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Fig. s1 IR spectra of compounds 1-5.



Fig. s2 experimental and simulated XRD patterns of compounds 1-5.



Fig. s3 UV-Vis spectra of compounds 1-5.



Fig. s4 cyclic voltammograms of CPEs 1-5.





Fig. s5 photodegradation properties of  $H_4[GeW_{12}O_{40}]$ .



Fig. s6 the simulated and X-ray powder diffraction patterns after three runs of repeated experiments of compound 3.



Fig. s7 Repeated catalytic experiments results of RhB.