Electronic Supplementary Material (ESI) for Nanoscale.
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Supporting Information

Plasmon-driven water splitting enhancement on plasmonic metal-insulator-semiconductor hetero-nanostructures: unraveling the crucial role of interfacial engineering

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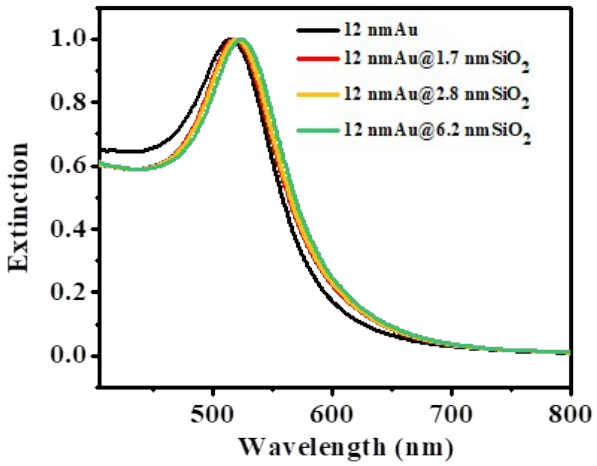

Fig. S1 UV-Vis spectra of AuNPs and Au@SiO_2 NPs with different silica shell thicknesses.

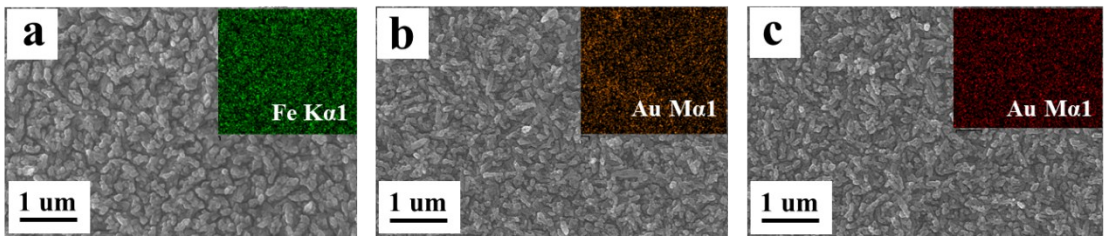

Fig. S2 SEM image of (a) the hematite nanorods array, (b) F-Au, (c) F-Au@SiO_2 nanorods array. Inset: element mapping images of Fe and Au.

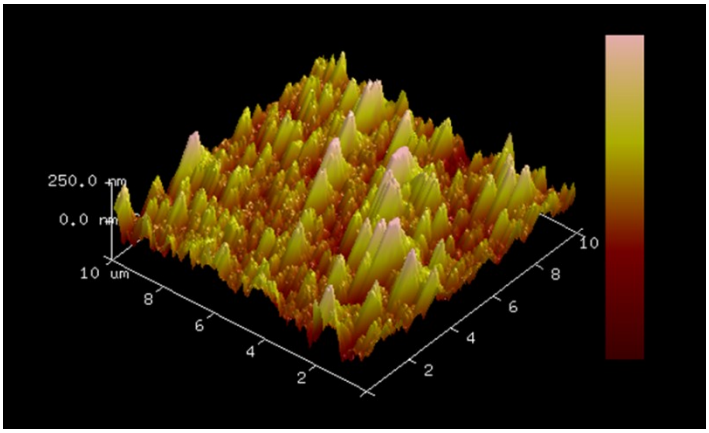

Fig. S3 3D AFM image analysis of the hematite nanorods array.

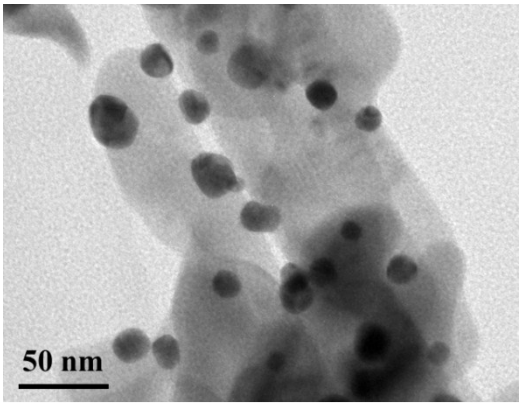

Fig. S4 Typical TEM images of the as-prepared F-Au nanorods array.

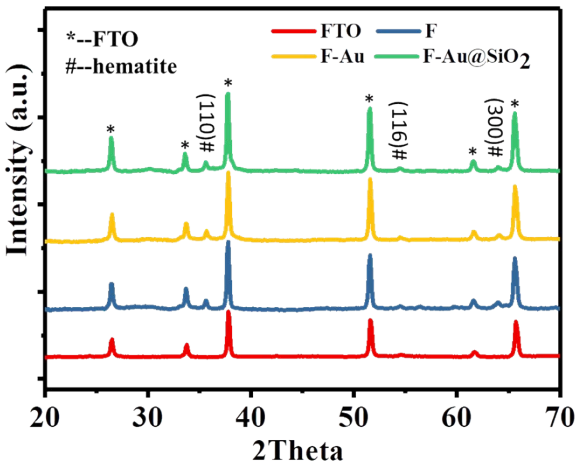

Fig. S5 X-ray diffraction (XRD) spectra of the hematite, F-Au and F-Au@SiO_2 nanorods array.

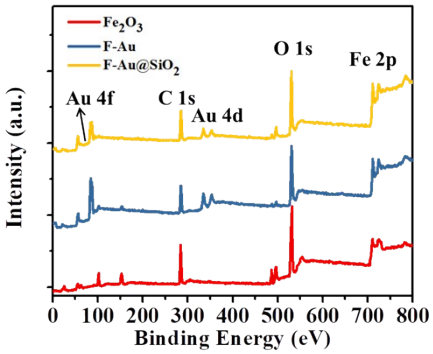

Fig. S6 The full XPS spectra of Fe_2O_3, F-Au and F-Au@SiO_2 nanorods array.

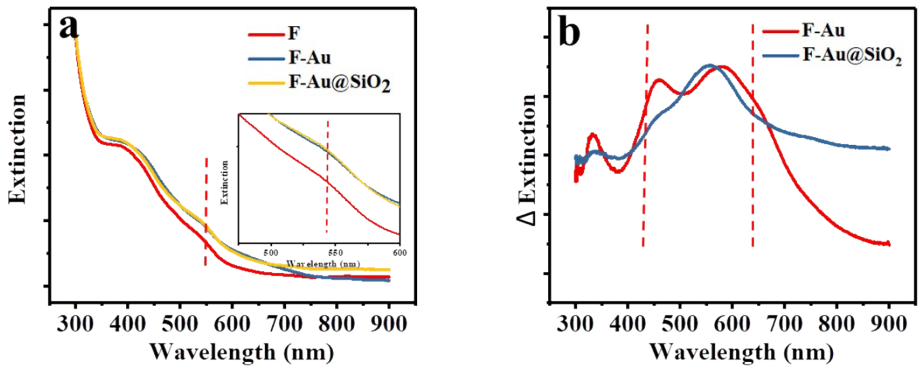

Fig. S7 (a) UV-Vis extinction spectra and (b) difference extinction spectra of the tested samples.

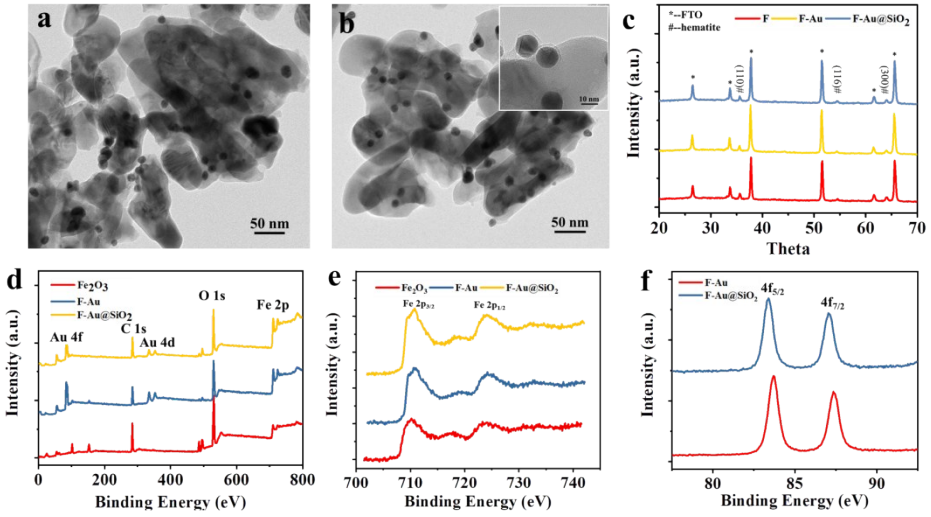

Fig. S8 TEM image of F-Au (a) and F-Au@SiO_2 (b) after the PEC tests. Inset: high-magnification TEM images of the F-Au@SiO_2. (c) XRD, (d) full XPS spectra, (e-f) XPS in the Fe 2p (e) and Au 4f (f) region of the hematite, F-Au and F-Au@SiO_2 nanorods array after the PEC tests.

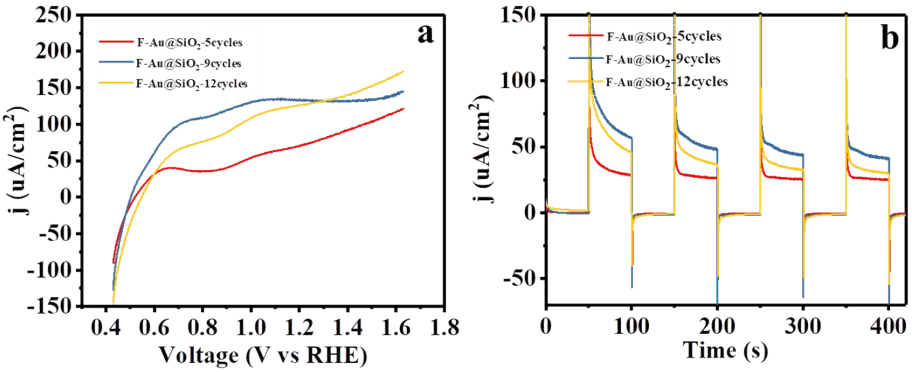

Fig. S9 (a) LSV curves, (b) on-off transient current response of the F-Au@SiO_2 anodes with different Au/Fe mass ratio. (note: the Au/Fe mass ratio of 5 cycles, 9 cycles and 12 cycles is ~4.1%, 10% and 17%, respectively.)

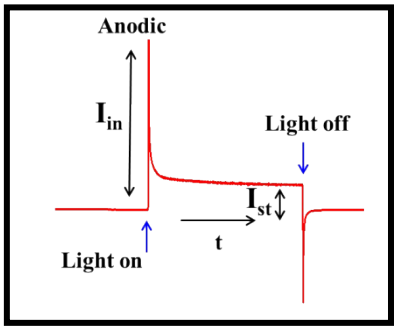

Fig. S10 Anodic photocurrent dynamics model of the photoanodes.

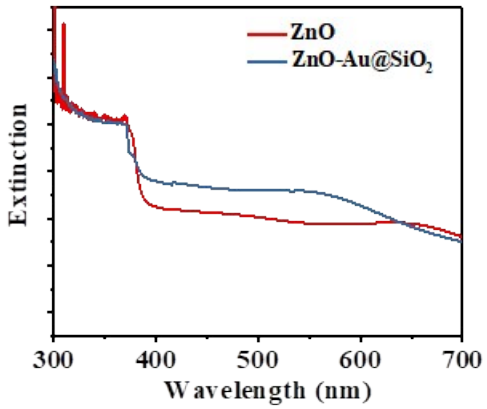

Fig. S11 UV-Vis spectra of the ZnO and ZnO-12.5 nm Au@1.7 nm SiO_2 NPs nanoarrays.