Supporting Information

**Light absorption modulation of novel Fe$_2$TiO$_5$ inverse opals for photoelectrochemical water splitting**

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![Fig. S1 XRD pattern of FTO substrate](image)

![Fig. S2 Low-magnification (a) and High-magnification (b) SEM images of colloidal crystal templates self-assembled from PS spheres.](image)
Fig. S3 EDS spectrum of Fe$_2$TiO$_5$-based inverse opal photoanodes.

Fig. S4 HR-TEM images of as-synthesized Fe$_2$TiO$_5$ nanoparticles.

Fig. S5 SEM image of disordered porous Fe$_2$TiO$_5$ film, using disordered PS nanoparticles as template.
Fig. S6  Linear scan voltammetry (LSV) of Fe$_2$TiO$_5$ IO-250, disordered porous Fe$_2$TiO$_5$ and disordered Fe$_2$TiO$_5$ under full arc irradiation.

Fig. S7  (a) Linear scan voltammetry (LSV) of Fe$_2$O$_3$, TiO$_2$ and Fe$_2$TiO$_5$ photoanodes under full arc irradiation; (b) Linear scan voltammetry (LSV) of Fe$_2$O$_3$, Fe$_2$TiO$_5$ and TiO$_2$ photoanodes under visible light irradiation.