Electronic Supplementary Information
for
Sacrificial Carbonaceous Coating over Alumina Supported Ni-MoS$_2$ Catalyst for Hydrodesulfurization

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**Fig. S1**  XRD patterns of NiMoAl@PDA-0, NiMoAl@PDA-1 and NiMoAl@C-1 Samples.

**Fig. S2** Nitrogen adsorption-desorption isotherms (a) and pore size distributions (b) of the catalysts.
Fig. S3 Typical HRTEM images of the sulfided NiMoAl-1 catalyst.

Fig. S4 C 1s spectra of NiMoAl-0, NiMoAl-1 and NiMoAl-1°.
Scheme S1 Proposed reaction network of DBT over HDS catalysts through DDS (direct desulfurization) and HYD (hydrodesulfurization) pathways. BP: biphenyl; THDBT: tetrahydrodibenzothiophene; CHB: cyclohexylbenzene; BCH: bicyclohexyl.
| Catalysts  | Weight Loss (%) |
|------------|-----------------|
|            | 40~140 °C | 140~400 °C | 400~700 °C |
| NiMoAl-0   | 5.87       | 6.4        | 4.3        |
| NiMoAl-0.5 | 3.60       | 11.1       | 5.5        |
| NiMoAl-1   | 3.80       | 12.1       | 8.1        |
| NiMoAl-1.5 | 4.64       | 13.8       | 9.6        |
| NiMoAl@C   | 4.03       | 12.1       | 7.8        |
| NiMoAl@PDA | 3.37       | 13.2       | 8.0        |

Table S1 Weight losses at different temperature ranges of the NiMoAl-x precursors.