

Supporting Information

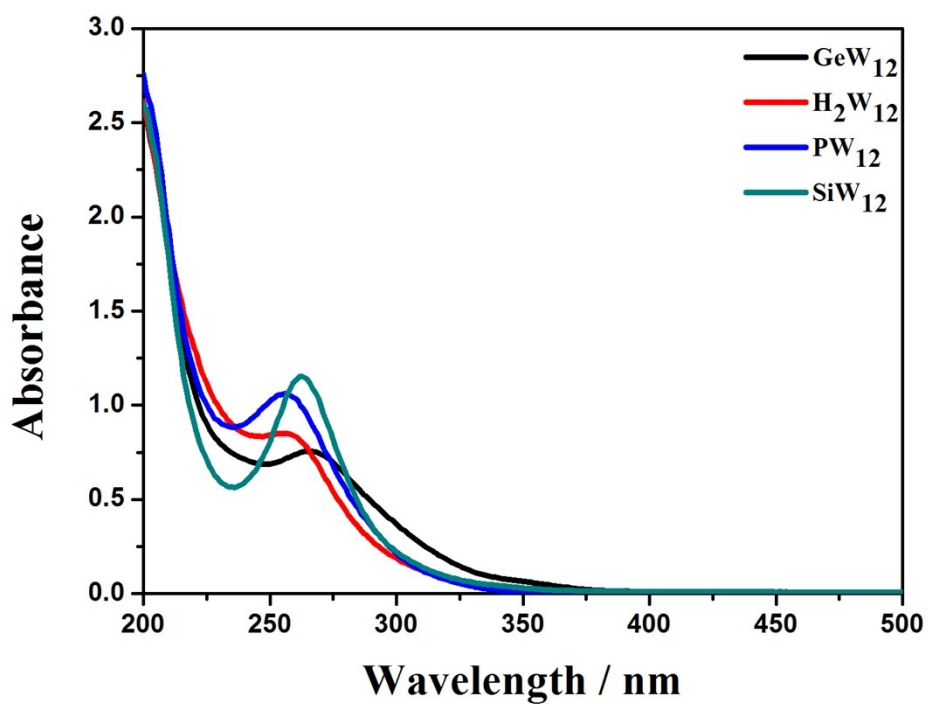


Fig. S1. UV-vis adsorption spectra of four POMs

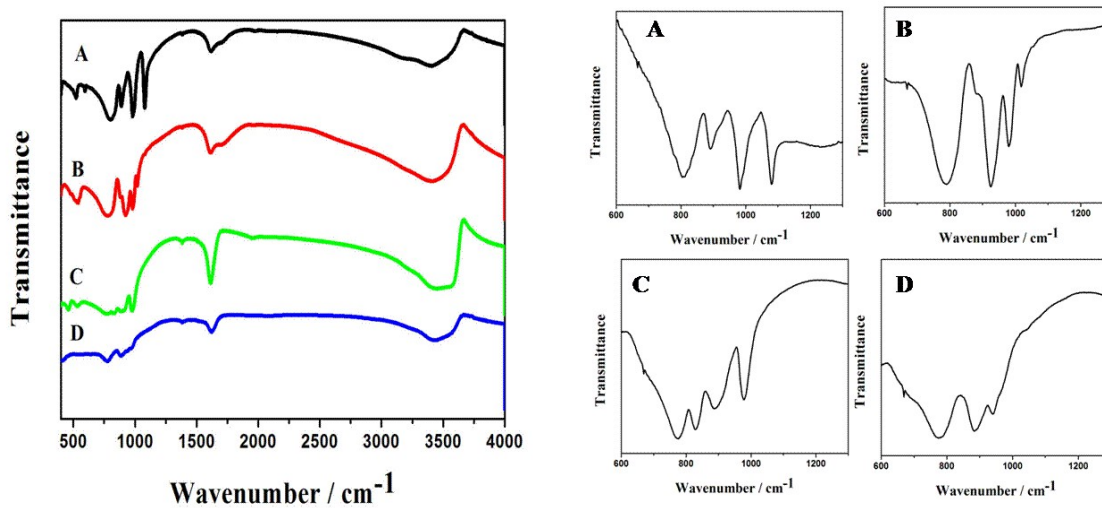


Fig. S2. IR spectra of PW₁₂ (A), SiW₁₂ (B), GeW₁₂ (C) and H₂W₁₂ (D).

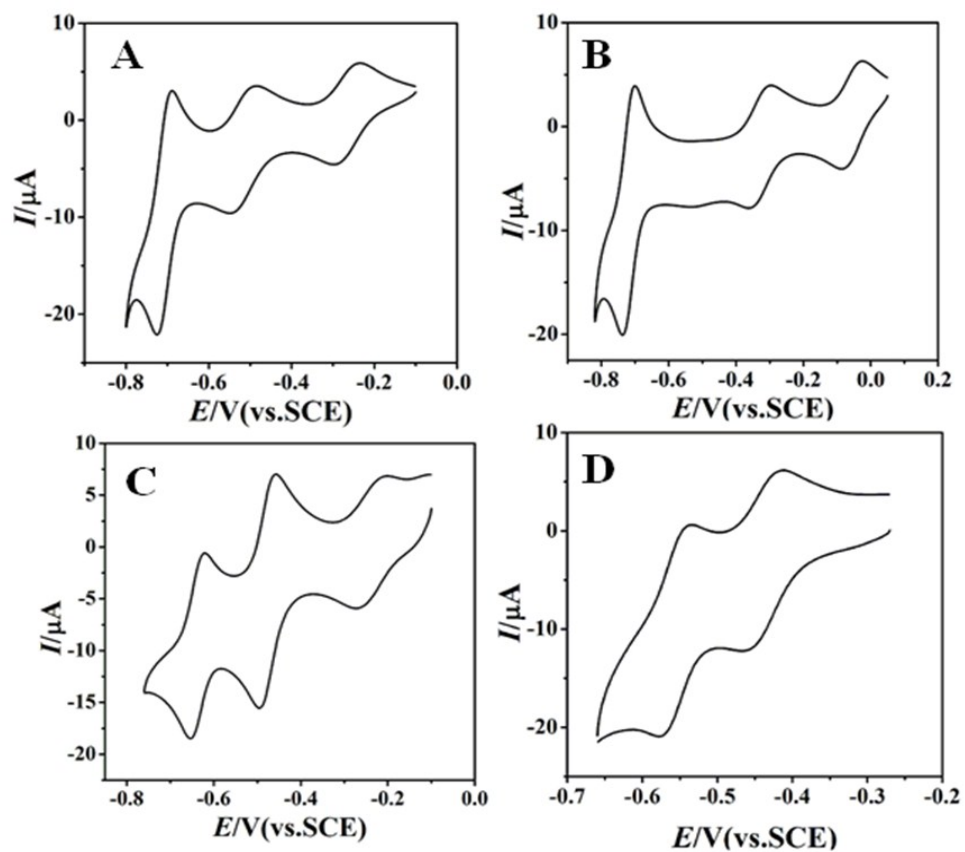


Fig. S3. Cyclic voltammogram of SiW₁₂ (A), PW₁₂ (B), GeW₁₂(C) and H₂W₁₂(D).

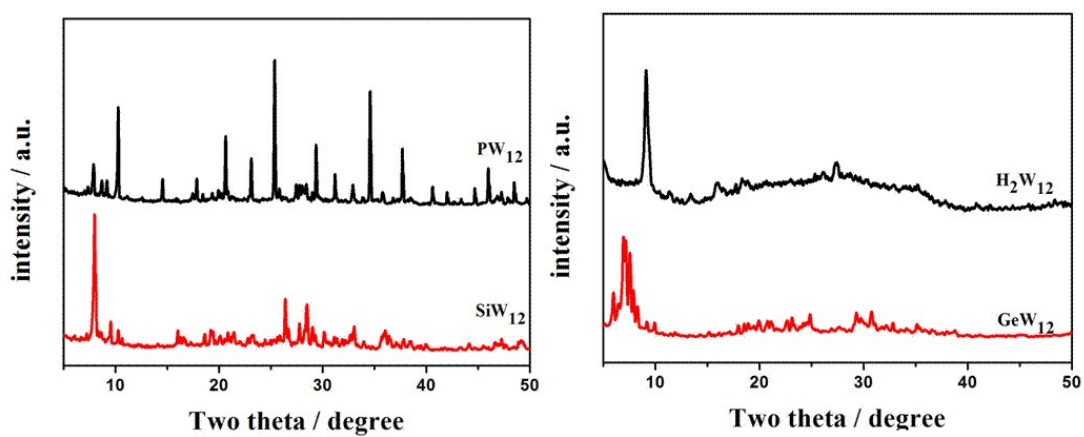


Fig. S4. The XRD patterns of four POMs.

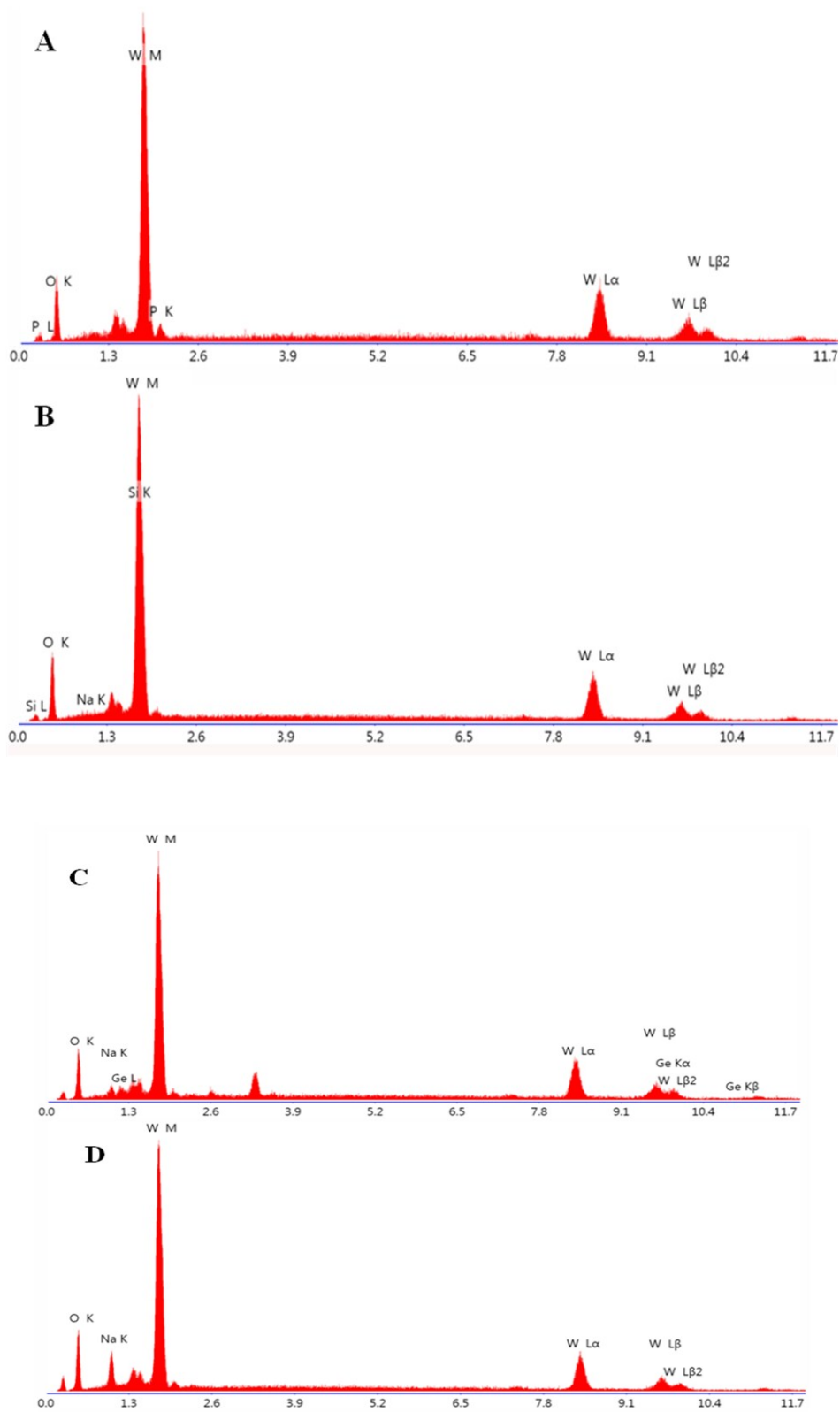


Fig. S5. EDX diagrams of PW₁₂ (A), SiW₁₂ (B), GeW₁₂ (C) and H₂W₁₂(D).

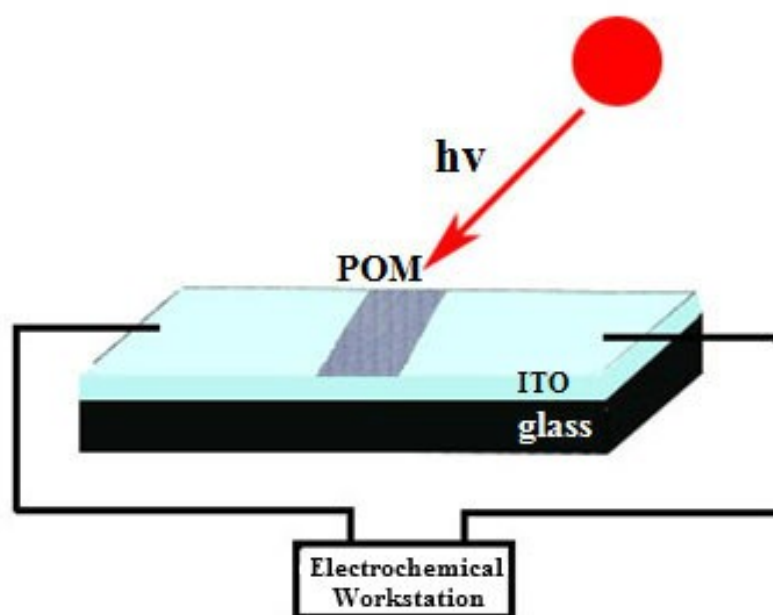


Fig. S6. Schematics of the device structure

Table S1 The E_g values of Keggin-type tungsten-series POMs

POM	PW_{12}	SiW_{12}	GeW_{12}	H_2W_{12}
E_g (eV)	3.32	3.12	2.93	3.14

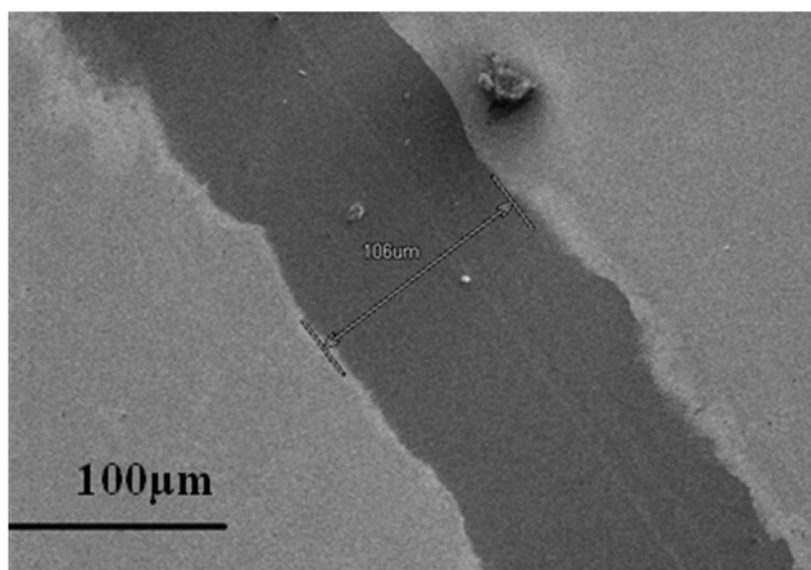


Fig. S7. SEM images of bridging-gap

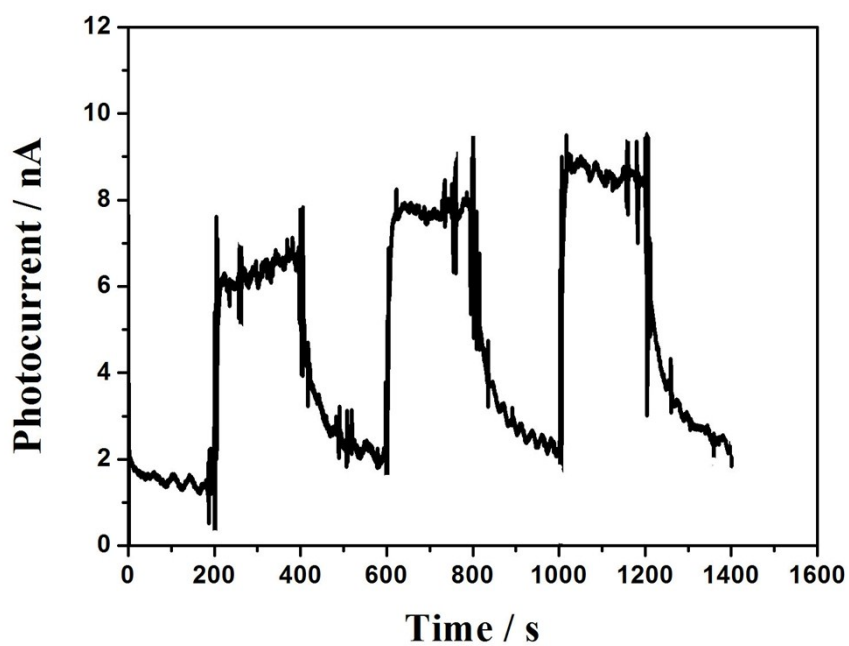


Fig. S8. Photocurrent responses of TiO₂ under Xe lamp irradiation

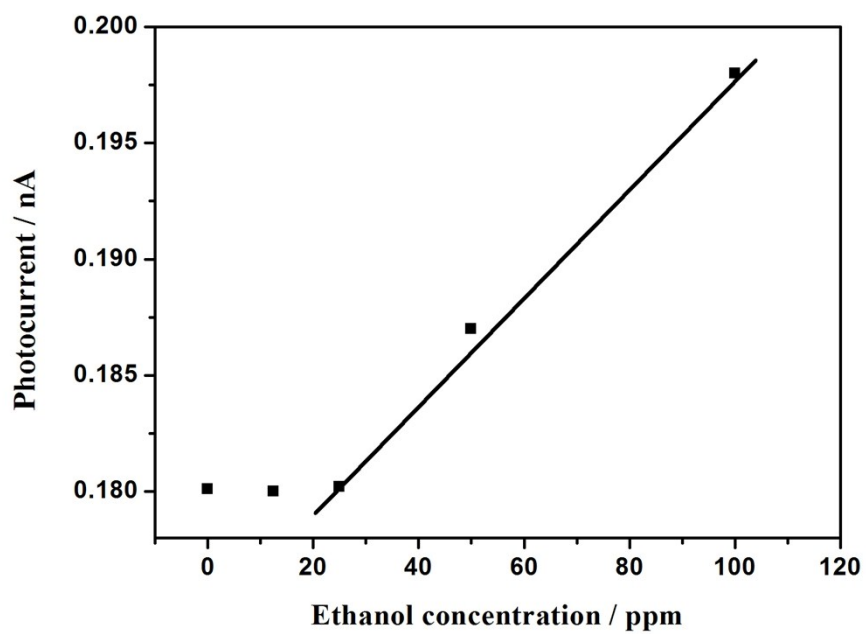


Fig. S9. Photocurrent responses of PW₁₂ device to ethanol concentration (0-100 ppm)