Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

Supplementary Information

Ultradeep hydrodesulfurization of fuel over superior NiMoS phases constructed by novel $Ni(MoS_4)_2(C_{13}H_{30}N)_2$ precursor

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Table S1 Properties of FCC diesel.

Item	Value
Density (20 °C) ($g \cdot cm^{-3}$)	0.856
Sulfur ($\mu g \cdot g^{-1}$)	3640
Kinematic viscosity (20 °C) ($mm^2 \cdot s^{-1}$)	5.39
Cetane number	39
Distillation (ASTM D86) (°C)	
IBP	210
10%	249
50%	296
90%	342
FBP	363

The typical HRTEM images of s-NiMo/γ-Al_2O_3-DE and s-NiMo/γ-Al_2O_3-D are shown in Fig. S1. Most of MoS_2 slabs on s-NiMo/γ-Al_2O_3-DE (Fig. S1a) have the same length and stacking layer number as those of s-NiMo/γ-Al_2O_3-D (Fig. S1b). In addition, s-NiMo/γ-Al_2O_3-DE has almost the same distributions of lengths (Fig. S1c) and stacking layer numbers (Fig. S1d) of the MoS_2 slabs as those of s-NiMo/γ-Al_2O_3-D.

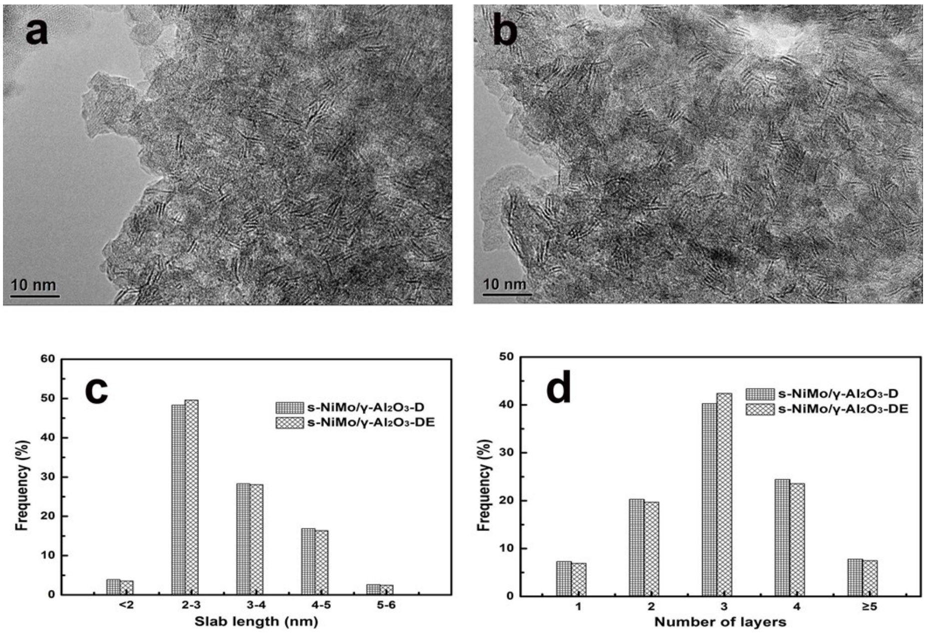

Fig. S1. HRTEM images of s-NiMo/γ-Al_2O_3-DE (a), s-NiMo/γ-Al_2O_3-D (b); statistical distributions of the lengths (c) and stacking numbers (d) of MoS_2 slabs on s-NiMo/γ-Al_2O_3-DE and s-NiMo/γ-Al_2O_3-D.

The reaction rate constants (k_{HDS}) and TOF values of s-NiMo/γ-Al_2O_3-D (prepared using alumina powder as a support) and s-NiMo/γ-Al_2O_3-DE (prepared using alumina extrude as a support) for 4,6-DMDBT HDS are listed in Table S2. s-NiMo/γ-Al_2O_3-DE has almost the same k_{HDS} (6.32×10^{-7} mol g^{-1} s^{-1}) and TOF value (9.98×10^{-4} s^{-1}) as those of s-NiMo/γ-Al_2O_3-D.

Table S2 HDS results for 4,6-DMDBT on s-NiMo/γ-Al_2O_3-D and s-NiMo/γ-Al_2O_3-DE.

Catalyst	k_{HDS} (10^{-7} molg^{-1} s^{-1})	TOF×10^4 (s^{-1})
s-NiMo/γ-Al_2O_3-D	6.35	10.01
s-NiMo/γ-Al_2O_3-DE	6.32	9.98