Supporting Information

Does Intrinsic Photocontrollable Oxidase-Mimicking Activity of 2-Aminoterephthalic Acid Dominate the Activity of Metal–Organic Framework?

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Equipments.

UV-visible absorption spectra were obtained using a UV-2550 UV-vis spectrophotometer (Shimadzu, Japan). The image of field emission scanning electron microscope (SEM) was taken on an S-4800 (Hitachi, Japan). Powder X-ray diffraction (XRD) patterns were recorded on a powder diffractometer (Bruker D8 Advanced Diffractometer System, Germany) with a Cu Kα (1.5418 Å) source. X-ray photoelectron spectroscopy (XPS) data were recorded on a Thermo Scientific ESCALAB 250 with an Al Kα source (1486.6 eV).
Figure S1. The UV-vis absorption spectrum of 2-Aminoterephthalic Acid (ATA).
Figure S2. Photoluminescence (PL) spectrum of ATA.
**Figure S3.** Fourier transform infrared spectroscopy (FTIR) spectra of ATA before and after oxidase-like catalytic reaction.
Figure S4. The UV-vis absorption spectra of different systems in acetate buffer solution (pH 3.0): a) OPD under light irradiation, b) ATA-OPD under light irradiation. Inset are the corresponding photographs.
Figure S5. Relationship between catalytic activity and ATA concentration.
Figure S6. (A) Steady-state kinetic assays. The nonlinear fitting of Michaelis–Menten curves of ATA with TMB as substrate and (B) corresponding double-reciprocal plot.
Figure S7. Photooxidase-like activity of ATA during repetitive cycles. Activity of 100% is set where absorbance is highest and the relative activities for others are calculated accordingly.
Figure S8. The UV absorption spectra of different system in acetate buffer solution (pH 3.0) with 5 min or 30 s incubation (a-d): a) TMB under visible light irradiation, b) Al-MOF + TMB (no light irradiation), c) Al-MOF + TMB under UV light irradiation, d) Al-MOF + TMB under visible light irradiation, e) ATA + TMB under visible light irradiation. Inset: the closer view of b and c.
Figure S9. XRD pattern of CuCl$_2$·2H$_2$O, ATA before and after incubation with Cu(II) under light exposure.
Figure S10. Selectivity test of Cu$^{2+}$ against Fe$^{2+}$ (50 μM) and Fe$^{3+}$ (12.5 μM) in the absence and presence of masking agent (F$^-$$)$. 
Figure S11. Fluorescence spectrum of the as-prepared Al-ATA
**Figure S12.** Photooxidase-like activity of Al-ATA during repetitive cycles. Activity of 100% is set where absorbance is highest and the relative activities for others are calculated accordingly.
Figure S13. SEM of Al-MOF after catalytic oxidization of TMB.
**Table S1** Kinetics parameters of ATA and HRP with TMB as the substrate.

<table>
<thead>
<tr>
<th>Catalyst</th>
<th>$K_m$ (mM)</th>
<th>$V_{max}$ ($10^{-8}$ M s$^{-1}$)</th>
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<td>HRP</td>
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