Supporting Information

Ethylene Glycol-Assisted Coating of Titania on Nanoparticles

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Figure S1. UV-Vis absorption spectra of (a) silver nanoplates and (b) gold nanorods before and after coating with titanium glycolate.
**Figure S2.** UV-Vis absorption spectra of gold nanorods indicating peak position changes after coating with different thicknesses of titanium glycolate.

**Figure S3.** TEM images of resorcinol-formaldehyde polymer sphere (a) before coating (b) after a single coating and (c) after four coatings with titanium glycolate precursor.
**Figure S4.** TEM images of SiO$_2$ and RF polymer microspheres before (a,c) and after (b,d) coating with titanium glycolate.

**Figure S5.** Enlarged Raman spectra of titanium glycolate coatings on gold nanorods after refluxing, indicating anatase crystal phase. $\lambda_{ex} = 532$ nm.
Figure S6. Low magnification TEM images of hollow TiO$_2$ shells obtained by calcination of SiO$_2$@titanium glycolate, followed by etching. Samples shown were calcined at (a) 400, (b) 600, (c) 800, and (d) 900 °C.

Figure S7. N$_2$ physisorption isotherm for hollow TiO$_2$ sample calcined at 700 °C.