Supplementary Information

On the morphology of MoS_2 slabs on MoS_2/Al_2O_3 catalysts: the influence of Mo loading

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1 Raman characterization of oxidic Mo/Al_2O_3 precursors

Raman spectroscopy was obtained on a Jobin Yvon Labram 300 Raman spectrometer equipped with a confocal microscope, a He−Ne laser (632.8nm), and a CCD detector. The samples were in the powder form, and the spectra were recorded at ambient conditions in the region of 100−1100 cm^{-1} in 10 accumulations of 20 s.

As shown in Figure S1, the Raman spectrum of Al_2O_3 is essentially featureless in the region of 100-1000 cm^{-1}, whereas the supported molybdenum oxide species possess several Raman bands in this region. On the 6 wt% Mo/Al_2O_3 samples, the bands at 945 cm^{-1} and 921 cm^{-1} were recorded, which are attributed to respectively Mo=O band stretching of ploymerized and isolated molybdenum oxide. With increasing Mo loading, the bands at 945 cm^{-1} is shifted to 954 cm^{-1}, which indicates according to the literature the formation of hepta- and octamolybdates.[1, 2] Meanwhile, the intensity of the 921 cm^{-1} band decreases with Mo loading. Consistent with the literature, these Raman band changes suggests that with increasing Mo loading, the isolated, octahedral coordinated

molybdenum oxide species decreases while the hepta- and octamolybdates species increases.

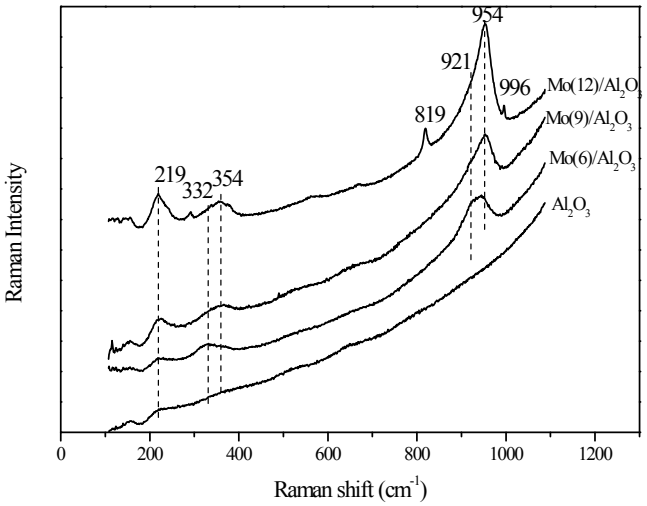

Figure S1: Raman spectra of oxidic Mo/Al_2O_3 precursors as a function of Mo loading. Spectra were obtained under ambient conditions.

2 References

1. H. C. Hu, I. E. Wachs and S. R. Bare, *J. Phys. Chem.*, 1995, **99**, 10897-10910.
2. K. V. R. Chary, K. R. Reddy, G. Kishan, J. W. Niemantsverdriet and G. Mestl, *J. Catal.*, 2004, **226**, 283-291.