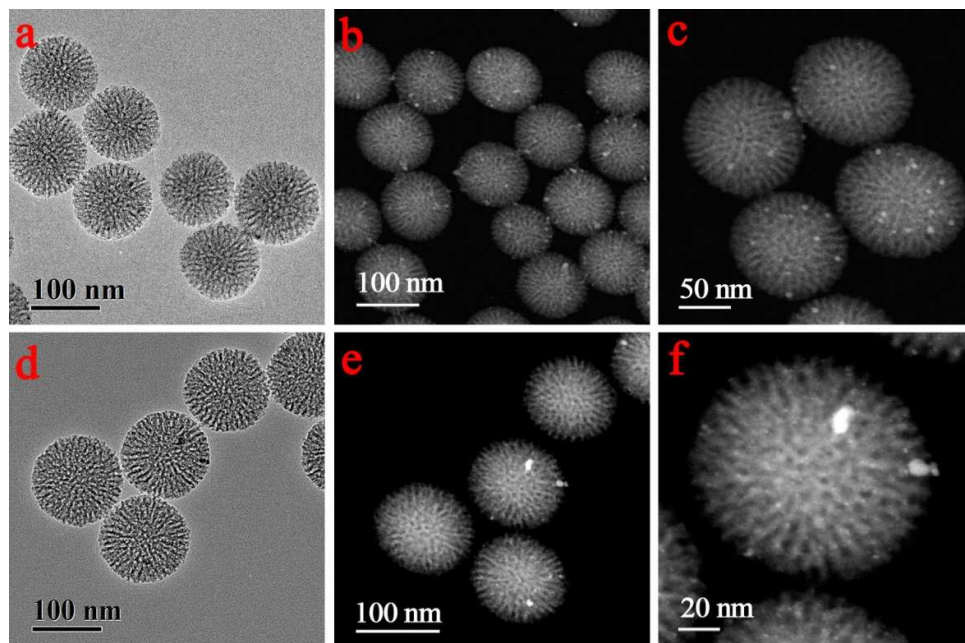
Figure S3. TEM images (a, d) and HAADF-STEM images (b, c, e, f) of Pd-MSNSs-10 (a, b, c) and Pd-MSNSs-70 (d, e, f) prepared via the *in-situ* growth approach.
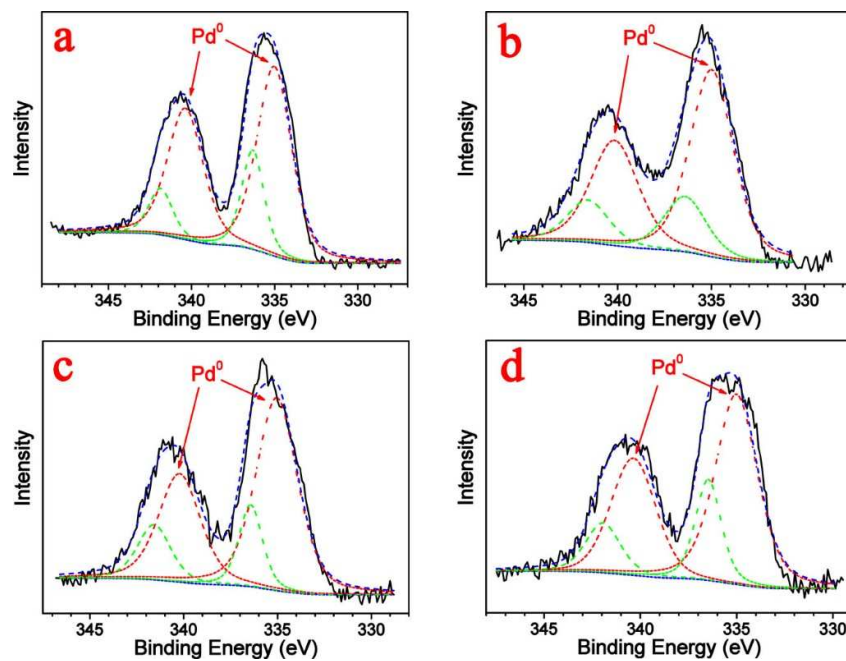
Figure S4. XPS spectra of Pd-MSNSs-10 (a); Pd-MSNSs-30 (b); Pd-MSNSs-50 (c) and Pd-MSNSs-70 (d).
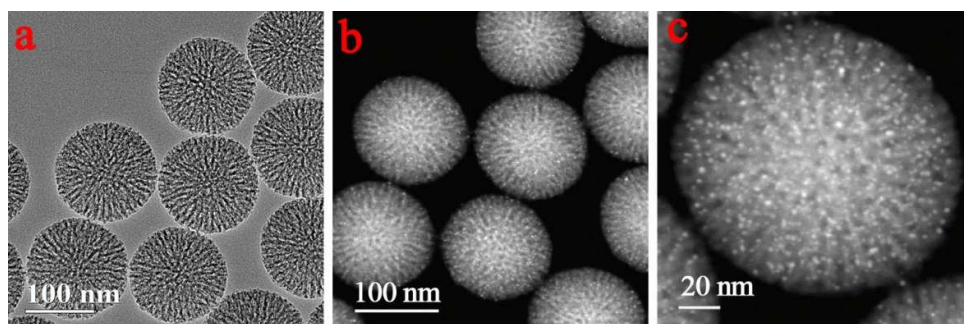
Figure S5. TEM image (a) and HAADF-STEM images (b, c) of the sample 3D-dendritic MSNSs immobilized with Au nanoparticles *via* the *in-situ* growth approach.