

Supplemental Material for:

Assembly of 3D hybrids with improved properties by using the transition-metal-monosubstituted Keggin polyoxometalate chains

Chun-Jing Zhang^{†‡}, Hai-Jun Pang[§], Qun Tang[†], and Ya-Guang Chen^{†*}

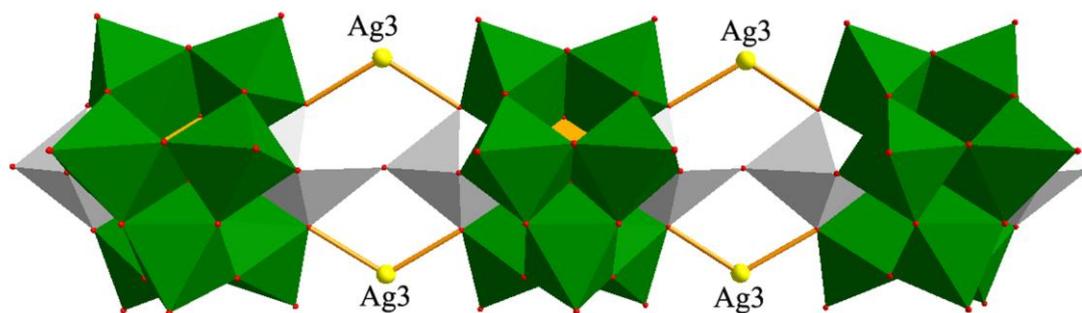
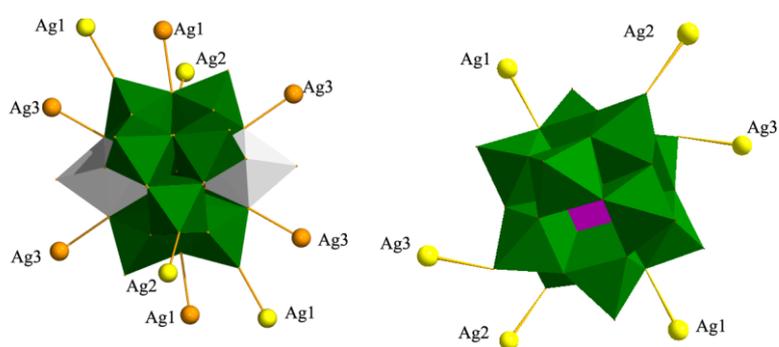
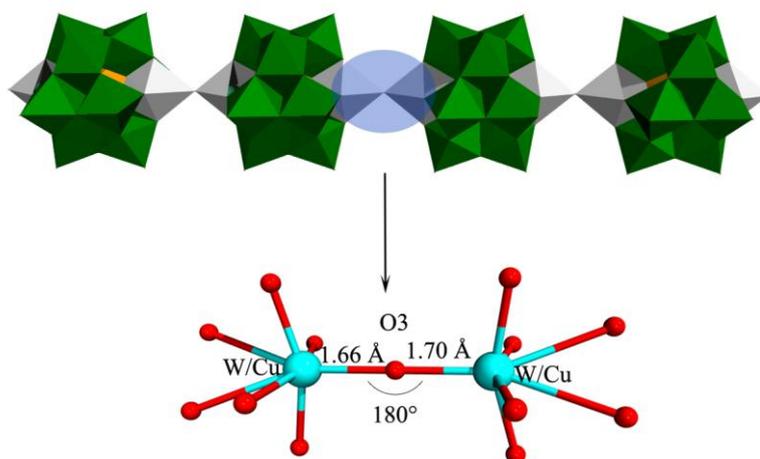
[†]*Key Laboratory of Polyoxometalates Science of Ministry of Education, College of Chemistry, Northeast Normal University, Changchun 130024, P. R. China E-mail: chenyg146@nenu.edu.cn*

[‡]*Heilongjiang University of Chinese Medicine, Harbin 150040, P.R. China*

[§]*College of Chemical and Environmental Engineering, Harbin University of Science and Technology, Harbin, 150080, P. R. China*

Table of the contents:

1. **Fig. S1** Detail view of the Keggin anion-chain in **1**, page S2.
2. **Fig. S2** View of coordination details of POM clusters: (left) $PW_{11}Cu$ in **1** and (right) PW_{12} in **4**, page S2.
3. **Fig. S3** View of connection details between $PW_{11}Cu$ chain and Ag_3 cations in **1**, page S2.
4. **Fig. S4** IR spectra of compounds **1–5**, page S3
5. **Fig. S5** XPS of compounds **4** and **5**, page S3
6. **Fig. S6** The simulative (bottom) and experimental (top) powder X-ray diffraction patterns for **1** and **3–5**, page S4.
7. **Fig. S7** The crystal picture of **2**, page S4.
8. **Fig. S8** The TG curves of compounds **1–5**, page S5.
9. **Fig. S9** The plot of relative concentration (C_t/C_0) of the RhB solution *versus* reaction time: direct photodecolorization (black), photodecolorization in the presence of **1** (blue) and **4** (red), page S5.
10. **Fig. S10** PXRD patterns of **1** (left) and **4** (right): simulative (bottom), experimental (middle) and after the photocatalytic reaction (top), page S5.
11. **Fig. S11** Emission spectrum and absorption spectrum (inset) of btp in the solid state, page S6.



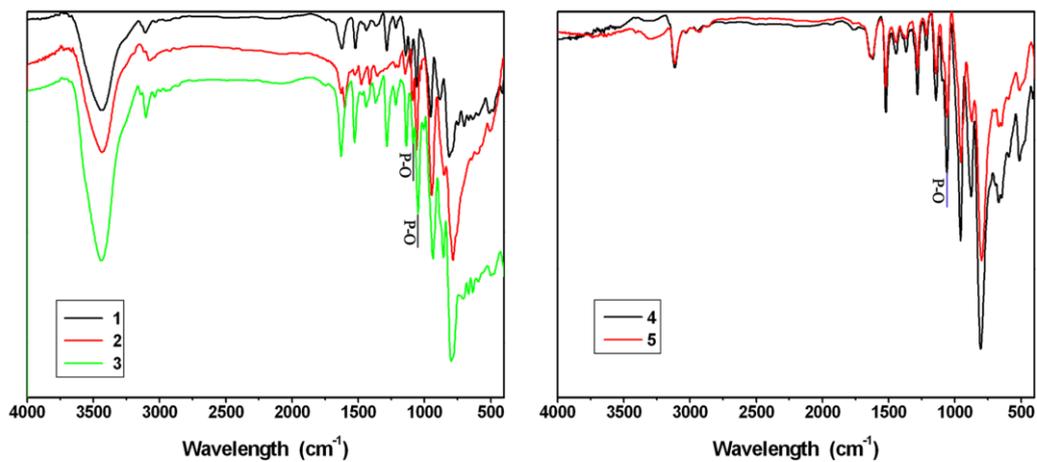


Fig. S4 IR spectra of compounds 1–5.

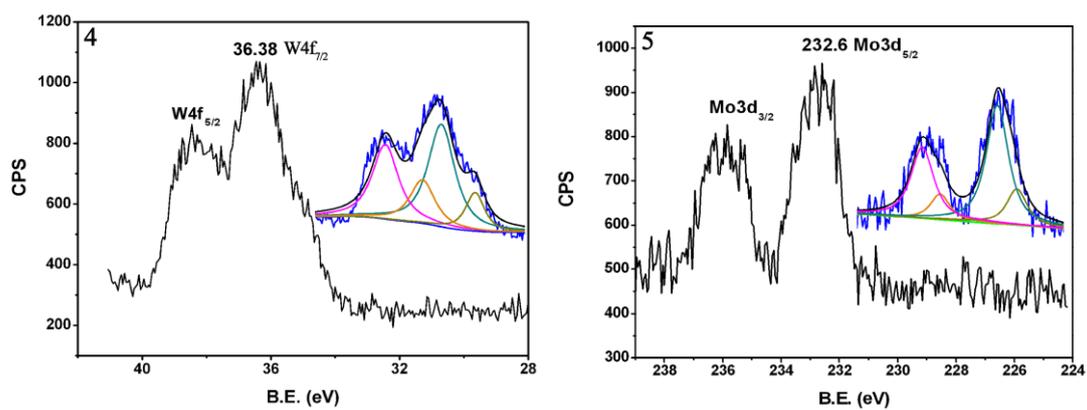


Fig. S5 XPS of compounds 4 and 5.

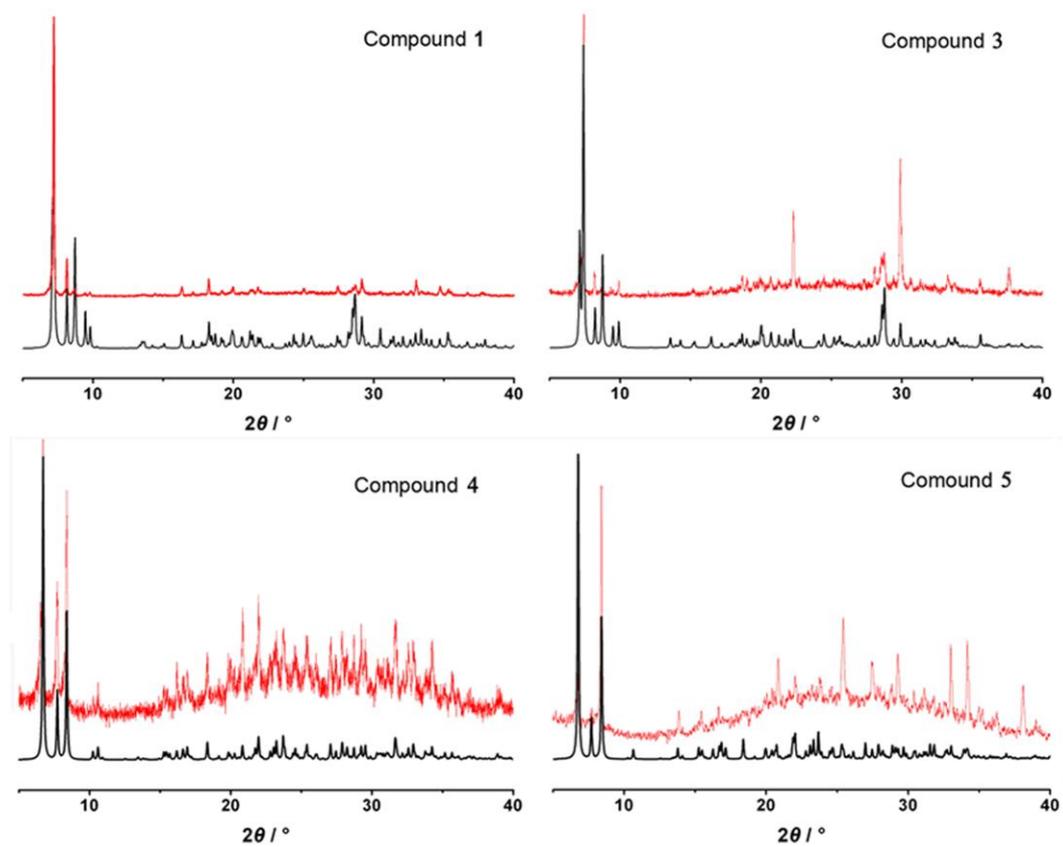


Fig. S6 The simulative (bottom) and experimental (top) powder X-ray diffraction patterns for **1** and **3–5**.

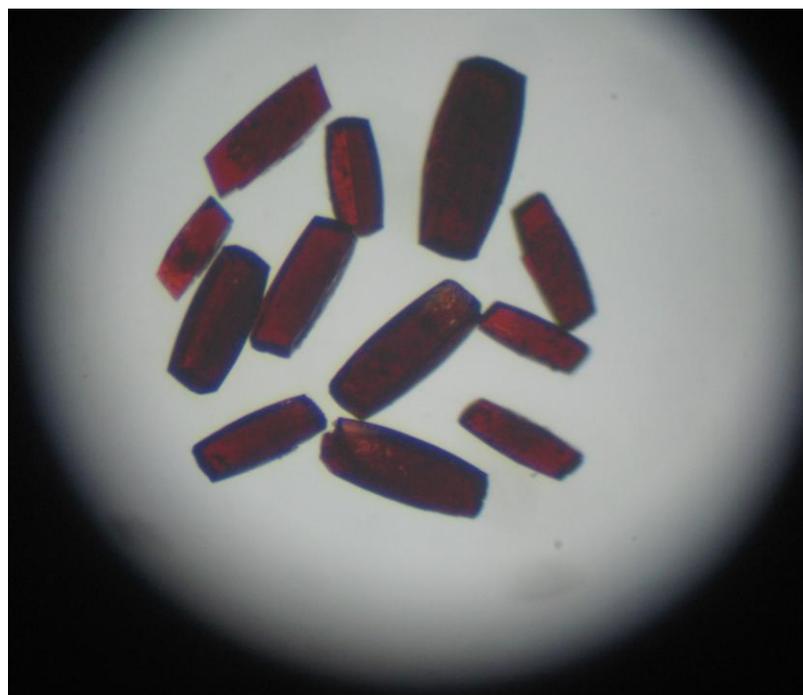


Fig. S7 The crystal picture of **2**.

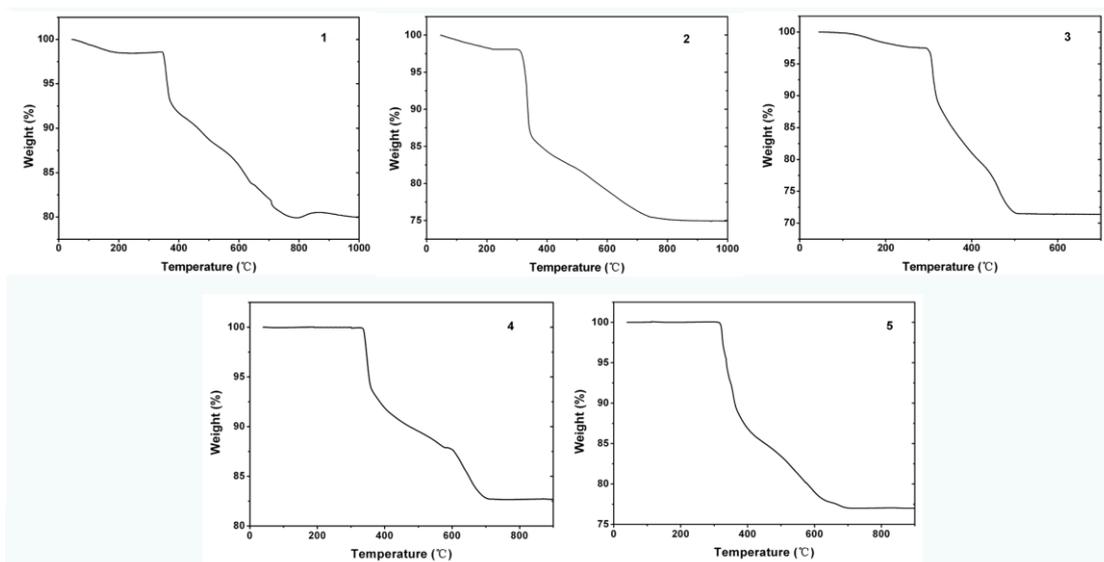


Fig. S8 The TG curves of compounds **1–5**.

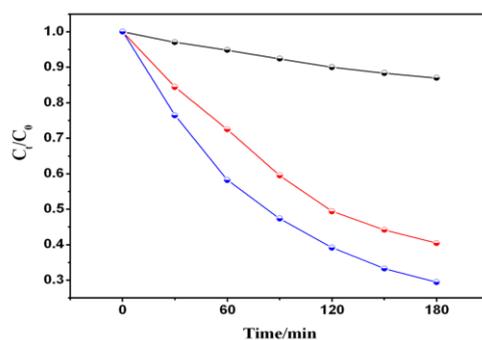


Fig. S9 The plot of relative concentration (C_t/C_0) of the RhB solution *versus* reaction time: direct photodecolorization (black), photodecolorization in the presence of **1** (blue) and **4** (red).

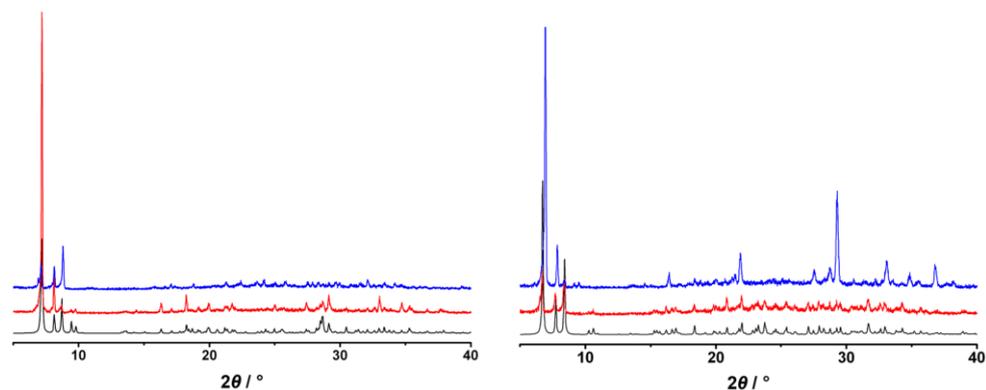


Fig. S10 PXRD patterns of **1** (left) and **4** (right): simulative (bottom), experimental (middle) and after the photocatalytic reaction (top).

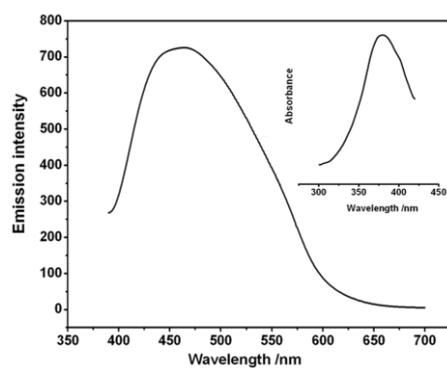


Fig. S11 Emission spectrum and absorption spectrum (inset) of btp in the solid state.