Supporting information for

Towards Active Macro-mesoporous Hydrotreating Catalyst: Synthesis and Assembly of Mesoporous Alumina Microspheres

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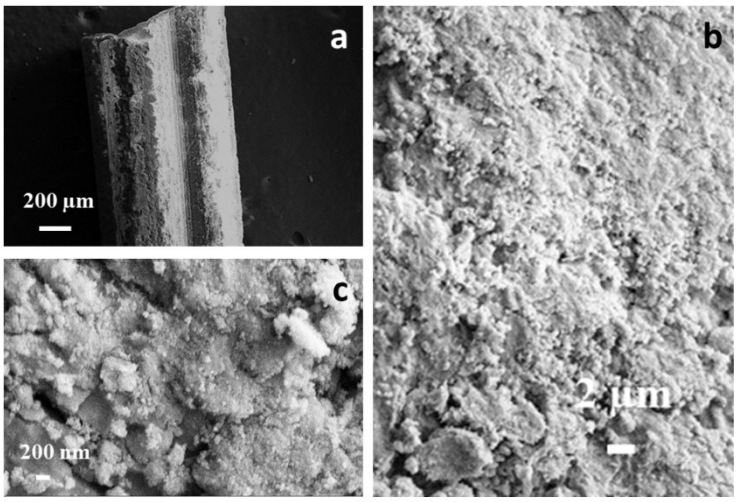


Fig. S1 SEM images of commerical alumina.

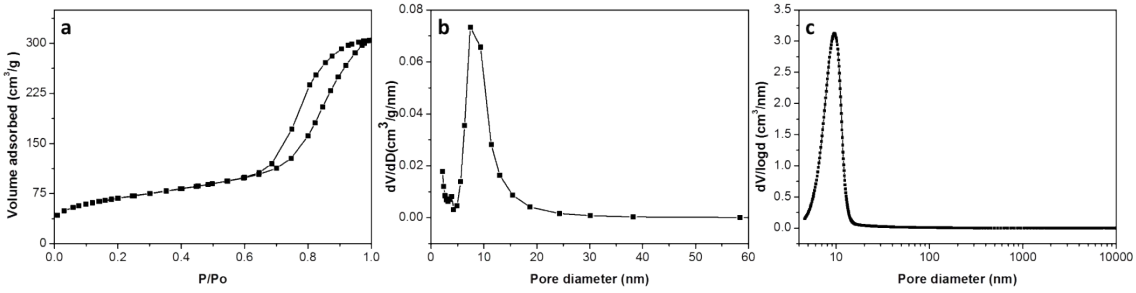


Fig. S2 (a) N_2 adsorption isotherms, (b)BJH pore size distribution and (c) mercury porosimetry data of the commercial alumina.

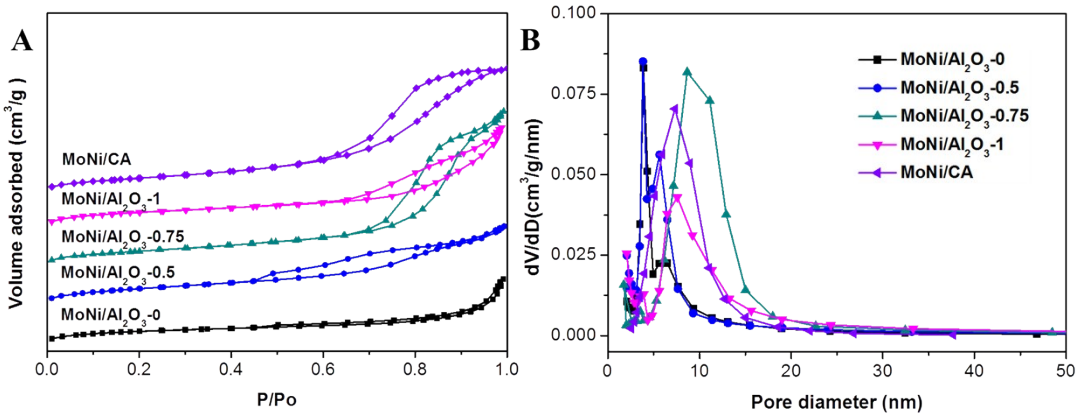


Fig. S3 (A) N_2 adsorption isotherms and (B) BJH pore size distribution of the catalysts.

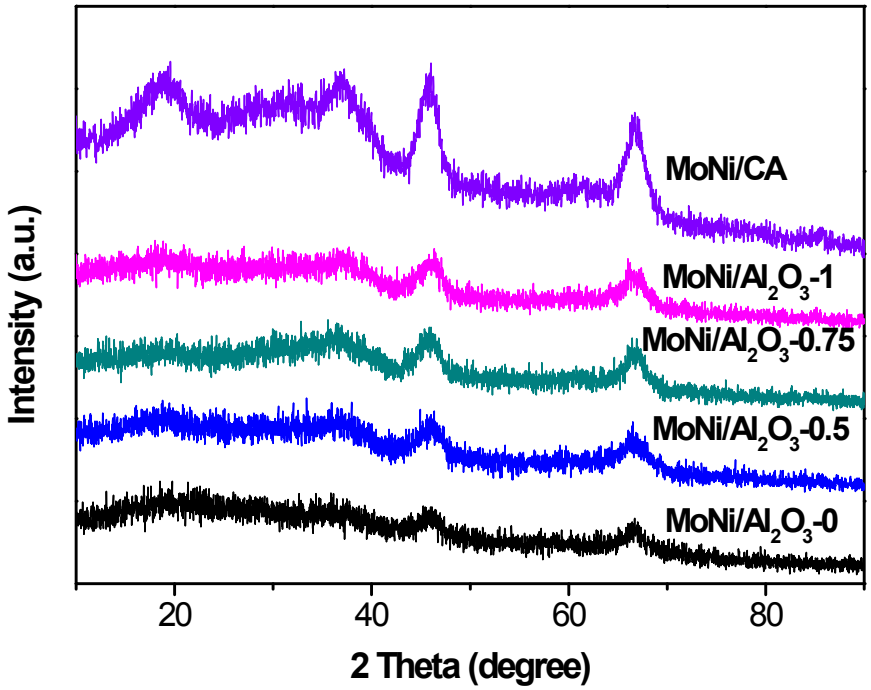


Fig. S4 XRD patterns of MoNi/Al_2O_3-0, MoNi/Al_2O_3-0.5, MoNi/Al_2O_3-0.75, MoNi/Al_2O_3-1 and MoNi/AC.

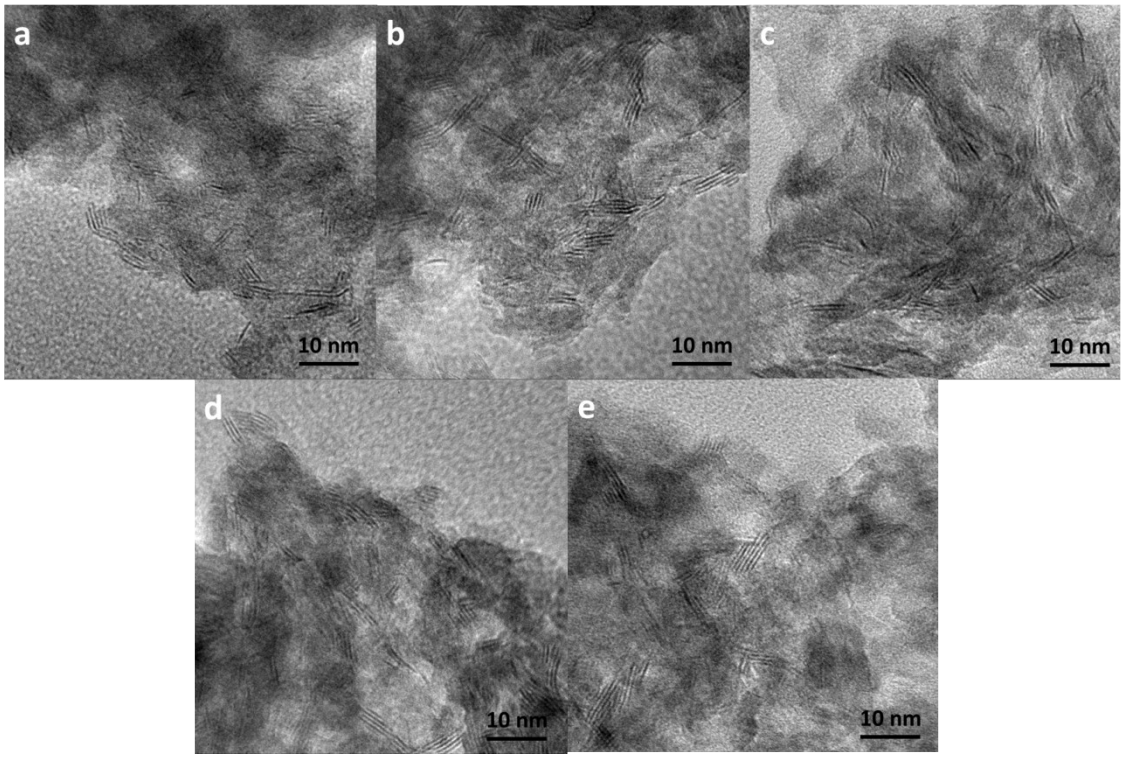
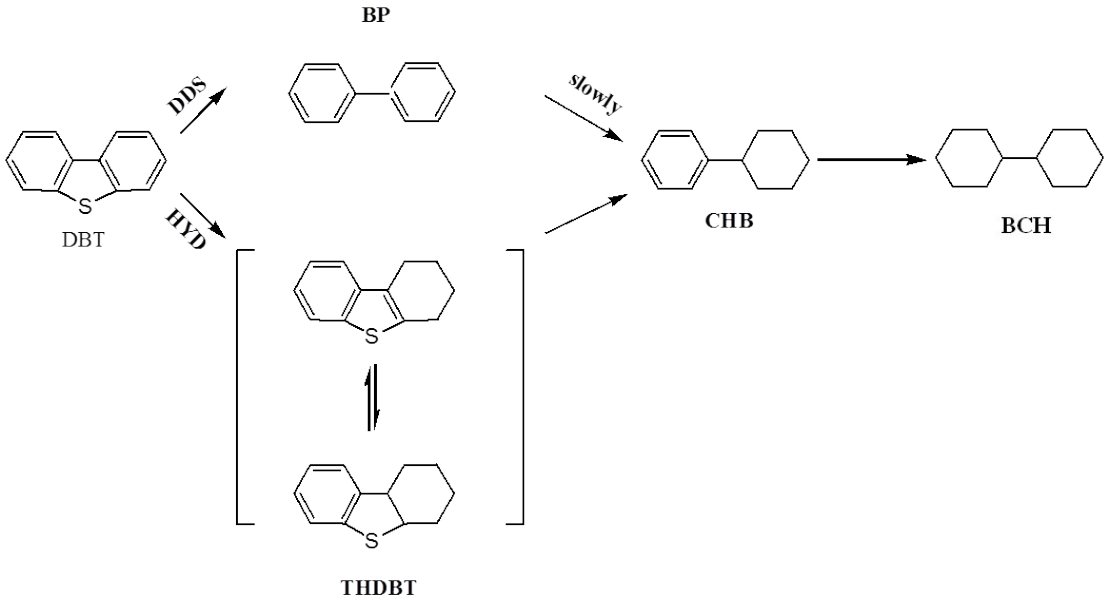


Fig. S5 HRTEM images of the sulfided MoNi/ Al_2O_3-0(a), MoNi/Al_2O_3-0.5 (b), MoNi/Al_2O_3-0.75(c), MoNi/Al_2O_3-1 (d) and MoNi/AC (e).



Scheme 1S Reaction network of HDS of DBT.

Table S1 Initial activities and product distributions for the transformation of dibenzothiophene over sulfided catalysts[a]

Sample	R[b] (10^{-7}mol·g^{-1}·s^{-1})	Product selectivity (%)			HYD/DDS ratio
		BP[c]	CHB[c]	BCH[c]	
NiMo/Al_2O_3-0	5.07	87.8	9.9	2.3	0.14
NiMo/Al_2O_3-0.5	6.09	85.3	12.6	2.1	0.17
NiMo/Al_2O_3-0.75	6.90	83.9	13.6	2.5	0.19
NiMo/Al_2O_3-1	5.54	86.3	11.5	2.2	0.16
NiMo/AC	5.28	85.5	12.2	2.3	0.17

a: Reaction conditions: temperature, 270 ^oC; H_2 pressure, 1.5 Mpa; LHSV, 10 h^{-1}; H_2/liquid (v/v), 600; feed, 2wt.% DBT in cyclohexane

b: Average specific rate (moles of DBT transformed per second and per gram of catalyst)

c: BP: biphenyl; CHB: cyclohexylbenzene; BCH: bicyclohexyl.

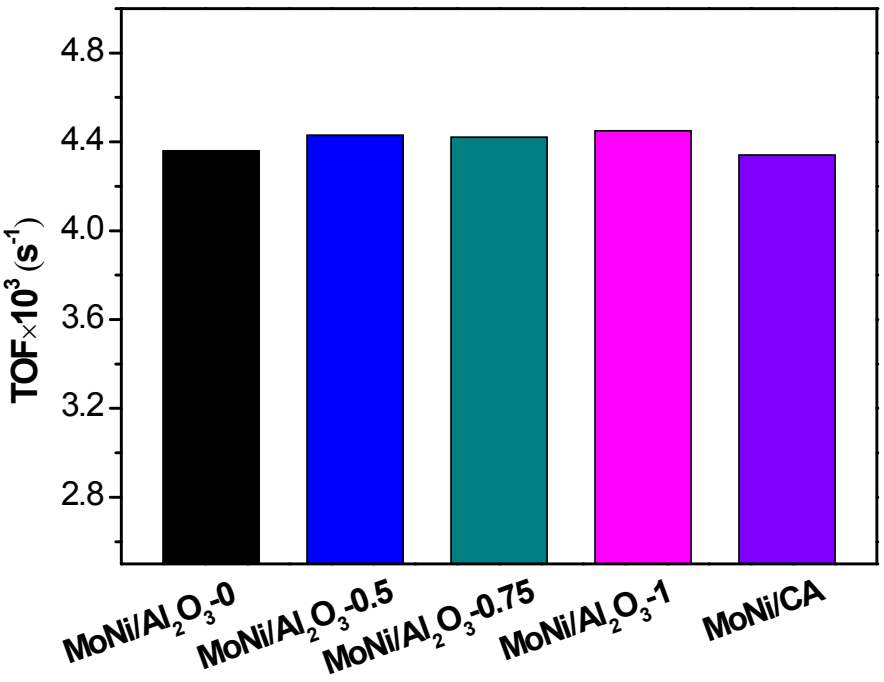


Fig. S6 Turnover frequency (TOF, s^{-1}) of HDS for the sulfided catalysts

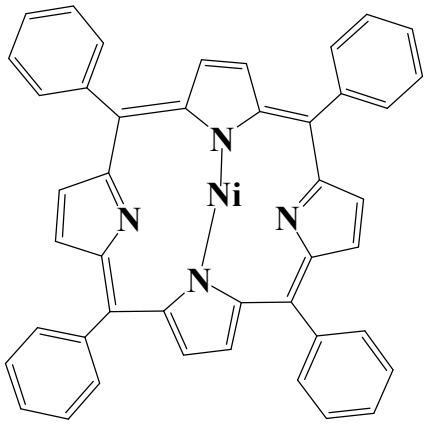


Fig. S7 Molecular formula of Nickel-5, 10, 15, 20-tetraphenylporphyrin (Ni-TPP)