

SUPPORTING INFORMATION

Co-promoted MoO₃ Nanoclusters for Hydrodesulfurization

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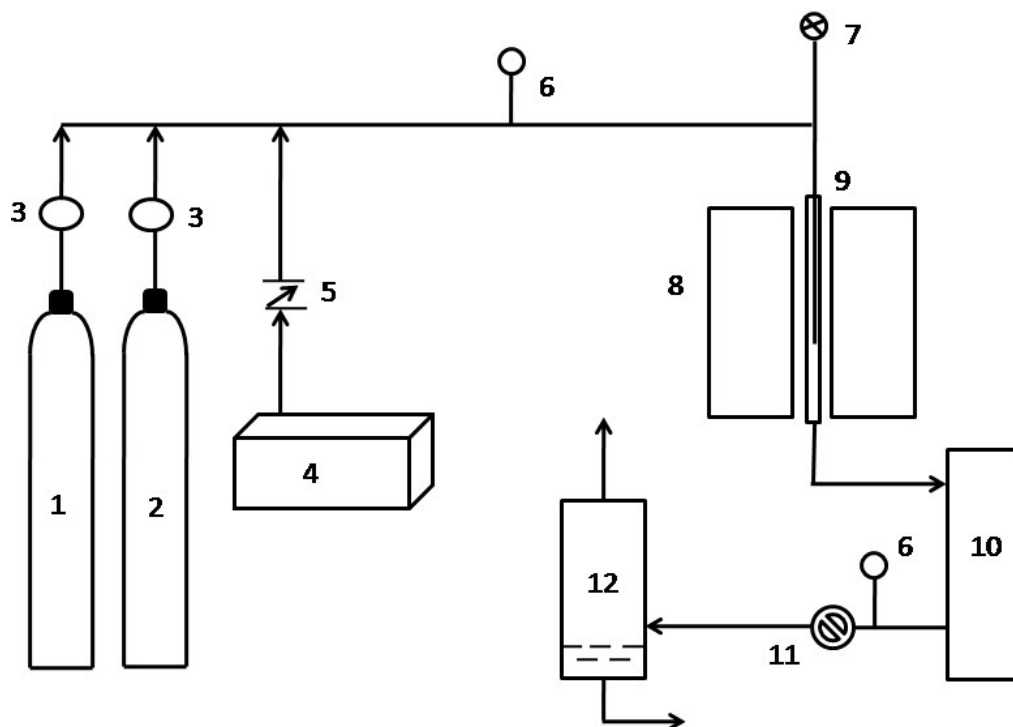
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1) H₂ gas cylinder 2) He gas cylinder 3) Mass flow controller 4) HPLC pump 5) Check valve 6) Pressure gauge 7) Thermocouple 8) Furnace 9) Reactor 10) Condenser 11) Back pressure regulator 12) Gas liquid separator

Fig. S1 Schematic diagram of the experimental set-up.

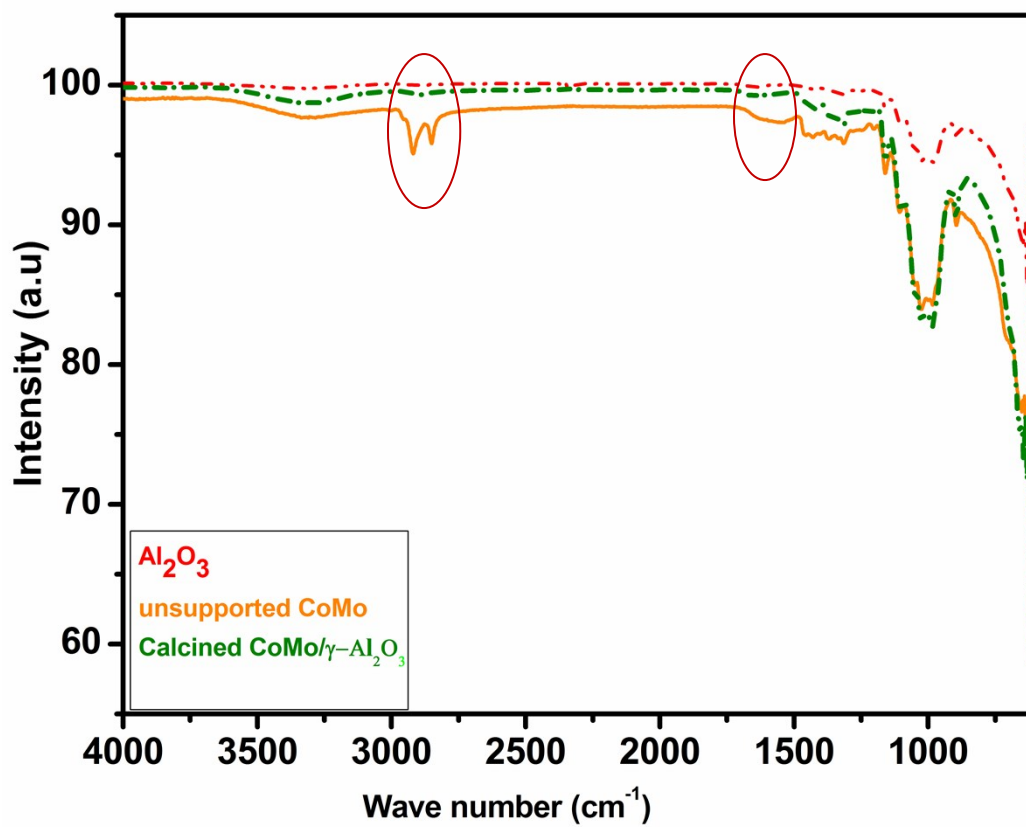


Fig. S2 FT-IR spectra of Co-promoted MoO₃ nanoclusters.

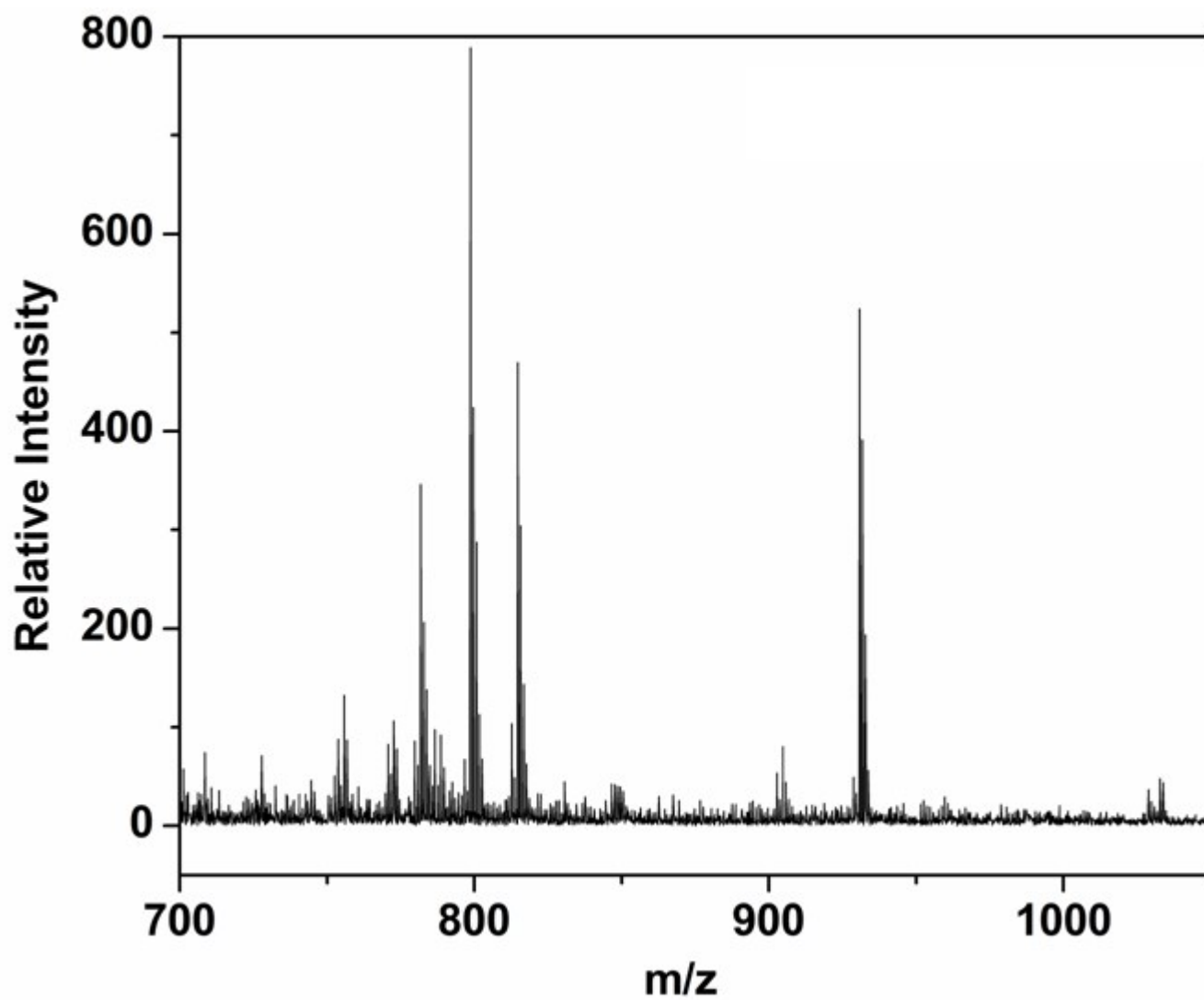


Fig. S3 MALDI-TOF mass spectra of unsupported Co-promoted MoO₃ nanoclusters nano clusters showing Co₂Mo₆O₂₀ cluster formation.

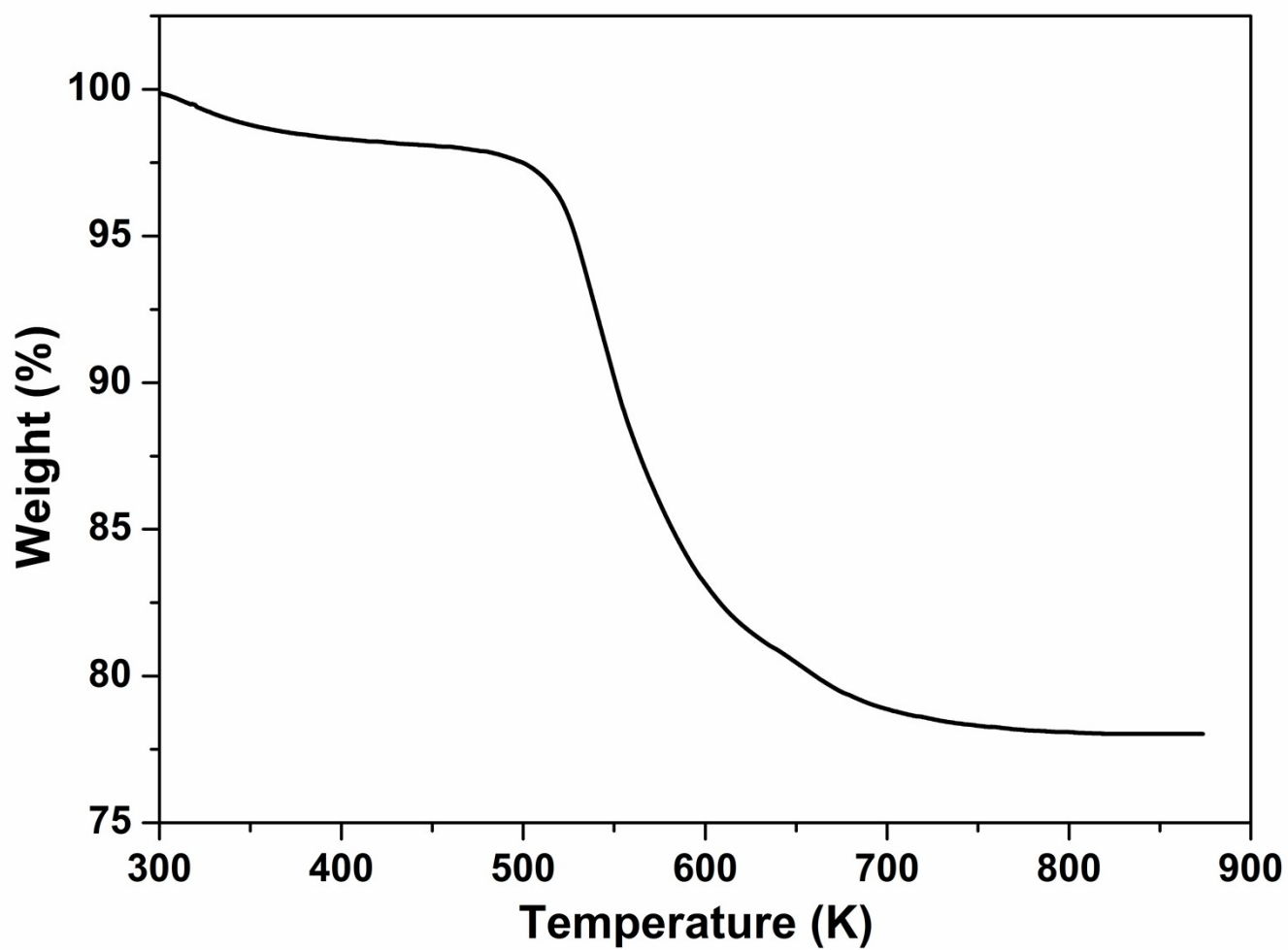


Fig. S4 TGA analysis of unsupported Co-promoted MoO₃ nanoclusters.

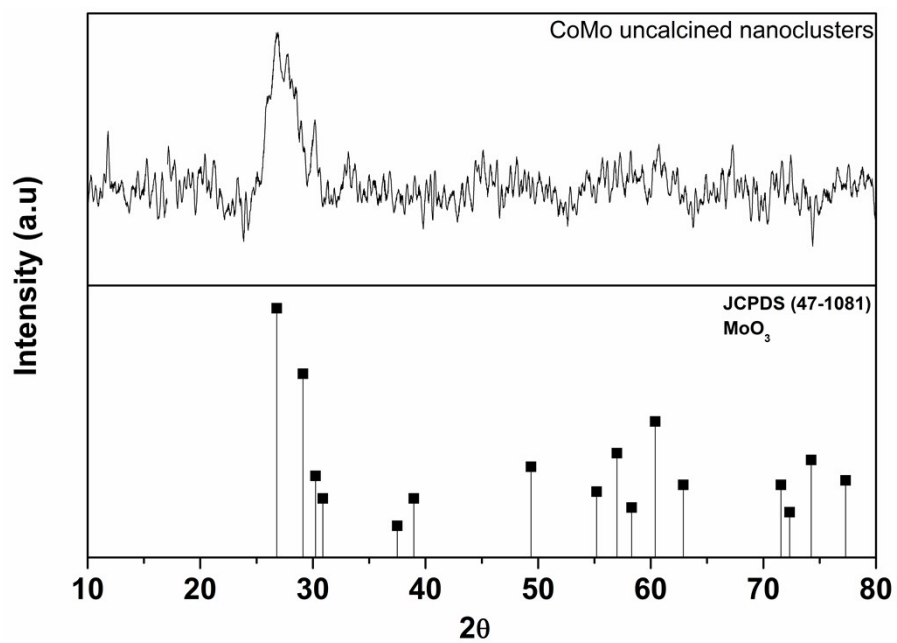


Fig. S5 XRD analysis of unsupported CoMo nanoclusters (uncalcined)

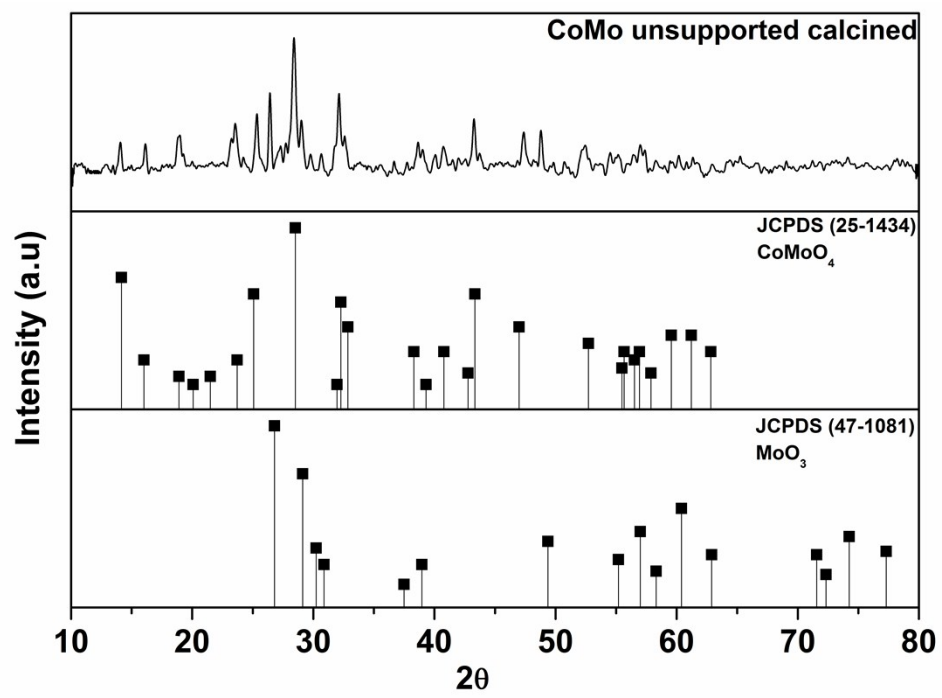


Fig. S6 XRD analysis of unsupported CoMo calcined nanoparticles

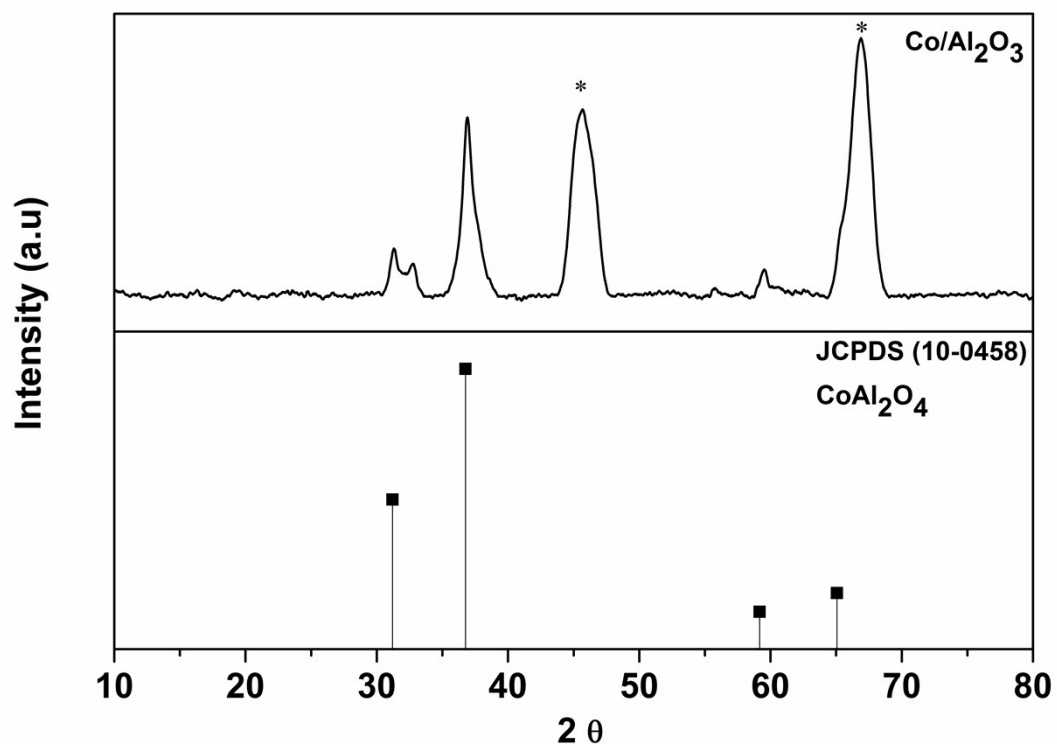


Fig. S7 XRD analysis of calcined $\text{Co}/\gamma\text{-Al}_2\text{O}_3$ (*: $\gamma\text{-Al}_2\text{O}_3$)

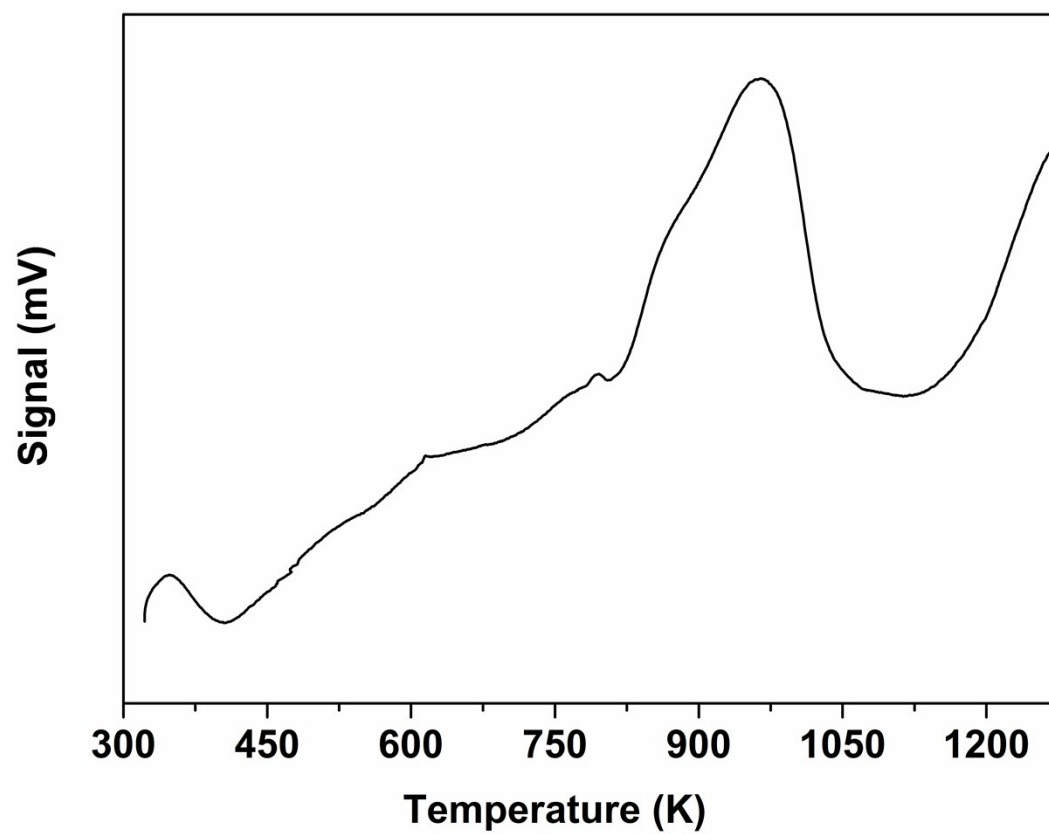


Fig. S8 TPR analysis of calcined Co/Al₂O₃

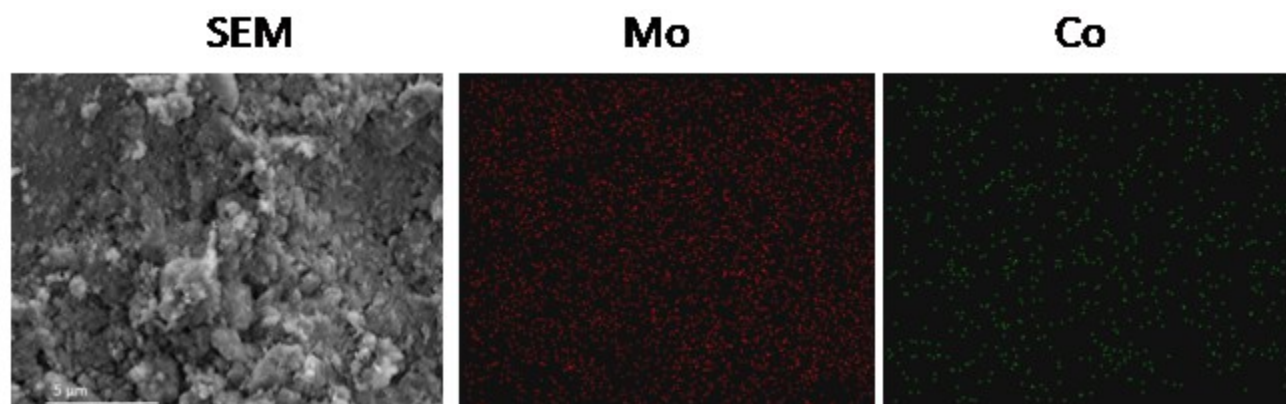


Fig. S9 SEM-EDX images of CoMo 2 catalyst

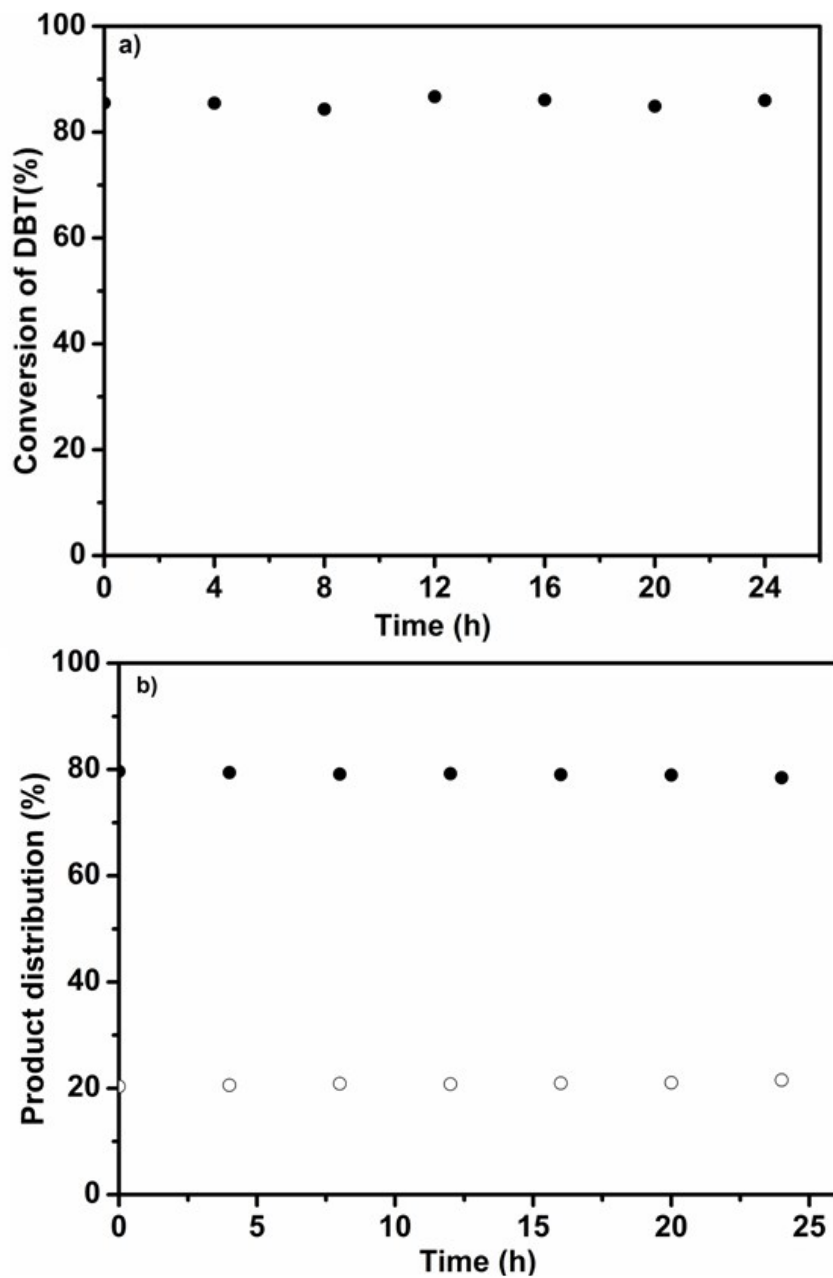


Fig. S10 Stability test for CoMo₂ catalyst (supported on γ -Al₂O₃) under HDS reaction conditions (T=563 K, amount of catalyst=150 mg, W/F_{Ao} = 2.17 x 10² (kg cat.h/kmol DBT)). Effect of time on a) HDS activity and b) Product selectivity BP CoMo₂ (●) and CHB CoMo₂ (○).

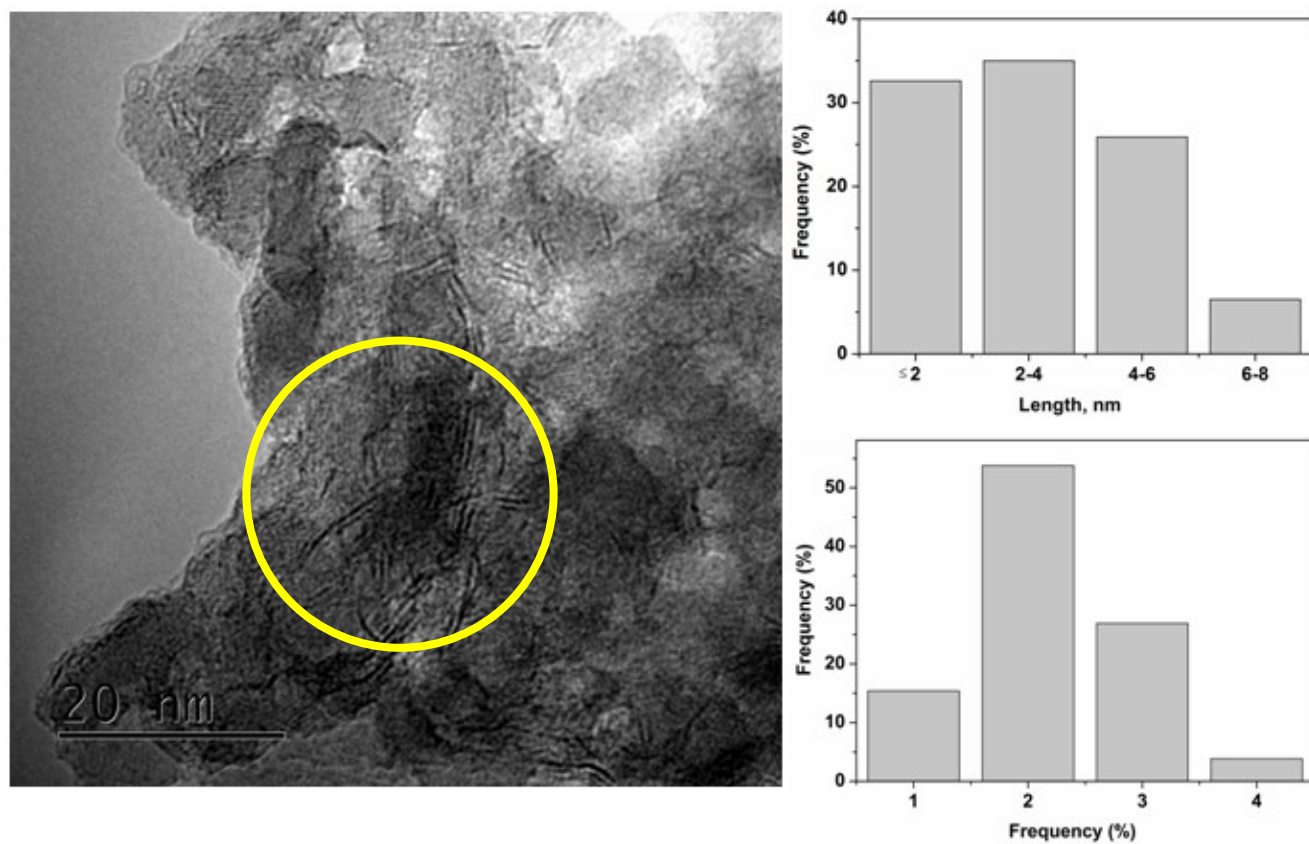


Fig. S11 TEM image of spent CoMo 2.

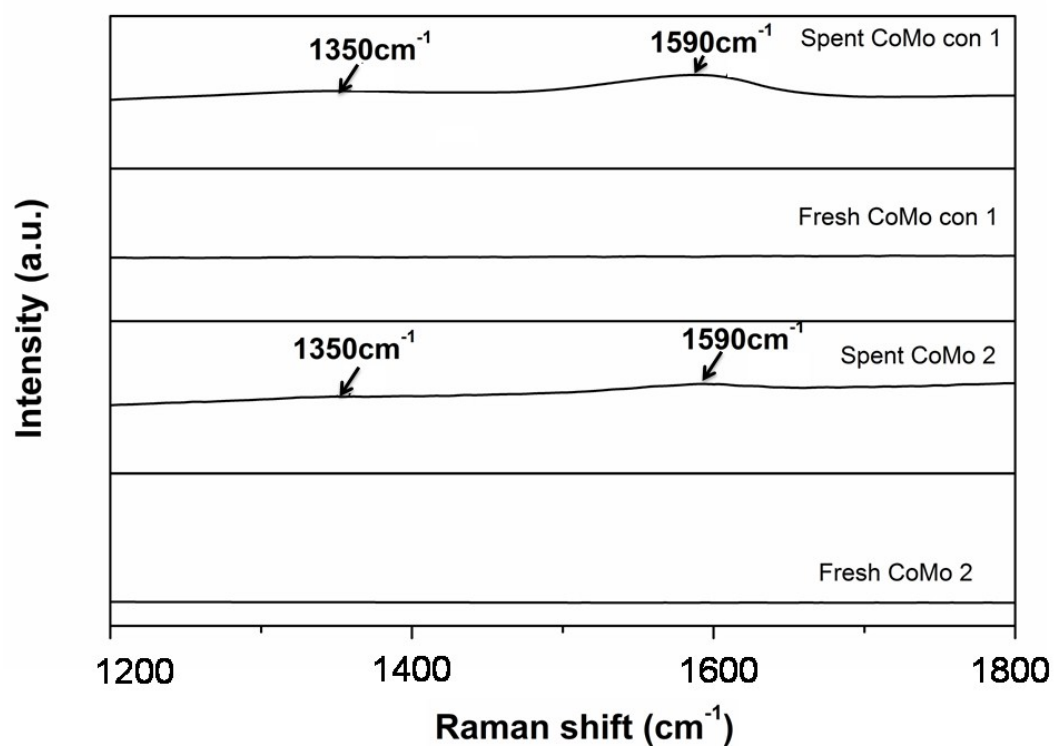


Fig. S12 Raman spectra of CoMo catalyst.