Electronic Supplementary Information (ESI) for

A size-matched POM@MOF composite catalyst for highly efficient and recyclable ultra-deep oxidative fuel desulfurization

Yun-Lei Peng,[‡,a] Jingyi Liu, [‡,a] Hai-Feng Zhang,[a] Dong Luo,[b] Dan Li [*,b]

[a] Department of Chemistry, Shantou University, Guangdong 515063, P. R. China

[b] College of Chemistry and Materials Science, Jinan University, Guangzhou 510632, P. R. China.

Email: *danli@jnu.edu.cn*

‡ The authors equally contributed to the work.

Characterization methods

All reagents and solvents employed were commercially available and used as received without further purification. Fourier transform Infrared spectra (FT-IR) were obtained in KBr disks on a Nicolet Avatar 360 FT-IR spectrometer in the range of 4000-400 cm^{-1}. Elemental analyses (C, H, N) was performed using a Vario EL III CHNS elemental analyzer. Thermogravimetric analysis (TGA) was performed on TA Instruments Q50. Thermogravimetric Analyzer was performed under nitrogen flow of (40 mL min^{-1}) at a typical heating rate of 10 °C min^{-1}. Powder X-ray diffraction (PXRD) experiments were performed on a D8 Advance X-ray diffractometer with Cu Kα radiation (λ = 1.5418 Å). High Performance Liquid Chromatography (HPLC) experiments were performed on Agilent Technologies 1100 with a Hypersil ODS column. Atomic absorption spectroscopy (AAS) was performed on Solaar M6 MK2 equipment. Scanning electron microscopy (SEM) and energy dispersive spectroscopy (EDS) analysis were carried out on the S-4800 Field Emission Scanning Electron Microscope (Hitachi, Japan).

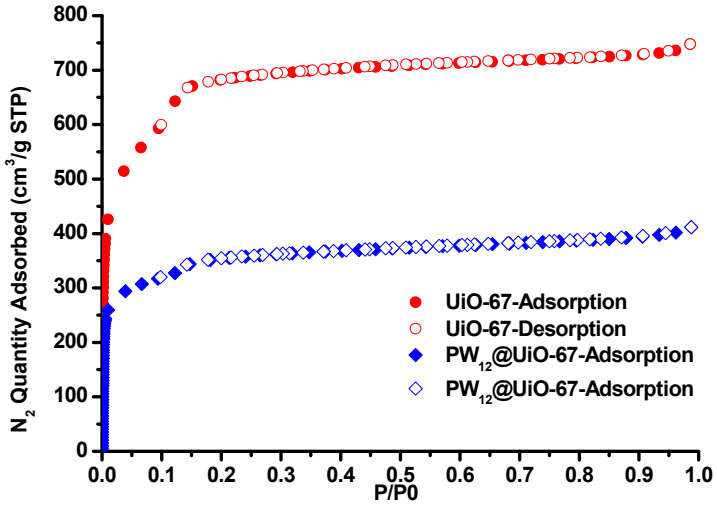

Fig. S1 N_2 adsorption/desorption isotherms of UiO-67 and PW_{12}@UiO-67.

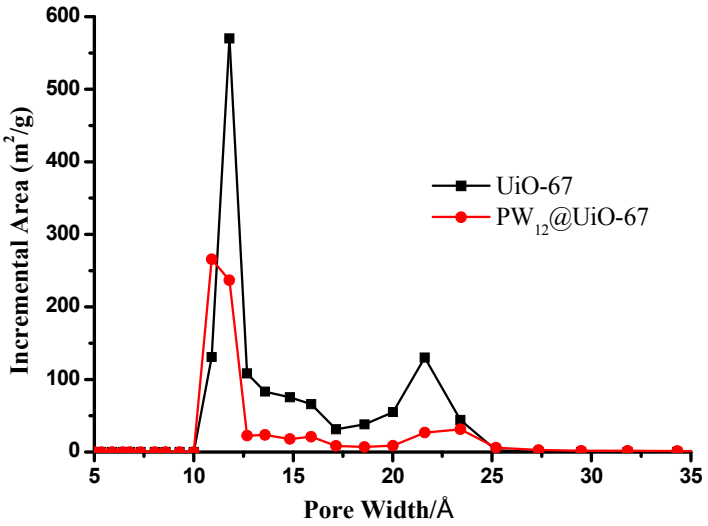

Fig. S2 Density functional theory pore size distribution (PSD) profiles of UiO-67 and PW_{12}@UiO-67.

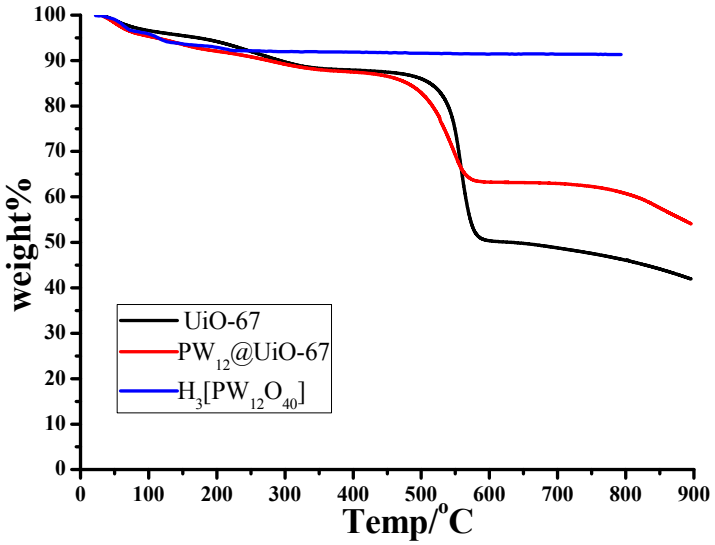

Fig. S3 TGA plots of $H_3PW_{12}O_{40}$, UiO-67 and PW_{12}@UiO-67.

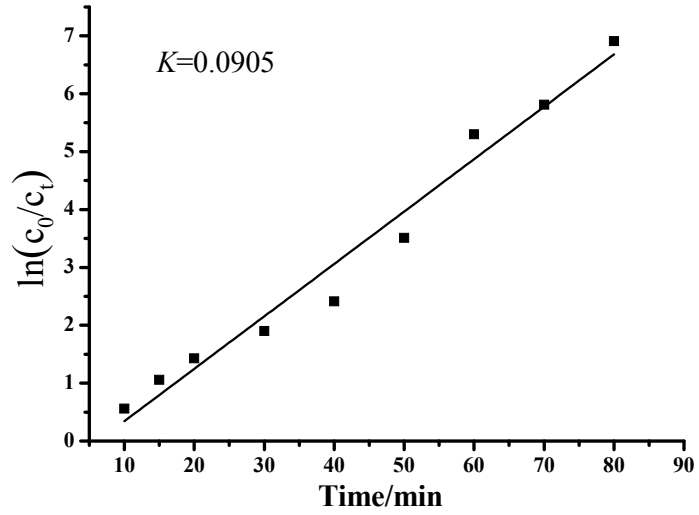

Fig. S4 Pseudo-first-order kinetic plot for the oxidation of DBT catalyzed by PW_{12}@UiO-67 (reaction condition: 70 °C; O/S = 13).

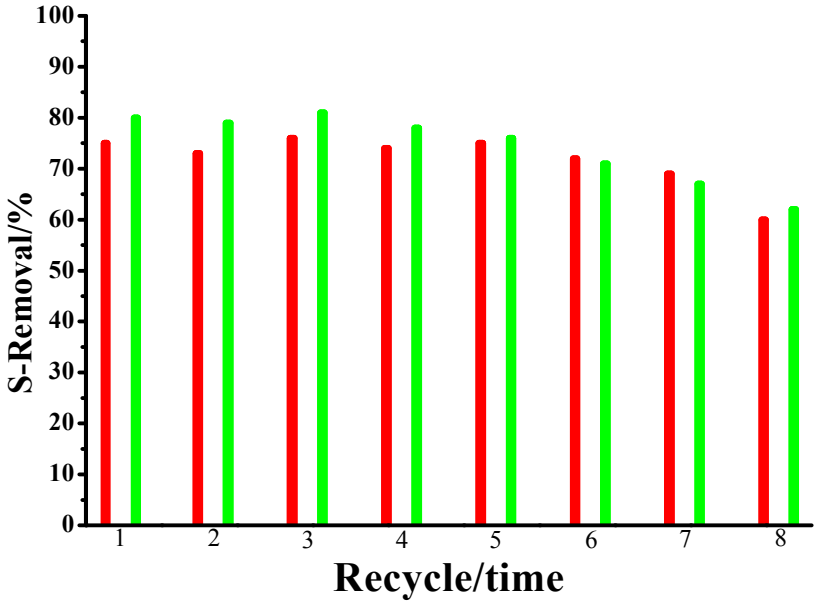

Fig. S5 Removal rate of DBT (red) and 4, 6-DMDBT (green) among 8 consecutive catalytic reactions.

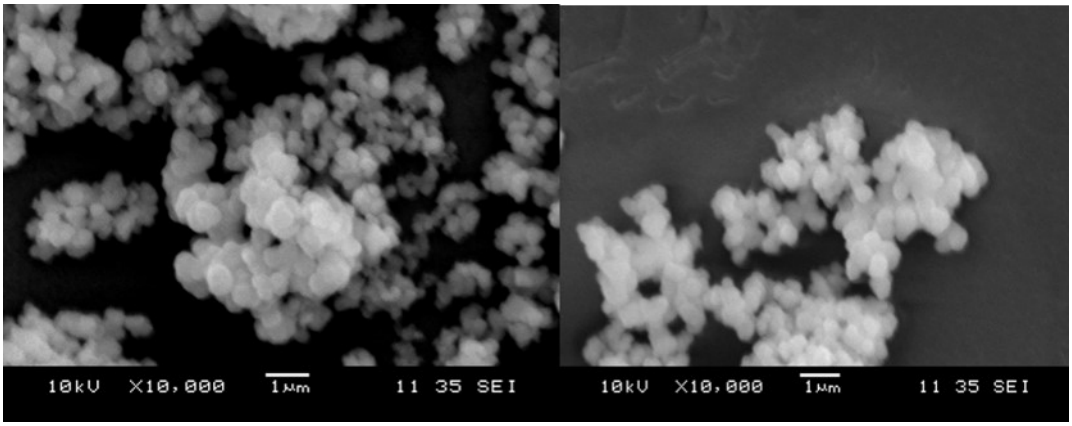

Fig. S6 SEM images of UiO-67 (left) and PW_{12}@UiO-67 (right).