Supplementary Information
of

A novel MOF-808 derived material for oxidative desulfurization: the synergistic effect of hydrophobicity and electron transfer

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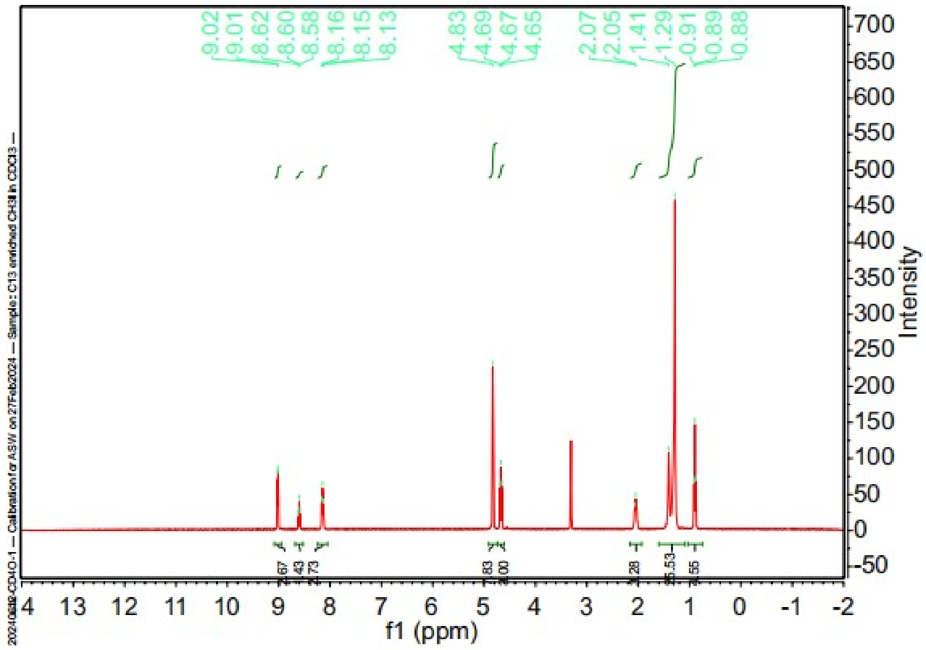

Figure S1. ^{1}H NMR spectrum of $[C_{12}Py]_3(NH_4)_3Mo_7O_{24}$ in CD_4O.

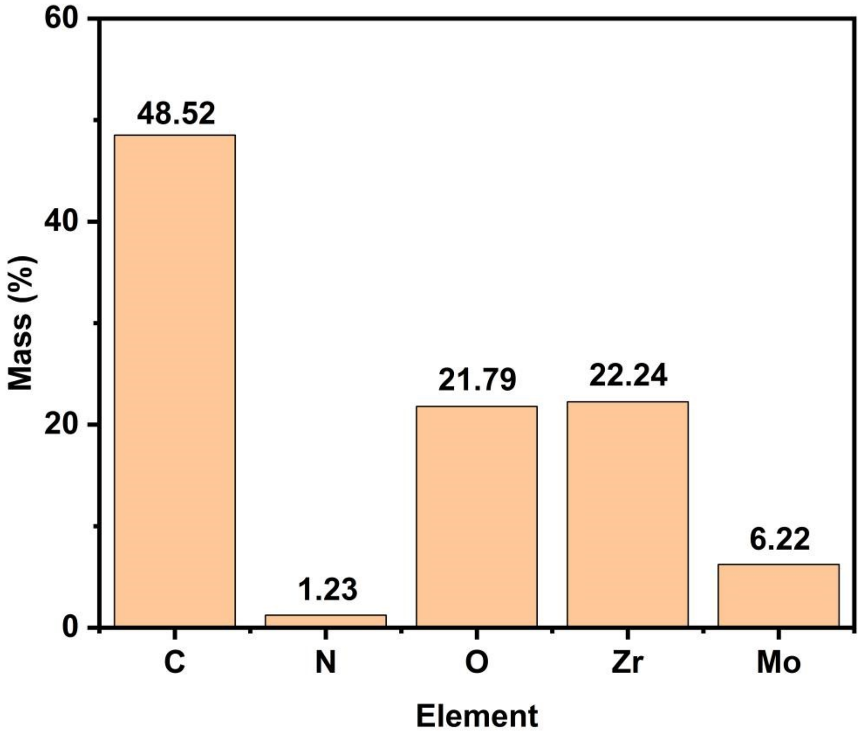

Figure S2. Quality percentage of different elements over $C_{12}Py]_3(NH_4)_3Mo_7O_{24}$/T-MOF-808-15%.

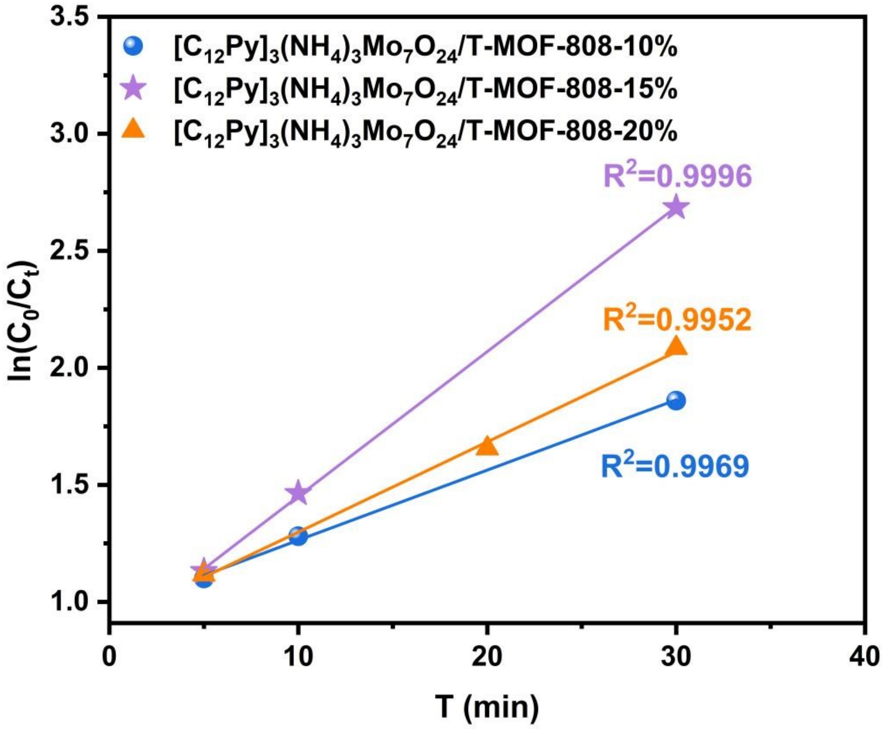

Figure S3. Pseudo-first-order kinetics for the oxidation of DBT at different loading amounts over $[C_{12}Py]_3(NH_4)_3Mo_7O_{24}$/T-MOF-808.

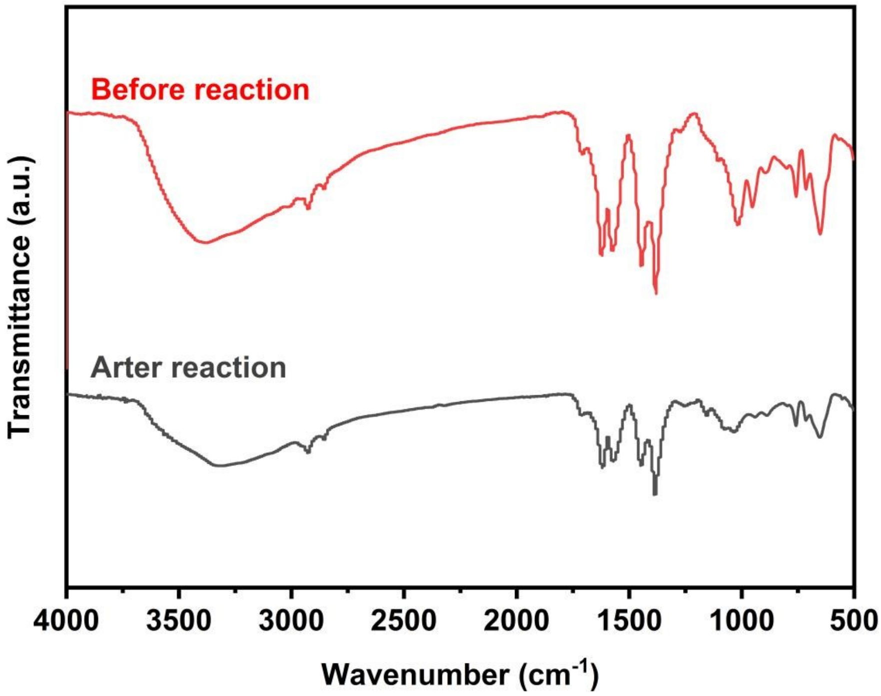

Figure S4. FT-IR spectra of $[C_{12}Py]_3(NH_4)_3Mo_7O_{24}$/T-MOF-808-15% catalyst before and after reaction.

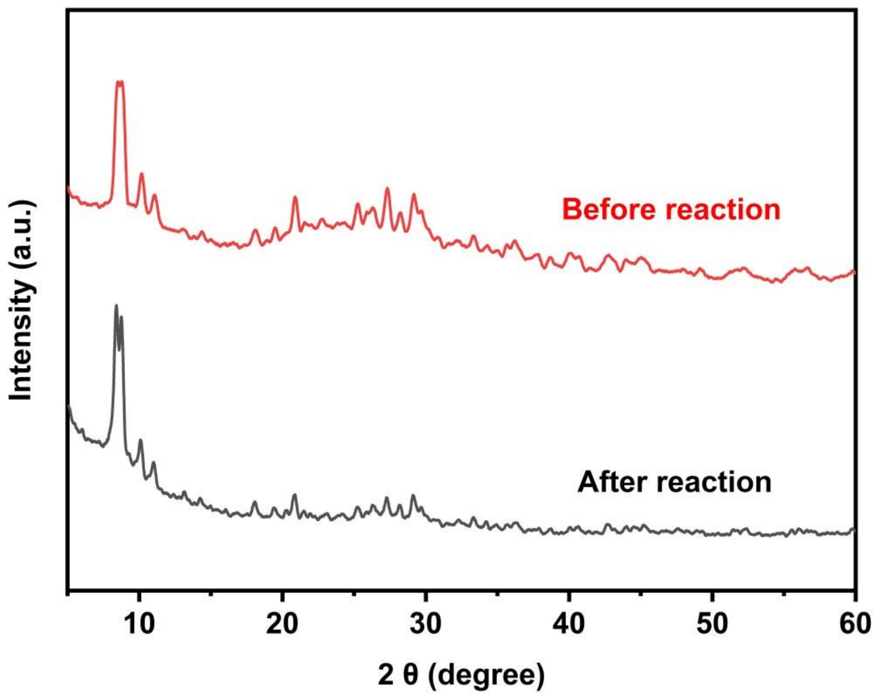

Figure S5. XRD patterns of $[C_{12}Py]_3(NH_4)_3Mo_7O_{24}$/T-MOF-808-15% catalyst before and after reaction.

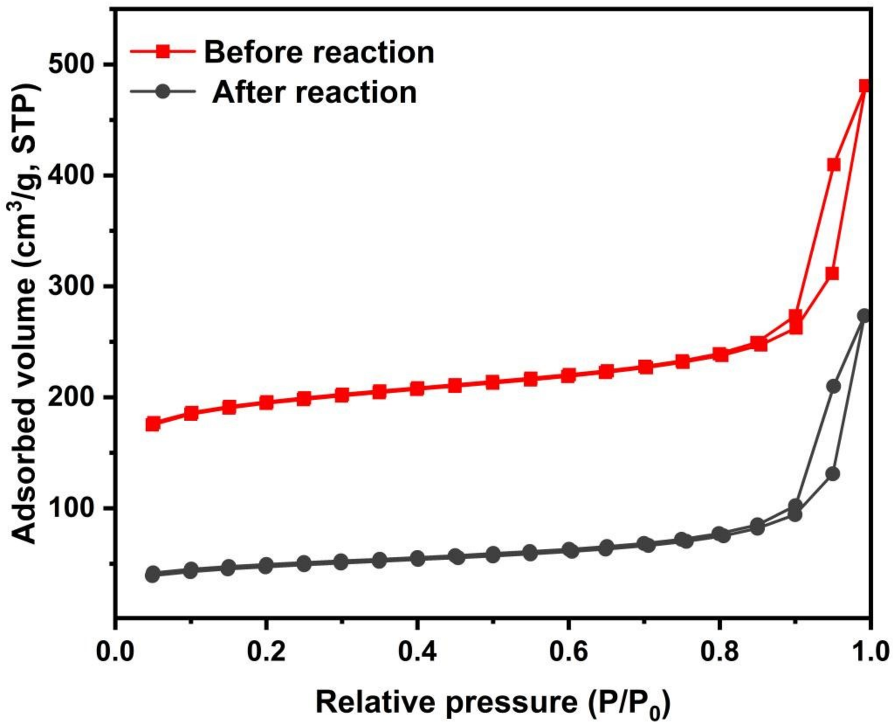

Figure S6. N_2 adsorption-desorption isotherms of $[C_{12}Py]_3(NH_4)_3Mo_7O_{24}$/T-MOF-808 before and after reaction.

Table S1. Textural properties of different samples.

Samples	BET surface area (m^2/g)	Pore Volume (cm^3/g)	Pore Diameter (nm)
MOF-808	924.78	0.81	3.05
T-MOF-808	899.89	0.74	3.06
$[C_{12}Py]_3(NH_4)_3Mo_7O_{24}$/T-MOF-808-10%	687.21	0.65	17.45
$[C_{12}Py]_3(NH_4)_3Mo_7O_{24}$/T-MOF-808-15%	497.83	0.63	30.99
$[C_{12}Py]_3(NH_4)_3Mo_7O_{24}$/T-MOF-808-20%	205.77	0.31	17.35

Table S2. Reaction rate constant corresponding to different loadings in the ODS reaction.

Load capacity (%)	Rate constant k (min^{-1})	Correlation factor R^2
10	0.02999	0.9969
15	0.06185	0.9996
20	0.03851	0.09952

Table S3. Comparison of the ODS performances of different catalysts for DBT

Entry	catalysts	Sulfur ($\mu g \cdot g^{-1}$)	Dosage (mg)	T (^oC)	O/S	t (min)	Conversion rate (%)	Ref.
1	UIO-66	500	100	60	12	150	100	[1]
2	PMo_{11}/g-C_3N_4	100	100	30	10	20	98.6	[2]
3	UiO−66(Zr)-free	1000	50	60	6	120	99.6	[3]
4	Ti_{32}-BTA	200	50	60	6	60	100	[4]
5	PW_{12}@TiO2	500	85	60	6	60	99.9	[5]
6	$[C_{12}Py]_3(NH_4)_3Mo_7O_{24}$/T-MOF-808-15%	500	100	60	6	40	100	This work

References

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