Electronic Supplementary Material (ESI) for Energy & Environmental Science

Supplemental Document: "Plasmon Resonant Enhancement of Dye Sensitized Solar Cells"

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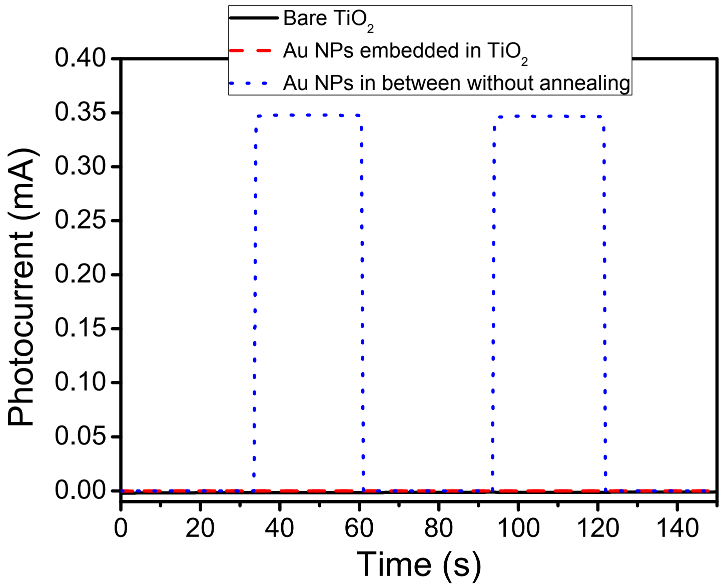
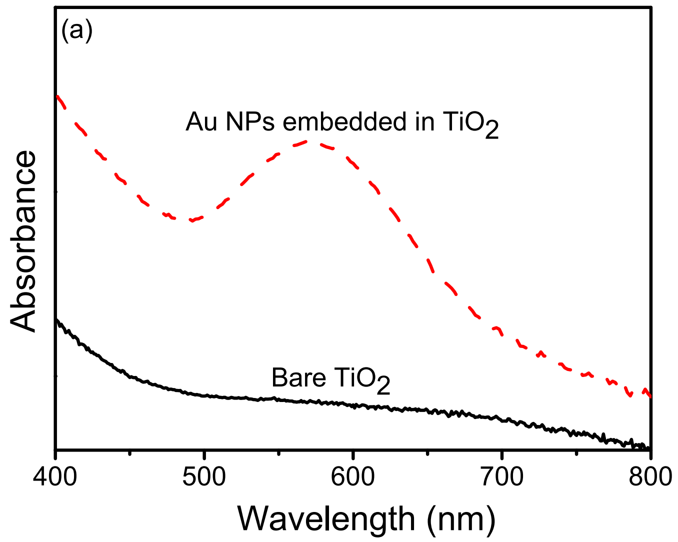


Figure S1. Short-circuit photocurrents of DSSCs with bare TiO_2, Au nanoparticles embedded in TiO_2 without dye molecules, and 5 nm Au thin film without the second annealing deposited between the TiO_2 layer and the dye monolayer as working electrodes.



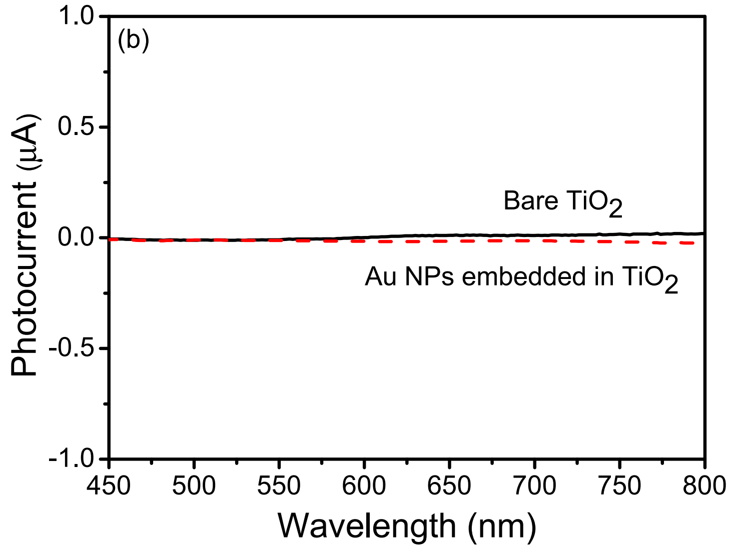


Figure S2. (a) Absorption spectra of bare TiO_2 and Au nanoparticles embedded in TiO_2 without dye molecules. (b) Photocurrent spectra of photovoltaic cells with bare TiO_2 and Au nanoparticles embedded in TiO_2 without dye molecules as working electrodes.

The power conversion efficiency η of the solar cells is determined by

$$\eta(\%) = \frac{V_{oc} I_{sc} FF}{P_{in} S} \times 100 \tag{1}$$

where V_{oc} is the open-circuit photovoltage, I_{sc} is the short-circuit photocurrent, and $P_{in}S$ is the incident laser power times the working electrode area (60 mW). The fill factor FF is given by

$$FF = \frac{V_{\mathrm{m}} I_{\mathrm{m}}}{V_{oc} I_{sc}} \tag{2}$$

where V_m and I_m are the voltage and the current at the maximum output power point, respectively.

Table S1 Comparison of photovoltaic device performances of Au nanoparticle/dye/TiO_2 configuration #**2** with and without the second annealing.

Working Electrode	V_{oc} (V)	I_{sc} (mA)	FF(%)	η (%)
Without annealing	0.48	0.34	52	0.14
With annealing	0.73	0.86	58	0.60