

ELECTRONIC SUPPORTING INFORMATION

Effective catalytic heterogeneous zinc-substituted polyoxometalate for oxidation reactions and desulfurization processes

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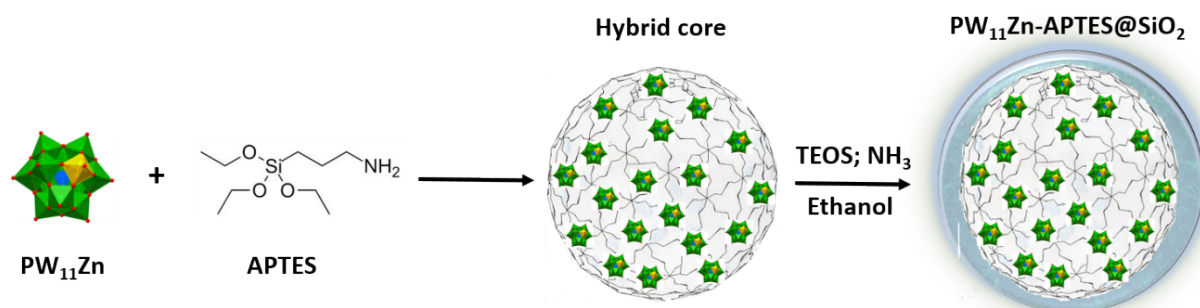


Figure S1. Schematic representation for the preparation of the $\text{PW}_{11}\text{Zn-APTES@SiO}_2$ composite.

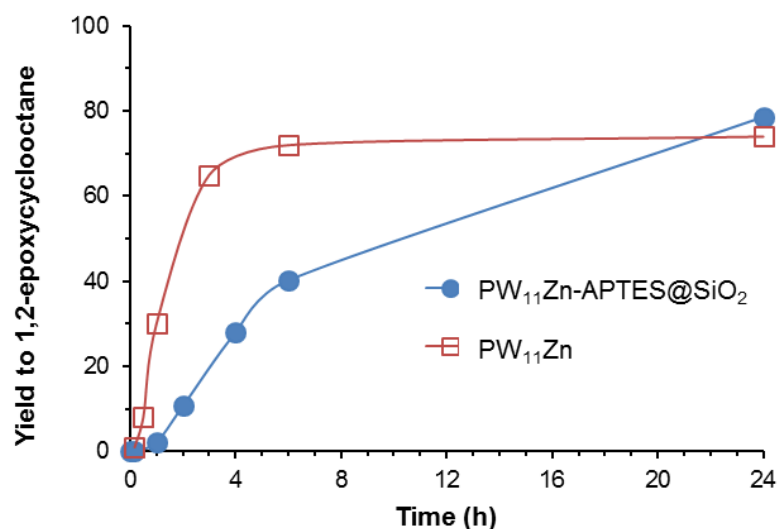


Figure S2. Comparison of kinetic profile for cyclooctene oxidation, catalyzed by the homogeneous PW₁₁Zn catalyst (open symbols) and heterogeneous composite catalyst (solid symbols), using H₂O₂ as oxidant and MeCN as solvent.

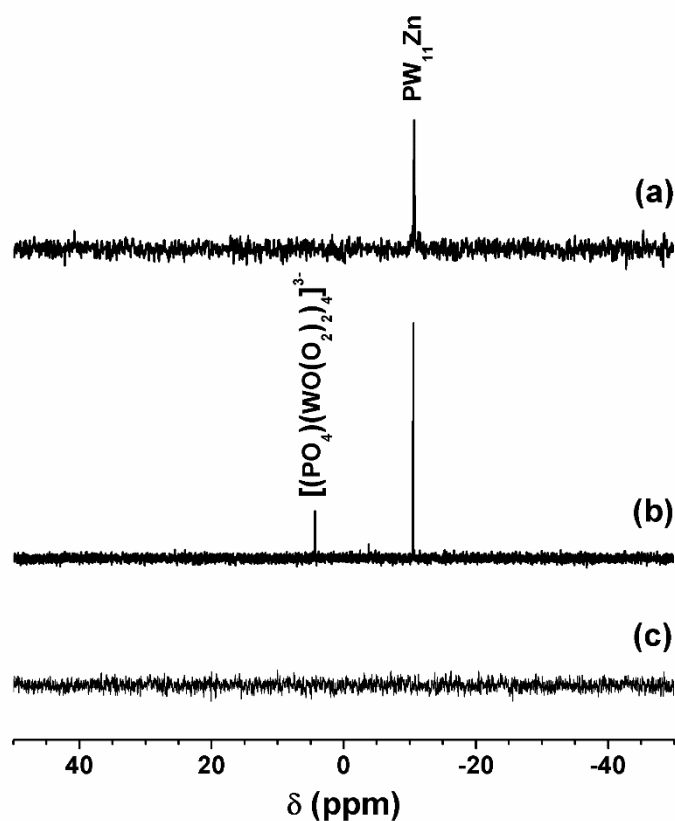


Figure S3. ³¹P NMR spectra of (a) TBA salt of PW₁₁Zn in CD₃CN, (b) liquid phase homogeneous catalysis using TBA salt of PW₁₁Zn for cyclooctene oxidation in the presence of H₂O₂, and (c) reaction medium of the ODS heterogeneous catalysis with PW₁₁Zn-APTES@SiO₂ upon filtering.

