Electrocatalytic Effect on the Photon-to-Current Conversion Efficiency of Gold-Nanoparticle-Loaded Titanium(IV) Oxide Plasmonic Electrode for Water Oxidation

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Figure S1. SEM-EDX elemental mapping for a sample prepared by the hydrothermal method.

Figure S2. HR-TEM image of Au NPs on rutile TiO$_2$-NWA.
Cu shell thickness estimation

Au mean size \( d_{\text{Au}} = 5.8 \text{ nm} \)

Dispersion (the ratio of surface atom to total atom in nanoparticle) = 0.155

Au loading amount per apparent unit surface area = 63.2 nmol cm\(^{-2}\)

Cu loading amount per apparent unit surface area = 6.85 nmol cm\(^{-2}\)

Cu shell number = \((\text{Cu atom number}) / (\text{Au surface atom number})\)

\[ = \frac{(6.85 \text{ nmol cm}^{-2} \times \text{Avogadro constant})}{(63.2 \text{ nmol cm}^{-2} \times \text{Avogadro constant} \times \text{dispersion})} \]

\[ = 0.70 \]

Figure S3. XPS spectra of Au@Cu/TiO\(_2\)-NWA.
Figure S5. Photochronoamperograms for Au/mp-TiO$_2$/FTO, Au/TiO$_2$-NWA, and Au@Cu/TiO$_2$-NWA electrodes at the rest potential in the dark under visible-light irradiation ($\lambda > 430$ nm, light intensity = 100 mW cm$^{-2}$).

Figure S4. HR-TEM images of Au@Cu/TiO$_2$-NWA.
Figure S6. Current-potential curves for Au/mp-TiO$_2$/FTO, Au/TiO$_2$-NWA, and Au@Cu/TiO$_2$-NWA electrodes at the rest potential in the dark under visible-light irradiation ($\lambda > 430$ nm, light intensity = 100 mW cm$^{-2}$).