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Facile *in Situ* Synthesis of Visible-Light Plasmonic Photocatalysts M@TiO_2 (M = Au, Pt, Ag) and Evaluation of Their Photocatalytic Oxidation of Benzene to Phenol

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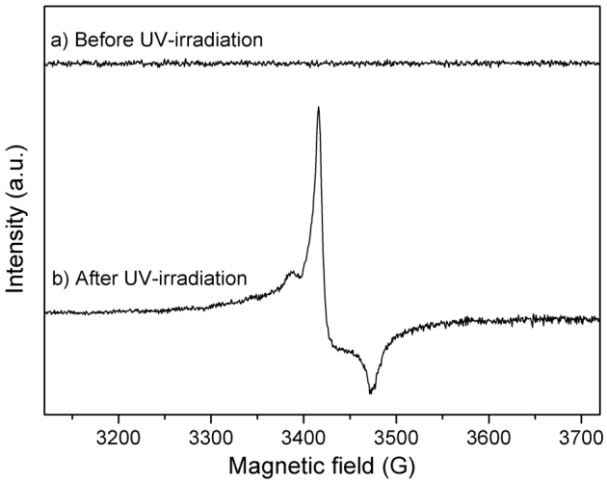

Fig. S1 The EPR spectrum of naked TiO_2-microspheres before and after UV-irradiation.

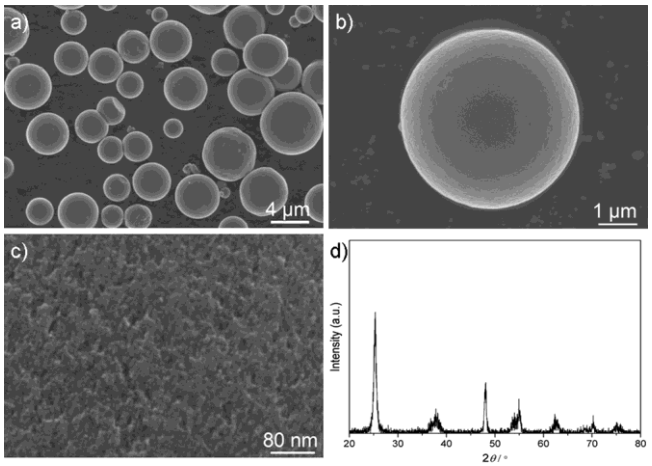

Fig. S2 a–c) SEM images and d) XRD pattern of the naked TiO_2-microspheres.

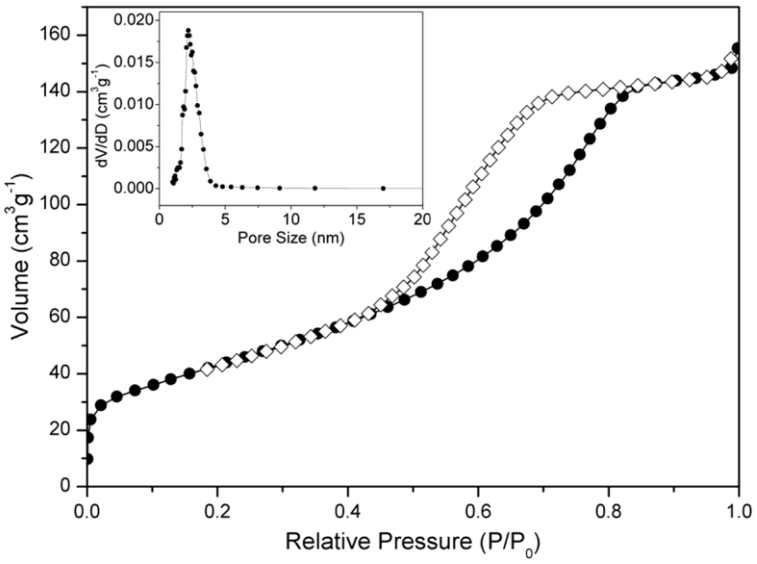

Fig. S3 Nitrogen adsorption (●) –desorption (□) isotherm and corresponding pore size distributions (inset) of the naked TiO_2-microspheres.

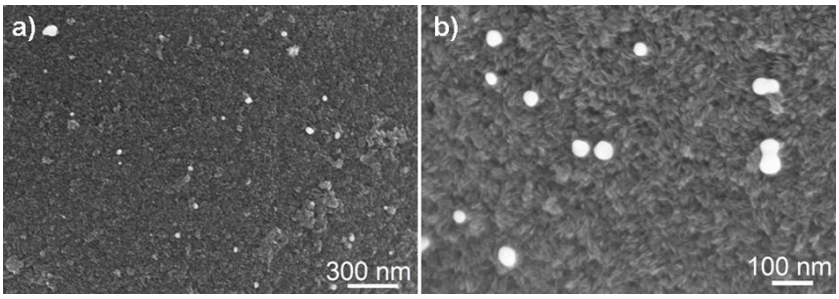

Fig. S4 SEM images of Au@TiO_2-microspheres prepared by the traditional photo-deposition route with loading amount of 1 wt%.

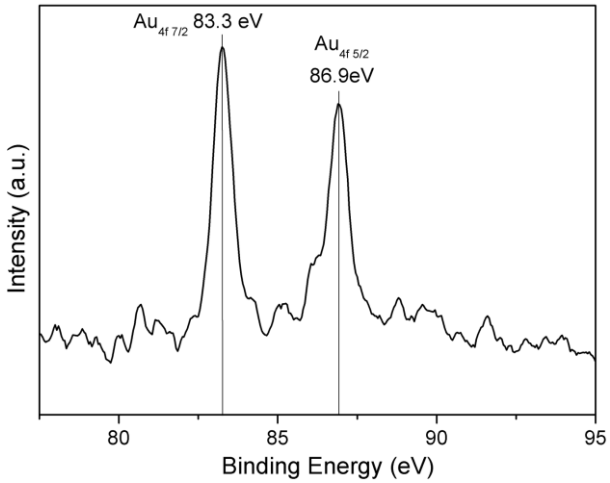

Fig. S5 XPS spectra of Au 4f of Au@TiO_2-microspheres.

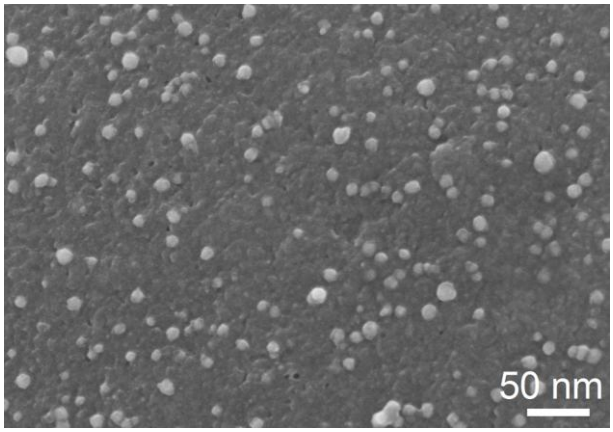

Fig. S6 High-magnification SEM image of Au@TiO_2-microspheres with loading amount of 1 wt %.

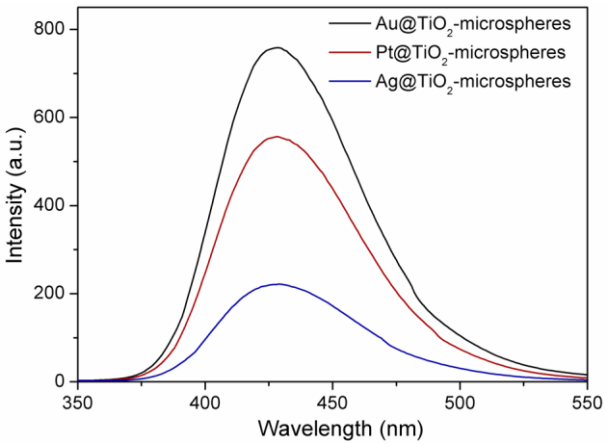

Fig. S7 Fluorescence spectra of the samples irradiated by the visible light ($\lambda \geq 400$ nm) in 3 mM terephthalic acid under irradiation for 180 min.

Table S1 UV-light-induced catalytic oxidation of benzene in the absence (left column) and present (right column) of phenol.[a]

	Residual reactant (%)	
Photocatalyst	benzene	benzene/phenol
TiO_2-microspheres	34	37/29
Au@TiO_2-microspheres (1 wt%)	25	26/20

[a] The amounts of the initially added benzene and phenol are both 1200 ppm. The reaction time is 5 h.