Supporting Information

Impact of Titanium in Controlling Silver Particle Size on Enhancement of Catalytic Performance of AgMoO₃/Ti-HMS for Direct Epoxidation of Propylene

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Figure S1. Nitrogen adsorption-desorption Isotherms of (a) Ti-HMSi $_5$ and (b) Ti-HMSi $_{20}$ supports.



Figure S2. X-ray diffraction patterns of silver supported on Ti-HMS_n. Peaks marked by the symbols "o", "*", " \diamond ", " Δ " assigned to MoO₃, AgO, Ag₂O and Ag, respectively.



Figure S3. X-ray diffraction patterns of NaCl modified -AgMo/Ti-HMS_n Peaks marked by the symbols "o", "*", " \diamond ", " Δ " assigned to MoO₃, AgO, Ag₂O and Ag, respectively.



Figure S4. Small-angle XRD pattern of Ti-HMS₁₀ support



Figure S5. Dependence of $\log \Delta \Gamma_0^-$ (amount of acid) and $\log \Delta \Gamma_H^+$ (amount of base) on pH for pure Ti-HMSn.



Figure S6. Dependence of $log\Delta\Gamma_{O}^{-}$ (amount of acid) and $log\Delta\Gamma_{H}^{+}$ (amount of base) on pH for 20 wt%Ag – 4 wt%MoO₃ supported on different Ti-HMS_n supports



Figure S7. Dependence of $log\Delta\Gamma_{O}^{-}$ (amount of acid) and $log\Delta\Gamma_{H}^{+}$ (amount of base) on pH for NaCl. modified 20 wt% Ag -4%MoO₃ supported on different Ti-HMS_n supports and modified with 2wt%NaCl.



Figure S8. FT-IR spectra of Ti-HMS $_n$ samples of Si/Ti molar ratios from 5 to 40.



Figure S9. FT-IR spectra of titanium containing hexagonal mesoporous silicas (Ti-HMS_n, n = 10 and 40) supported silver and silver- molybdenum catalysts.



Figure S10. Diffuse-reflectance UV-vis spectra of Ti-HMS samples of Si/Ti molar ratios 5, 10, 20 and 40.





Figure S11: Histograms of particle size distribution from HRTEM micrographs of the catalysts: (a) Ag/Ti-HMSi₄₀; (b) Ag/Ti-HMSi₁₀



Figure S12. TEM image of Ag/Ti-HMS $_{10}$ at high magnification



Lsec: 655.4 0 Cnts 0.000 keV Det: Octane Pro Det Reso

Element	Weight %	Atomic %	Net Int.	Net Int. Error
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SiK	66.81	83.37	901.3	0
MoL	3.3	1.21	12.4	0.04
AgL	15.85	5.15	66.1	0.01
TiK	14.04	10.27	81.8	0.01

Figure S13. EDX spectra of AgMo/Ti-HMS₁₀



Figure S14. Raman spectra of (a) Ti-HMS $_{40,}$ (b) Ti-HMS $_{20,}$ (c) Ti-HMS $_{10,}$ and (d) Ti-HMS $_5$ supports collected at 25°C