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Electronic Supplementary Information

Synergistic effects of MOF-76 on layered double hydroxides with superior activity for extractive catalytic oxidative desulfurization

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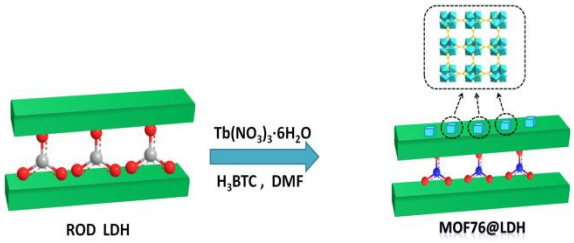


FigS1: The preparation process of the MOF76@LDH.

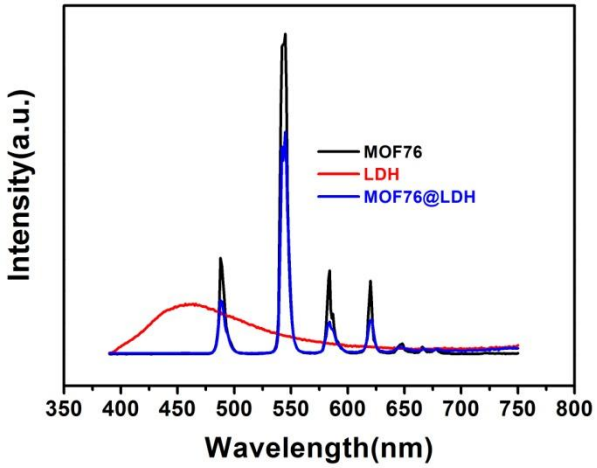
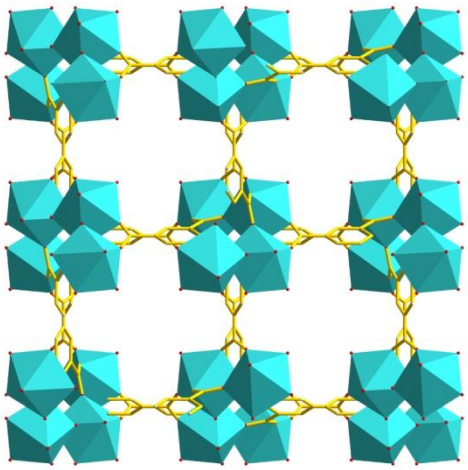
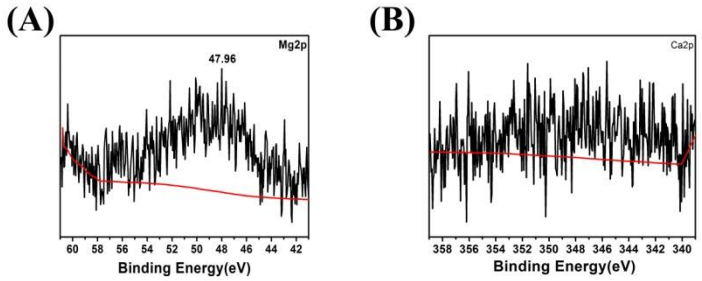


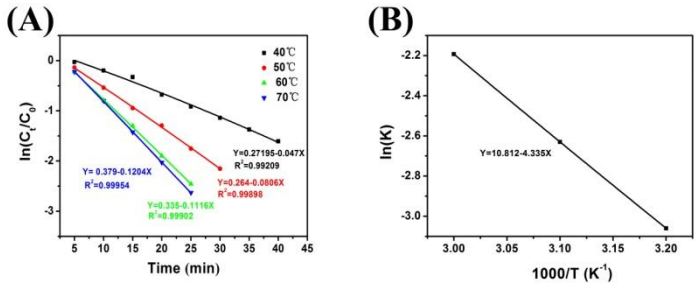
Fig S2: Fluorescence spectra of MOF76, LDH and MOF76@LDH.



FigS3: The structure of the MOF76.



FigS4: High-resolution Mg 2p and Ca 2p XPS spectrum of MOF76@LDH.



FigS5: Desulfurization kinetics of sulfur removal of DBT

LDH supporter	MOF76 addition amount(mg)	The weight percent in the composite tested by ICP(%)		Tb/Ca molar ratio	MOF weight percent in the composite(%)	The denotation of compoosite
		Ca	Tb			
LDH	47	0.65	1.85	0.7156	40	40% wt.MOF76@LDH
LDH	70	0.61	2.07	0.8563	45	45% wt.MOF76@LDH
LDH	100	0.53	2.06	0.9782	49	49% wt.MOF76@LDH
LDH	117	0.63	2.44	0.9694	49	49% wt.MOF76@LDH
LDH	141	0.52	2.04	0.9778	49	49% wt.MOF76@LDH

Table S1: The composition of MOF76@LDH composites, which was calculated from the ICP.

Catalyst	Ca:Mg:Al	BET surface area(m^2g^{-1})	Pore volume(cm^3g^{-1})	Pore width(nm)
MOF76@LDH	0.03:0.36:0.51	72.019	0.183	0.673, 0.814

Table S2: The atomic ratio of Ca, Mg and Al was determind by ICP measurement. The BET surface areas, pore volume and pore width of the 49% wt.MOF76@LDH catalyst.

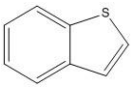
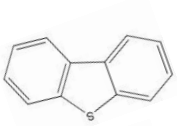
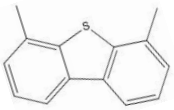
substrate	structure	size
BT		3.62×5.51×6.51Å
DBT		3.62×5.57×7.86Å
4,6-DMDBT		3.62×6.17×7.86Å

Table S3: Structures and sizes of the typical aromatic organosulfur compounds.

Entry	Catalyst	Ea(KJ/mol)	Sulfur removal%
1	MIL-47	51	99.9
2	PTA@MOF-808A	29	100
3	PTA@MIL101(Al)-NH_2	34.1	100
4	MDC-C	19	97.1
5	MDC-P	25	96.8
6	MOF808	22	100
7	MOF76@LDH	10.81	100

Table S4: The removal of DBT in various ODS systems with different apparent activation energies.