Supporting Information for
Dual-functional photocatalysis for hydrogen evolution from
industrial wastewaters

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Fig. S1. SEM image of Cu$_2$O cube in low magnitude. The scale bar represents 1 $\mu m$. 

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**Fig. S2.** SEM image of Cu$_2$O truncated cube in low magnitude. The scale bar represents 1 $\mu$m.

**Fig. S3.** SEM image of Cu$_2$O cuboctahedron in low magnitude. The scale bar represents 1 $\mu$m.
**Fig. S4.** SEM image of Cu$_2$O truncated octahedron in low magnitude. The scale bar represents 1 $\mu m$.

**Fig. S5.** SEM image of Cu$_2$O octahedron in low magnitude. The scale bar represents 1 $\mu m$. 
**Fig. S6.** Cu 2p XPS pattern of Cu$_2$O.

**Fig. S7.** The absorbance variation of the RhB solution without photocatalyst (characteristic wavelength is set as 554 nm).
**Fig. S8.** Cycling tests of the photocatalyst under AM 1.5 irradiation.

**Fig. S9.** The absorbance variation of the MO solution without photocatalyst (characteristic wavelength is set as 464 nm).
Fig. S10. The absorbance variation of the MB solution without photocatalyst (characteristic wavelength is set as 664 nm).