

Supplementary information: Post Synthesis of Aluminum Modified Mesoporous TUD-1 Materials and Their Application for FCC Diesel Hydrodesulfurization Catalysts

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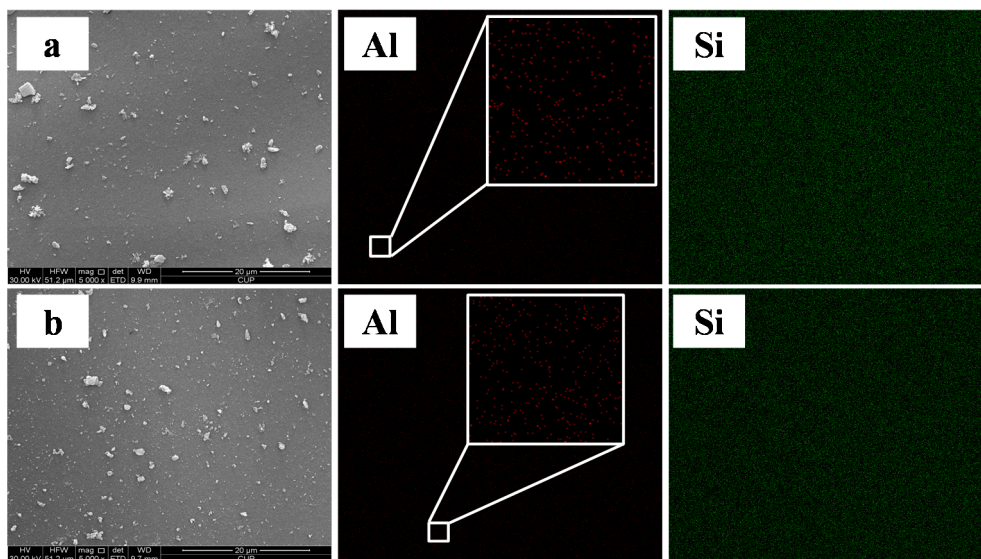


Figure S1. Elemental mapping analysis of PAT materials (a) PAT-3; (b) PAT-4.

Al and Si element distributions are investigated by EDS element mapping technology, and the pictures are shown in Figure S1. It is obvious that the Al phases exhibit high dispersion on the surfaces of both of the materials PAT-3 and PAT-4, meaning homogenous distributions of Al species throughout the PAT materials.

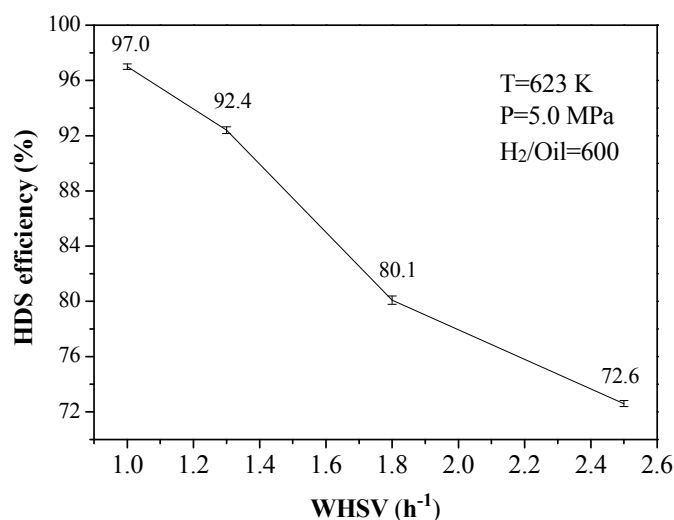


Figure S2. The influence of different WHSV to HDS efficiency over NiMo/APAT-3 catalyst.

The larger the WHSV, the more raw materials be passed through the catalysts in the unit time, and the shorter the reaction residence time becomes, leading to the lower conversion. Hence, compared with the previous experiments, the operating condition of WHSV of the new experiments was changed, and other conditions were kept constant. Figure S2 shows the influence of different WHSV to conversion over NiMo/APAT-3 catalyst. From the figure, with the increase of WHSV, the HDS efficiencies decrease. When the operating is under the conditions of 623 K of temperature, 5.0 MPa of pressure, 600 of H₂/Oil ratio and 2.5 h⁻¹ of WHSV over NiMo/APAT-3 catalyst, the HDS efficiency is just 72.6%.

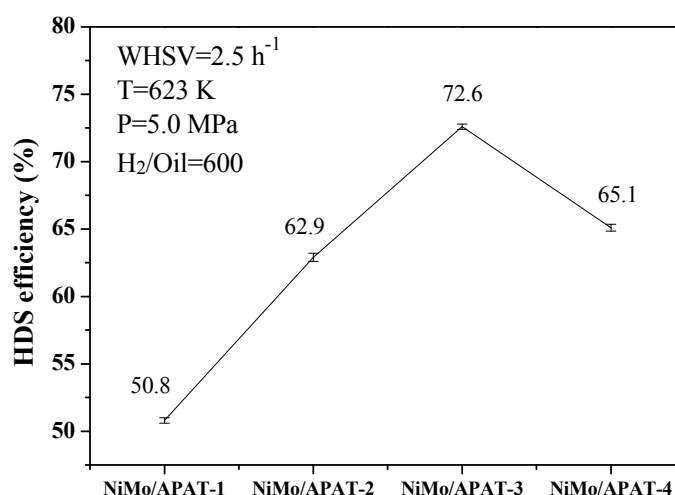


Figure S3. The lower conversion of the corresponding catalysts at a larger WHSV condition.

Figure S3 shows the lower conversion of the corresponding catalysts under the conditions of 2.5 h⁻¹ of WHSV, 623 K of temperature, 5.0 MPa of pressure and 600 of H₂/Oil ratio. From the figure, the order of the HDS efficiencies is consistent with that of the previous experiments. The HDS efficiency of the corresponding catalysts has following sequence: NiMo/APAT-3 > NiMo/APAT-4 > NiMo/APAT-2 > NiMo/APAT-1.