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Visible-light-assisted photocatalytic degradation of methylene blue in water by highly chemically stable Cd-CP at room temperature

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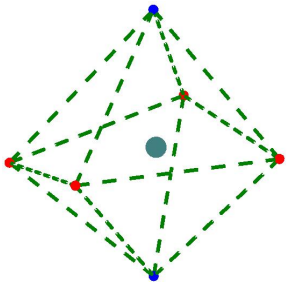

Fig.S1 The distorted octahedral geometry with CdO_4N_2 chromophore of **YAU-10**

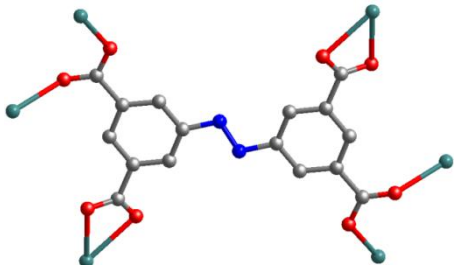

Fig.S2 The coordination mode schematic diagram of H_4dda ligand

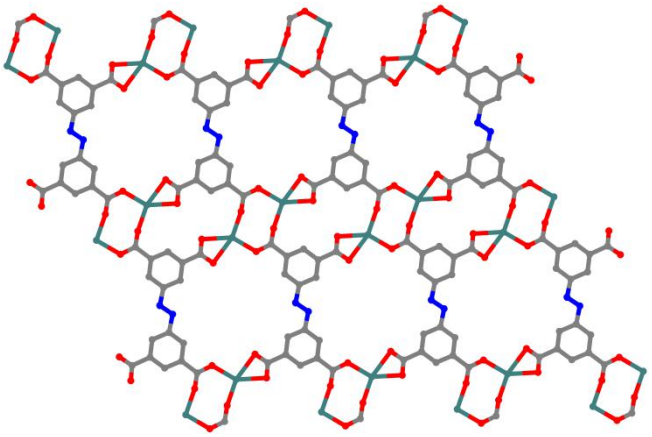

Fig.S3 Perspective view of 2D framework of YAU-10

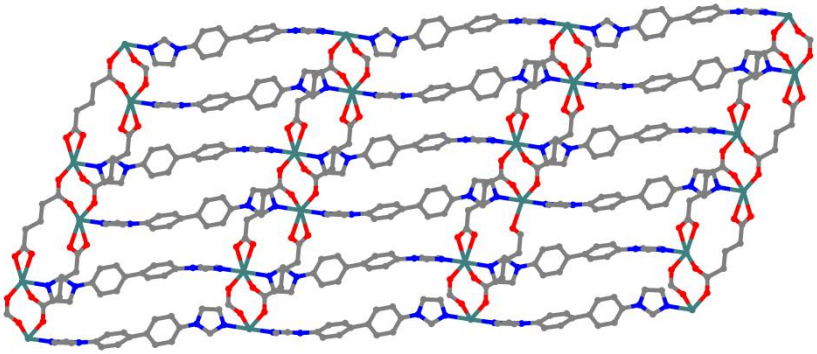

Fig. S4 Perspective view of 1D framework of YAU-10

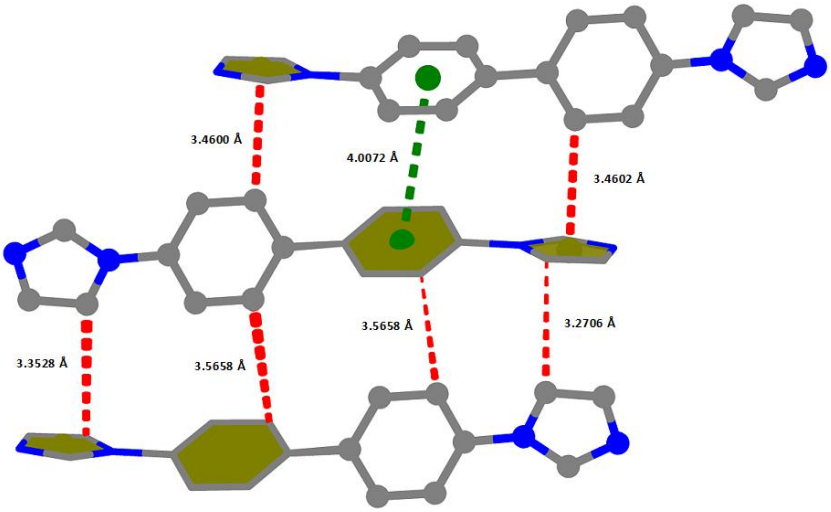

Fig. S5 Theπ-π stacking diagram of YAU-10

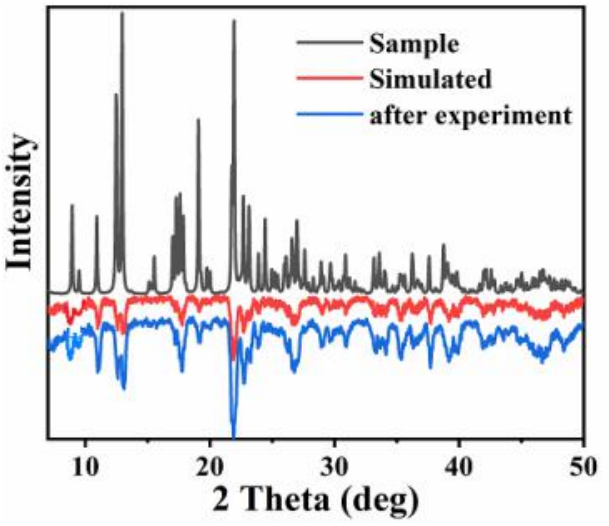

Fig. S6 The PXRD experiments results of YAU-10

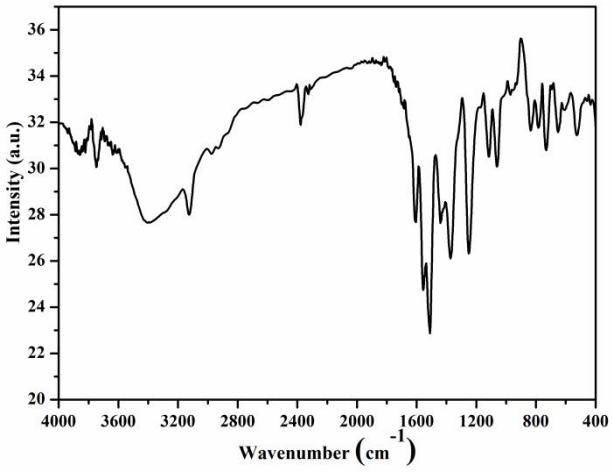

Fig. S7 The infrared spectra of YAU-10

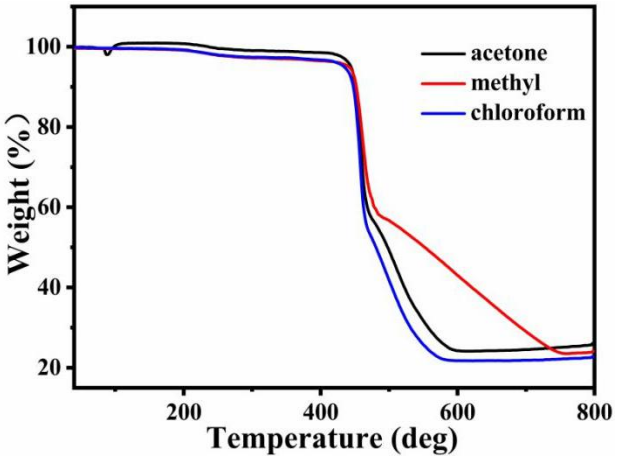

Fig. S8 The TG curves of YAU-10

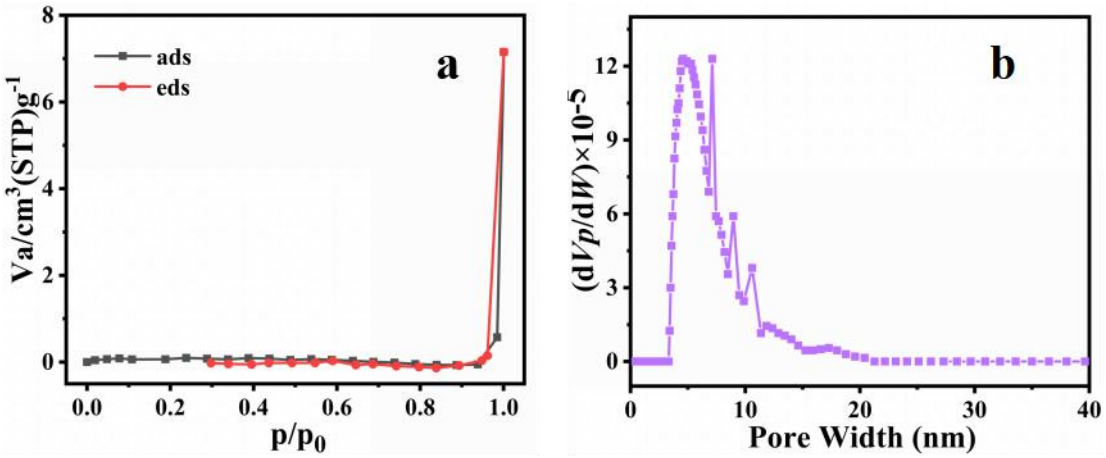

Fig. S9 View of the (a) N_2 adsorption-desorption isotherm; (b) pore diameter distribution curve.

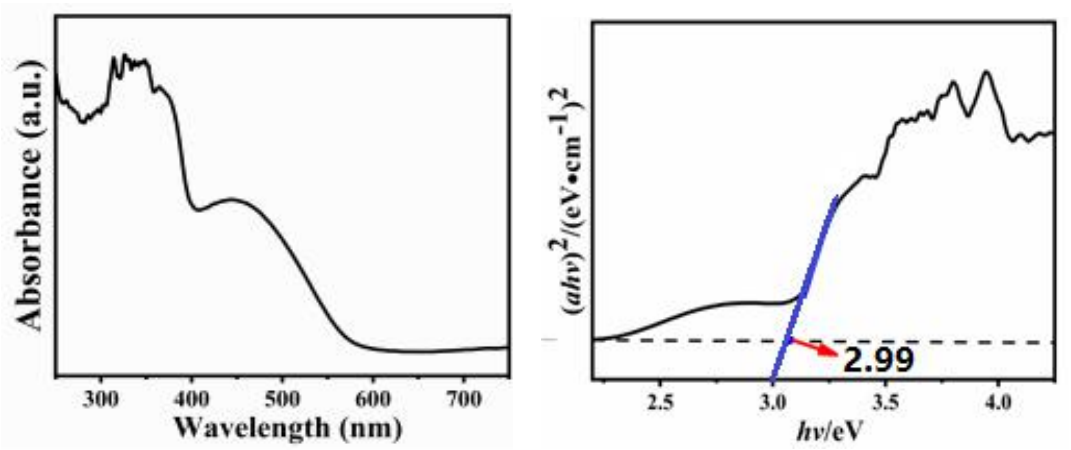

Fig. S10. UV-Vis spectra and Kubelka-Munk formula curve of YAU-10

Table S1 The selected bond distances (Å) and angles (°) for YAU-10

Cd1-O1	2.3273(12)	Cd1-O3#1	2.4918(13)
Cd1-O4#1	2.3580(12)	Cd1-O2#2	2.2834(12)
Cd1-N2	2.2541(15)	Cd1-N5#3	2.2661(16)
O4#1-Cd1-O3#1	54.18(4)	O1-Cd1-O3#1	159.36(5)
O2#2-Cd1-O3#1	91.08(4)	N5#3-Cd1-O3#1	90.65(5)
N2-Cd1-O3#1	96.41(5)	O1-Cd1-O4#1	106.06(5)
N5#3-Cd1-O4#1	93.81(6)	N2-Cd1-O4#1	84.99(5)
O2#2-Cd1-O1	108.70(5)	N5#3-Cd1-O1	84.39(5)
N2-Cd1-O1	86.68(5)	N5#3-Cd1-O2#2	88.01(6)
N2-Cd1-O2#2	98.49(5)	N2-Cd1-N5#3	170.28(6)

Symmetry codes: #1:2-x,2-y,-z; #2:2-x,3-y,-z; #3: 1+x,1+y,-1+z;

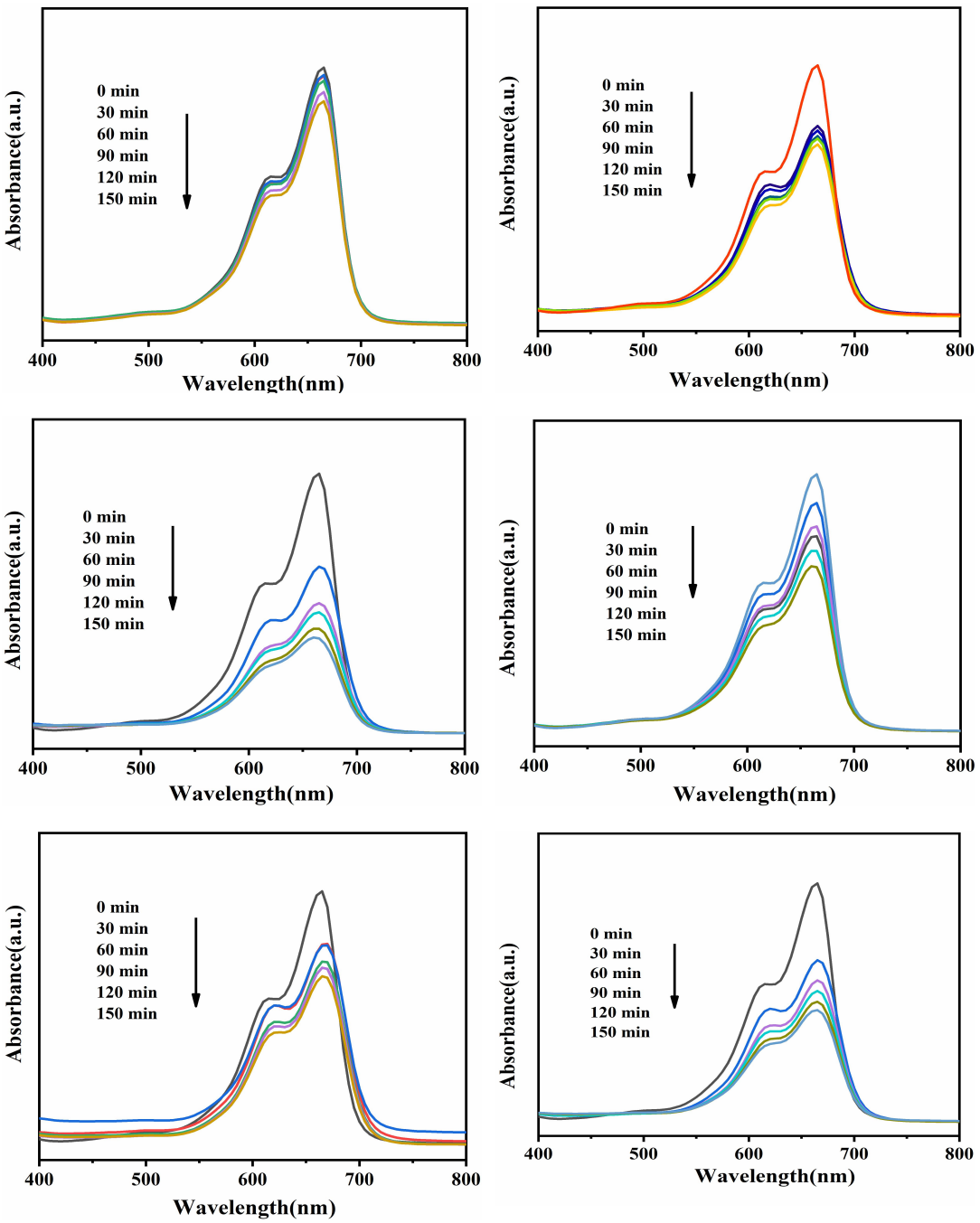

Fig. S11.The experimental results at various conditions screened for photocatalytic degradation of methylene blue.

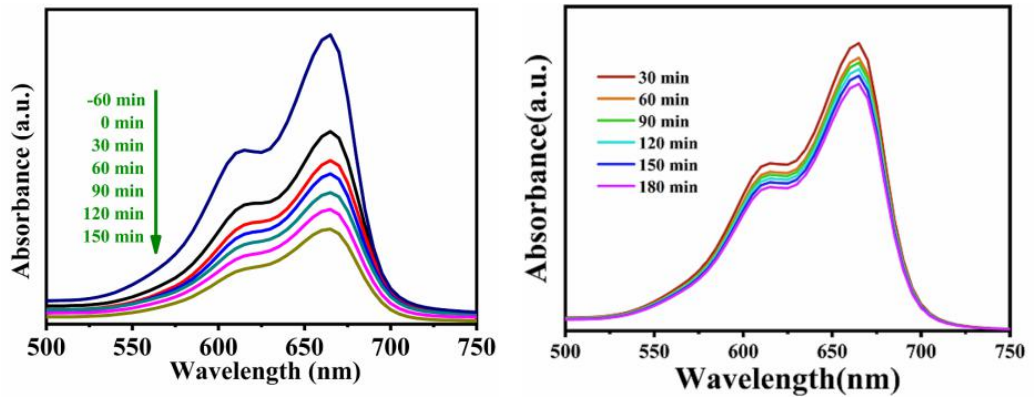

Fig. S12. The degradation of methylene blue in the presence (left) and absence of YAU-10 (right)

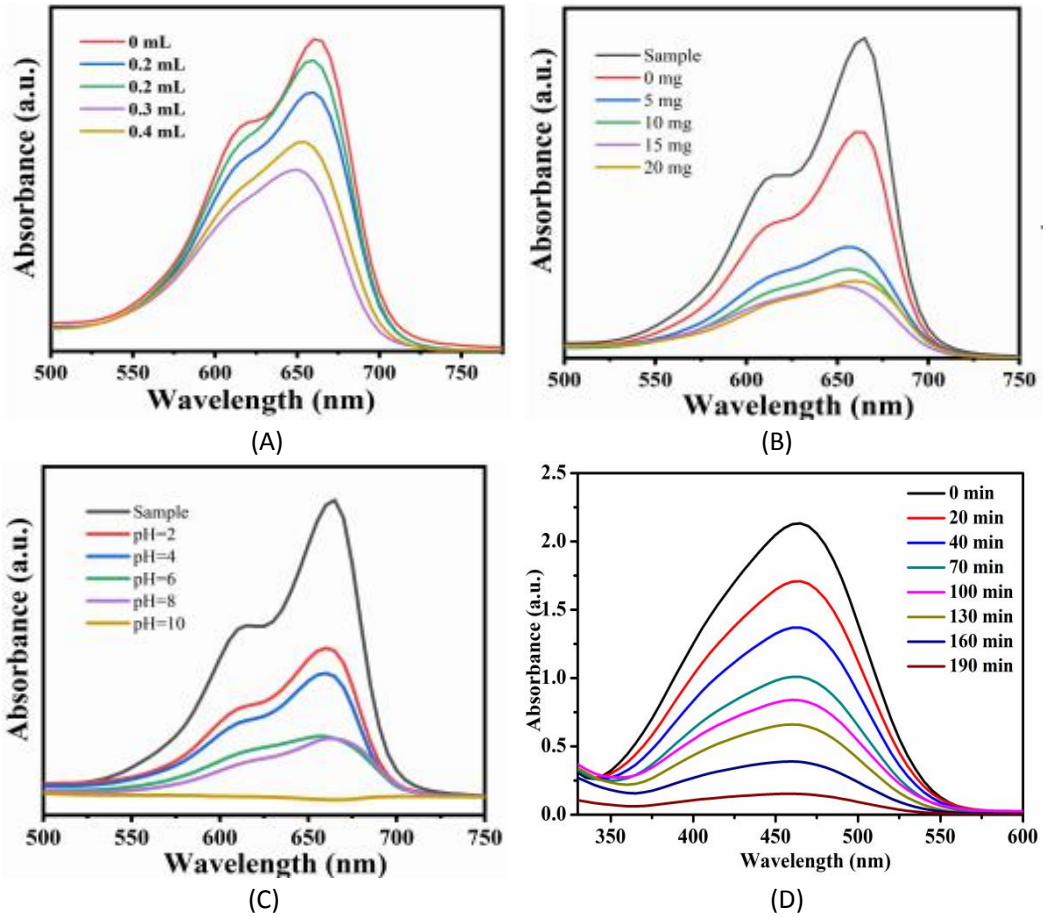

Fig. S13. The optimal condition experimental results of H_2O_2 (A)and YAU-10 (B)dosage and pH value(C); The experimental results YAU-10 photocatalytic degradation of methylene blue in Yan 'he water under optimal conditions (D).

Support information 1.

For each typical photocatalytic degradation reaction, a certain amount of additives (one or more of YAU-10, H_2O_2, HCl/NaOH) were dispersed in 30 mL methylene blue (20 mg/L) solution. During the photocatalytic reaction, the reaction solution was centrifuged every 30 min to obtain the superliquid for absorbance measurement. According to the different additives, each typical photocatalytic degradation experiment can be carried out successively. Detailed experimental methods of methylene blue degradation are described as follows:

(1)30 mL methylene blue solution (20 mg/L) were added to the test tubes (numbered **a,b,c,d,e,f**, respectively).Only 10 mg YAU-10 was added to **a** test tube.10 mg YAU-10 and 0.2 mL H_2O_2(mass fraction of 30%) were added to **b** test tube. **c** test tube only 0.2 mL H_2O_2 was added. 10 mg YAU-10 and 0.2 mL H_2O_2 were added to the **d** test tube.Only 10 mg YAU-10 was added to the **e** test tube. 0.2 mL H_2O_2 to the **f** test tube. Among them, the methylene blue in **a,b** and **c** was photocatalytic degraded under no light. The methylene blue in **d, e** and **f** test tubes was photocatalytic degraded under xenon lamp irradiation. The results were shown in Fig. S11.

(2)30 mL methylene blue solution (20 mg/L) were added to two test tubes. Add YAU-10 to only one of the two tubes.The photocatalytic degraded reaction was carried out under the irradiation of xenon lamp, and the results are shown in Fig. S12.

(3)30 mL methylene blue solution (20 mg/L) and 10 mg YAU-10 were added to the five test tubes, and 0, 0.1, 0.2, 0.3 and 0.4 mL of 30 % H_2O_2 was added in five test tubes, respectively. The photocatalytic degraded reaction was carried out under the irradiation of xenon lamp, and the results are shown in Fig. S13(A).

(4)30 mL methylene blue solution (20 mg/L) and 0.3 mL H_2O_2 (30 %) were added to the five test tubes, and 0, 5, 10, 15 and 20 mg of YAU-10 was added in five test tubes, respectively.The photocatalytic degraded reaction was carried out under the irradiation of xenon lamp, and the results are shown in Fig. S13(B).

(5)30 mL methylene blue solution (20 mg/L), 15 mg YAU-10 and 0.3 mL H_2O_2 (30 %) were added to the five test tubes, and adjust pH values to 2, 4, 6, 8, 10, respectively.The photocatalytic degraded reaction was carried out under the irradiation of xenon lamp, and the results are shown in Fig. S13(C).

(6)The target methylene blue solution was prepared with Yanhe water (Yan'an). 30 mL methylene blue target solution (20 mg/L,), 15 mg YAU-10 and 0.3 mL H_2O_2 (30 %) were added to the test tubes,and adjust pH values =10.The photocatalytic degraded reaction was carried out under the irradiation of xenon lamp, and the results are shown in Fig. S13(D).