

Supporting Information

Mechanistic insights into hydrodeoxygenation of acetone over Mo/HZSM-5 bifunctional catalyst for the production of hydrocarbons

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Detailed description of GC system

GC (Agilent 8860) with a FID (Flame ion detector) and a TCD (Thermal conductivity detector) detector was applied to the online analysis. The split ratio of the GC inlet is 20:1. A DB-1701 capillary columns were used to separate C5+ condensable liquid products. The DB-1701 column (60 m, 0.250 μm , 0.250 μm) was connected to a flame ionization detector (FID) for product quantification by calibration with external standards. A total of 30 chemical substances are calibrated by the external standard method. A GS-GasPro column (60 m, 0.320 mm) was connected to a thermal conductivity detector (TCD) to measure non-condensable gas (NCG) products (CO, CO₂, C1-C4 hydrocarbons). A standard gas mixture consisting of these NCG compounds was used to calibrate the yield of NCG.

For each run, the GC oven was programmed for a 8 min hold at 30 °C then ramped at 6 °C/min to 150 °C, followed by ramped at 10 °C/min to 250 °C, after which temperature was held constant for 10 min.

Table S1. Summary of detailed calibration coefficient.

Compounds	Calibration	R ²
Atmosphere	H ₂	
<i>Vapors</i>		
Hexene	20568463	0.99
Benzene	16085882	0.99
Toluene	16533299	0.99
Xylene	16892825	0.99
Mesitylene	17584758	0.99
Propylbenzene e	18646125	0.99
Diethylbenzene	19883564	0.99
Indane	18008583	0.99
Indene	17651304	0.99
Naphthalene	19292294	0.99
Naphthalene, methyl-	19893623	0.99
Naphthalene, dimethyl-	20295627	0.99
Anthracene	22567494	0.99
Gas		
Ar	456834	0.99
CO	517683	0.99
CO ₂	320698	0.99
CH ₄	612597	0.99
C ₂ H ₆	320698	0.98
C ₂ H ₄	416924	0.99
C ₃ H ₈	320698	0.99
C ₃ H ₆	457757	0.99
C ₄ H ₁₀	359398	0.99
C ₄ H ₈	374328	0.99

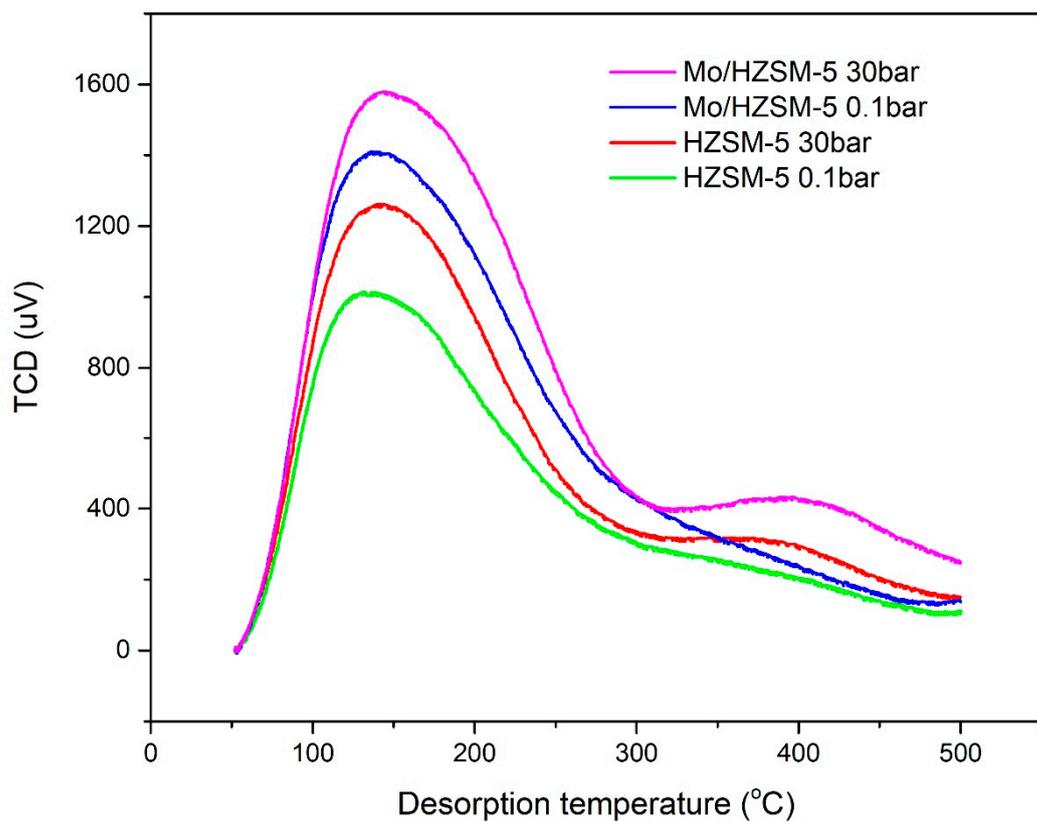


Figure S1. The results of NH₃-TPD for spent catalysts.