Supporting Information

The Crystalline/Amorphous Contact in Cu₂O/Ta₂O₅ Heterostructures: Increasing Its Sunlight-Driven Overall Water Splitting Efficiency

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Fig. S1 The XRD pattern of pure amorphous Ta₂O₅ hollow spheres.

Fig. S2 The XRD pattern of pure crystalline Ta₂O₅ hollow spheres.
Fig. S3 (a) The XRD pattern of crystalline Cu$_2$O/crystalline Ta$_2$O$_5$ heterostructure. (b)(c)(d) The HRTEM images of interface between the crystalline Cu$_2$O and crystalline Ta$_2$O$_5$.

Fig. S4 (a) The TEM image and (b) HRTEM image of Pt decorated Cu$_2$O/amorphous Ta$_2$O$_5$ heterostructure.
**Fig. S5** The XRD pattern of Cu$_2$O/amorphous Ta$_2$O$_5$ heterostructure after 1 hour water splitting test.

**Fig. S6** The band structure diagram of CuO/Cu$_2$O/amorphous Ta$_2$O$_5$ heterostructure.