

Electronic Supplementary Information (ESI) for

One Highly Photocatalytic Polyoxomolybdate Compound Constructed From Novel-Type Triple Helix $\{\text{Mo}_4\text{O}_{12}\}_n$ Chains and Copper(I)-Organic Nets

Xiutang Zhang,^{*a,b} Liming Fan,^{a,b} Wei Zhang,^a Yuanshuai Ding,^a Weiliu Fan,^b and Xian Zhao^{*b}

^a Advanced Material Institute of Research, College of Chemistry and Chemical Engineering, Qilu

Normal University, Jinan, 250013, China.

E-mail: xiutangzhang@163.com.

^b State Key Laboratory of Crystal Materials, Shandong University, Jinan 250100, China.

E-mail: zhaoxian@icm.sdu.edu.cn.

The procedure about photocatalytic experiments

Due to that the degradation of methylene orange (MO), methylene red (MR), methylene blue (MB), methylene violet (MV), and rhodamine B (RhB) in waste water is difficult, compound **1** was used as a photocatalyst to evaluate its photocatalytic effectiveness. Photocatalytic experiments in aqueous solutions were performed in a 30 mL test tube. A 125 W high-pressure mercury lamp was used as the UV light source. 0.5 mL 30% hydrogen peroxide was injected into 30 min dark adsorption pretreated 15.0 mL 5.0×10^{-5} mol L⁻¹ dyes aqueous solution with 5.0×10^{-3} g of powdered catalyst. At given irradiation time intervals, a series of aqueous solutions of a certain volume were collected and separated through a centrifuge to remove suspended catalyst particles and then subjected to UV-vis spectroscopic measurement. The absorption peaks of MO, MR, MB, MV, and RhB solution decreased obviously under UV irradiation for compound **1**, shown in Fig. S4-S9. The results proved that complex **1** exhibits excellent photocatalytic activities in the degradation of MO, MR, MB, MV, and RhB. In order to investigate the stability of complex **1** as photocatalyst, we repeated the degradation of organic dyes three

times and glad to find they keep similar photocatalytic efficiencies (Figure S9-S13).

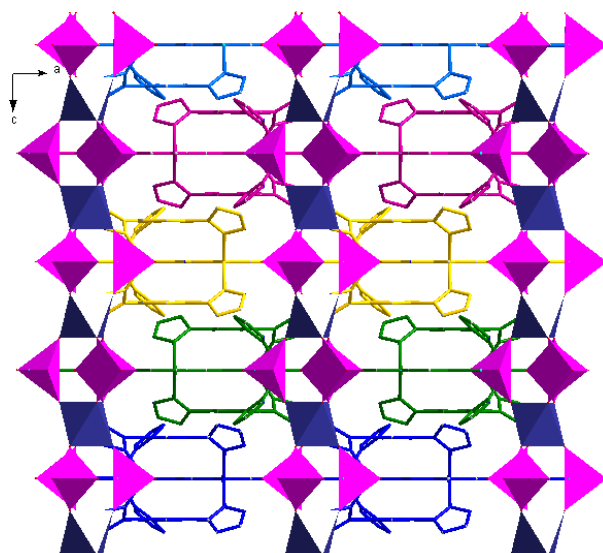


Figure S1. Perspective view of the high-connected 3D network along *ac* plane in **1**. Color scheme: {MoO₄}, pink tetrahedron; {MoO₆}, dark blue octahedra.

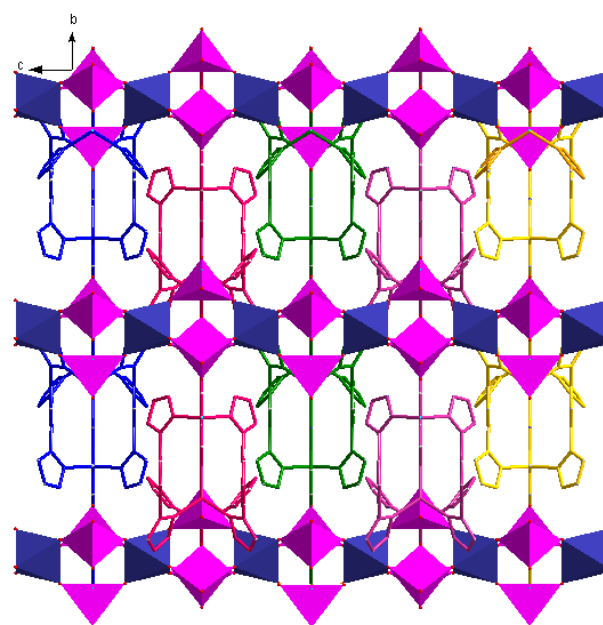


Figure S2. Perspective view of the high-connected 3D network along *bc* plane in **1**. Color scheme: {MoO₄}, pink tetrahedron; {MoO₆}, dark blue octahedra.

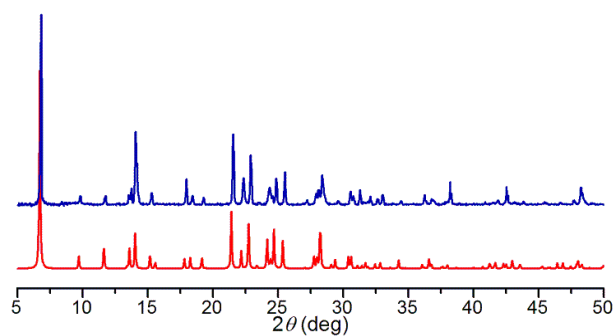


Figure S3. PXRD patterns of **1**. Red: calculated from the X-ray single-crystal data; Blue: observed for the as-synthesized solids.

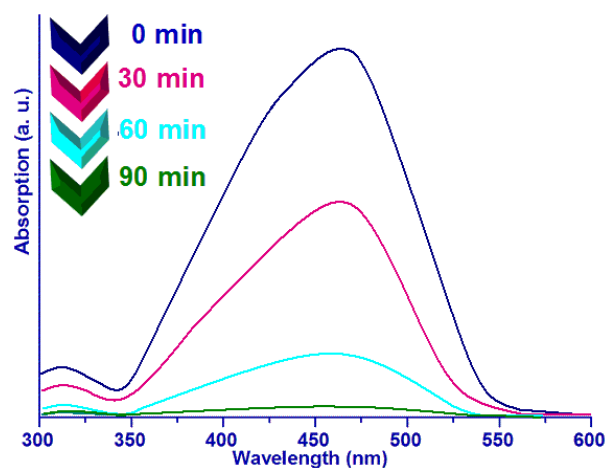


Figure S4. Time dependent UV/Vis spectra of MO over photocatalytic of complex1.

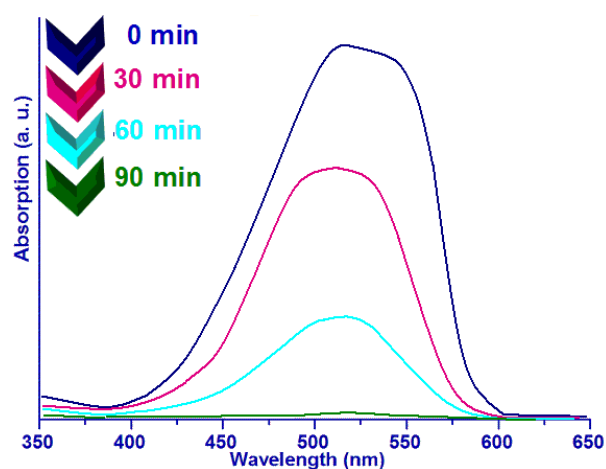


Figure S5. Time dependent UV/Vis spectra of MR over photocatalytic of complex1.

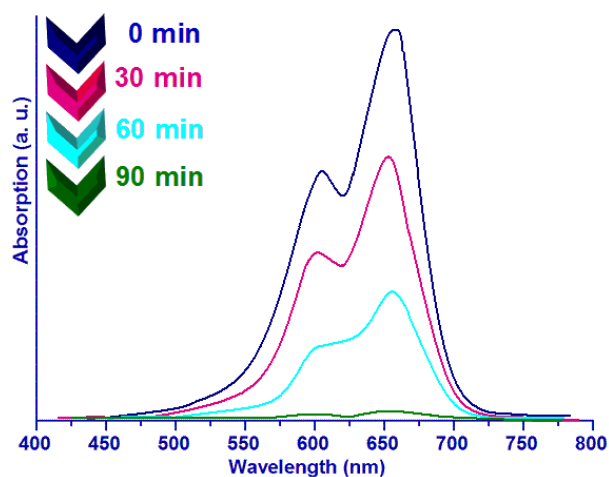


Figure S6. Time dependent UV/Vis spectra of MB over photocatalytic of complex1.

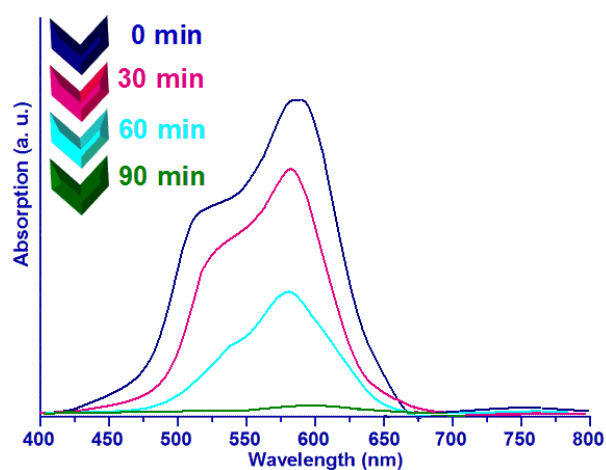


Figure S7. Time dependent UV/Vis spectra of MV over photocatalytic of complex1.

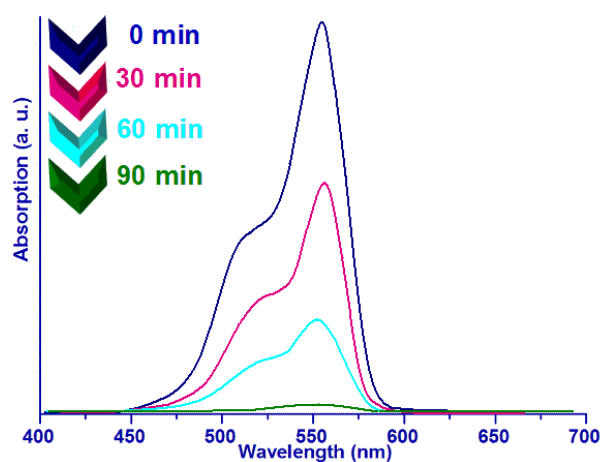


Figure S8. Time dependent UV/Vis spectra of RhB over photocatalytic of complex1.

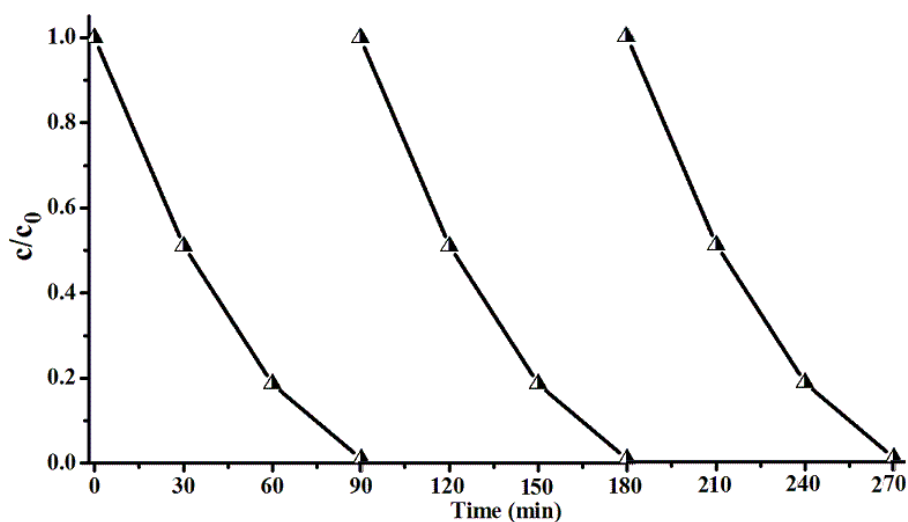


Figure S9. Recycling test on complex 1 for MO photodegradation under fluorescent light irradiation.

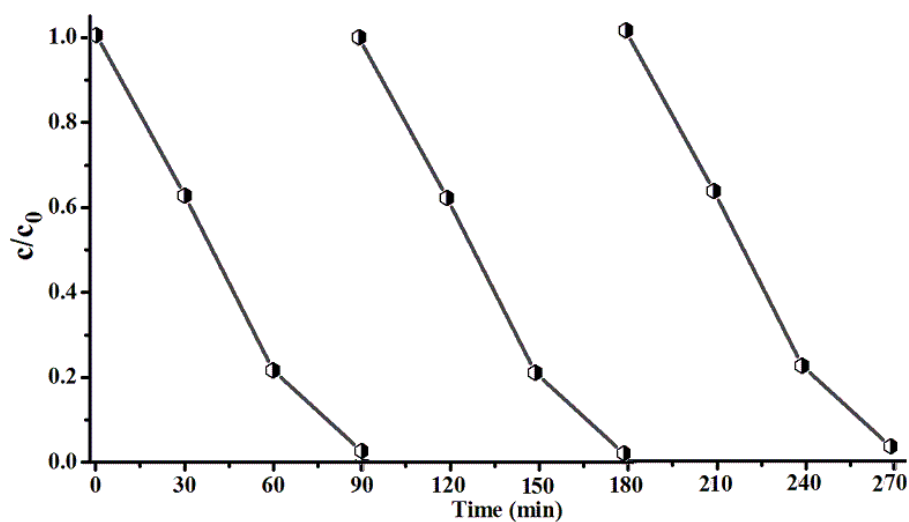


Figure S10. Recycling test on complex 1 for MR photodegradation under fluorescent light irradiation.

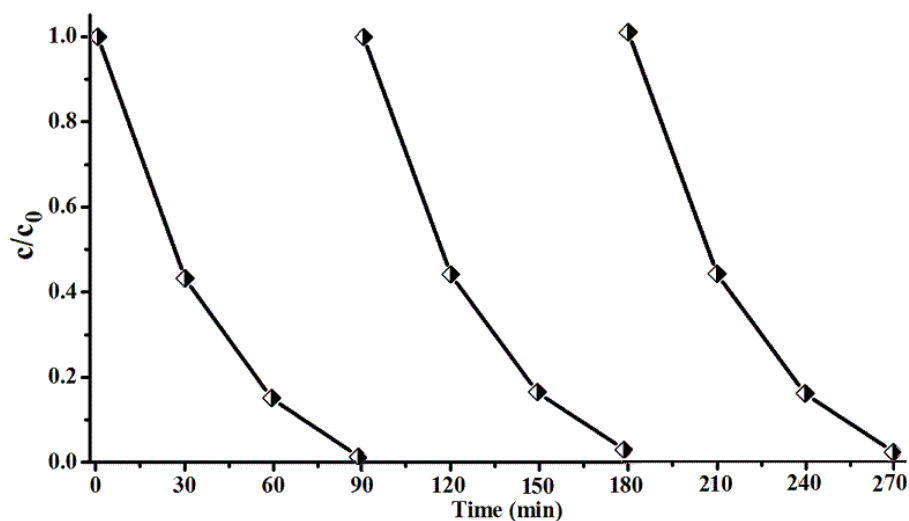


Figure S11. Recycling test on complex 1 for MB photodegradation under fluorescent light irradiation.

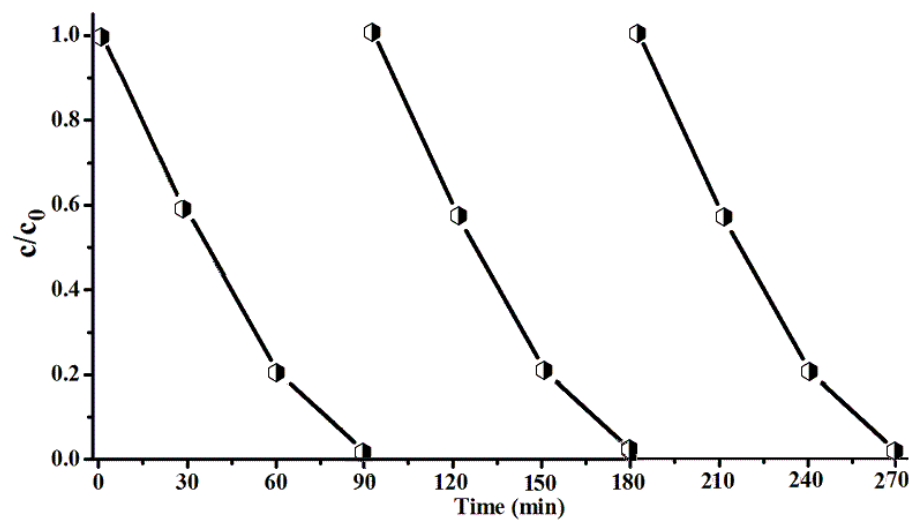


Figure S12. Recycling test on complex 1 for MV photodegradation under fluorescent light irradiation.

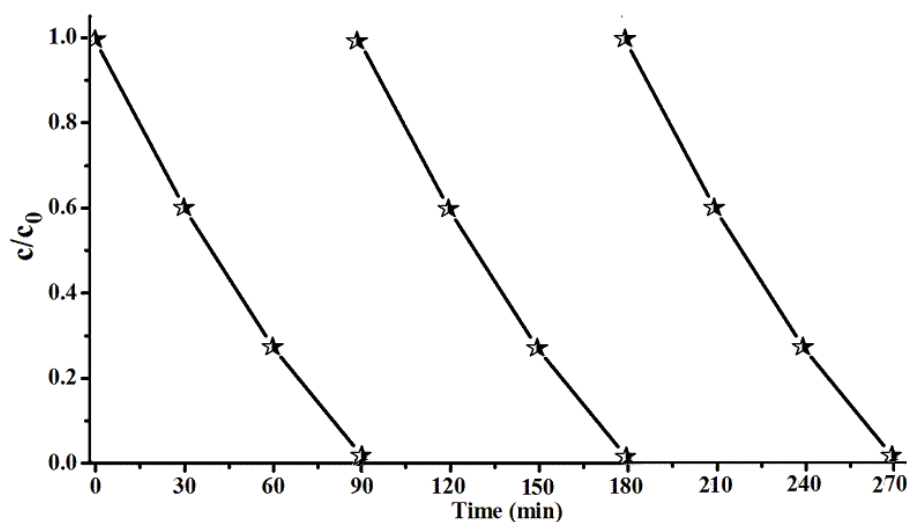


Figure S13. Recycling test on complex 1 for RhB photodegradation under fluorescent light irradiation.

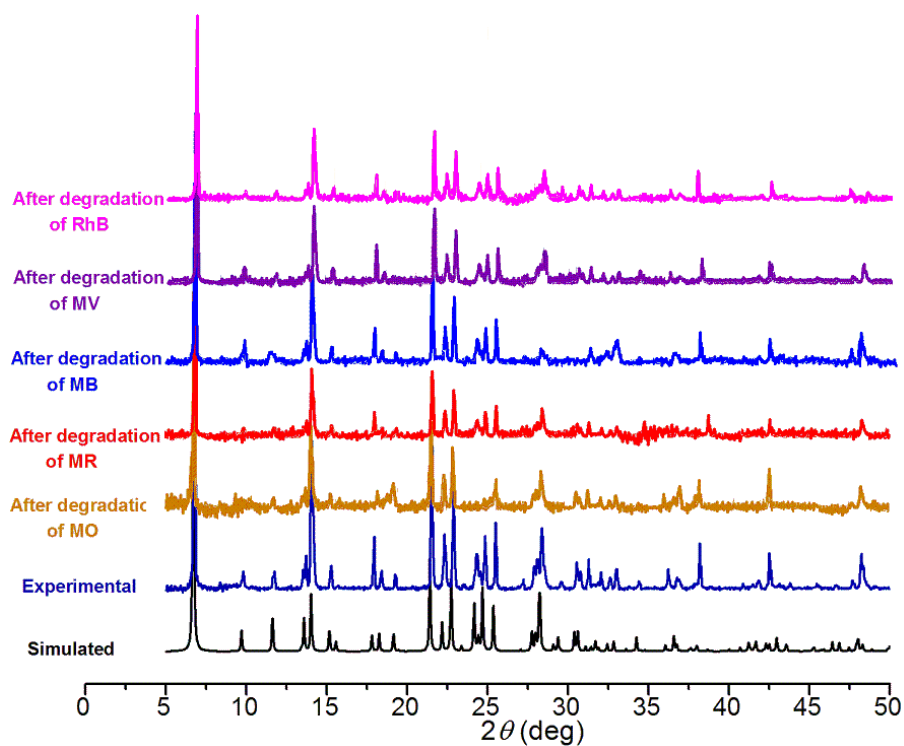


Figure S14. The PXRD patterns of Complex 1 after three cycles photodegradation of five organic dyes. The PXRD traces show diminution in the peaks might be due to the lost of crystallinity.