

Supporting Information

Tuning the reactivity of molybdenum (oxy)carbide catalysts by the carburization degree: CO₂ reduction and anisole hydrodeoxygenation

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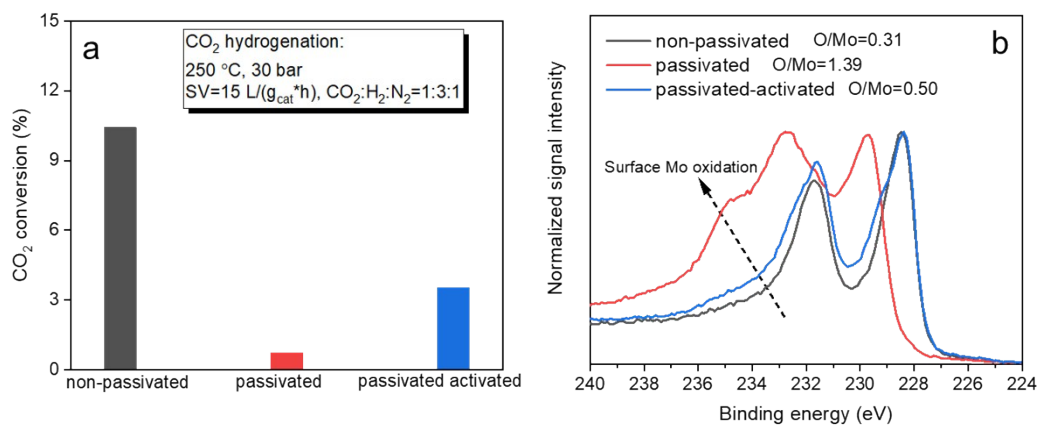


Figure S1. (A) CO₂ conversion over non-passivated, passivated and passivated-activated Mo/C(800) catalysts. (B) Quasi in situ Mo 3d XPS spectra of the catalysts after reaction.

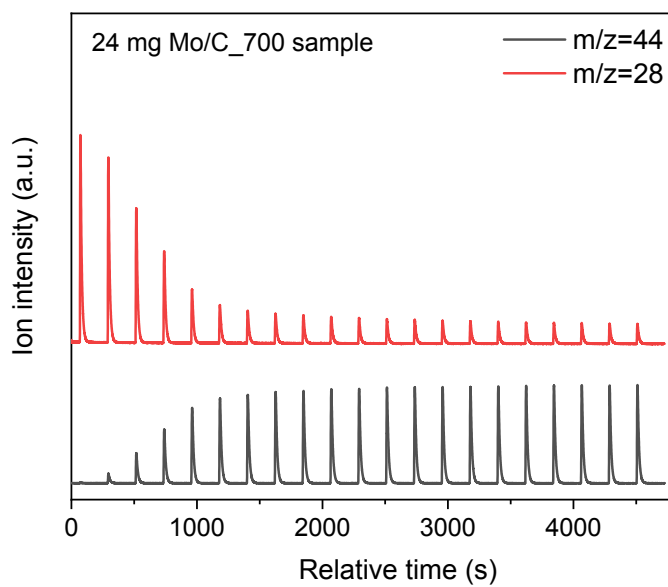


Figure S2. N₂O pulse titration profiles showing N₂O (m/z=44) consumption and N₂ (m/z=28) production over Mo/C(700) catalyst. Conditions: 50 °C, 1 mL 2% N₂O pulse every 4 minutes into 50 mL/min He flow.

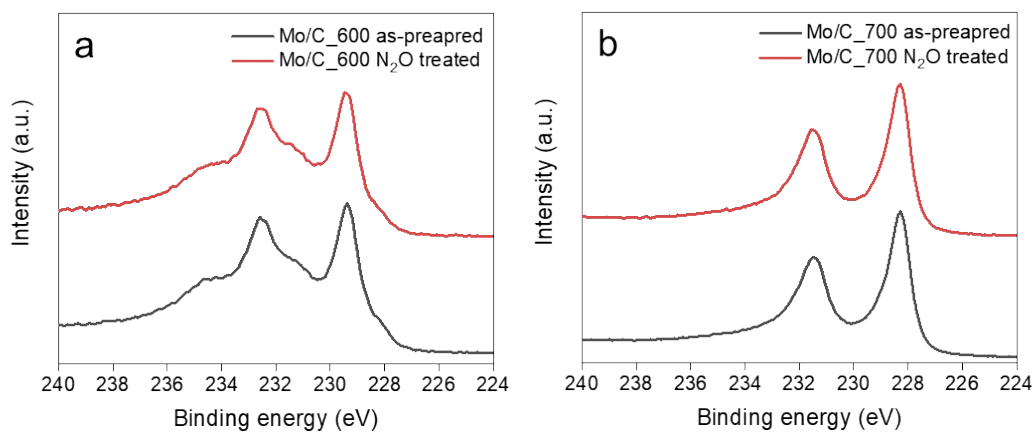


Figure S3. Quasi in situ XP spectra of as-prepared and N_2O treated (a) Mo/C(600) and (b) Mo/C(700) catalysts.

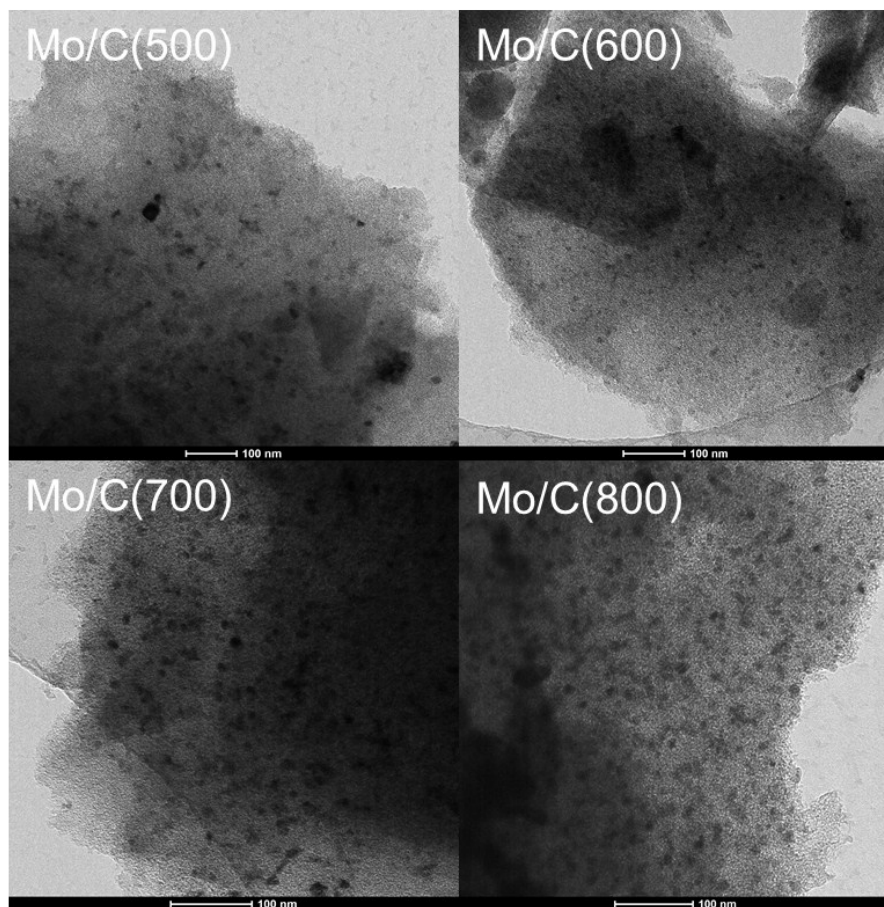


Figure S4. TEM images of as-prepared molybdenum (oxy)carbide catalysts.

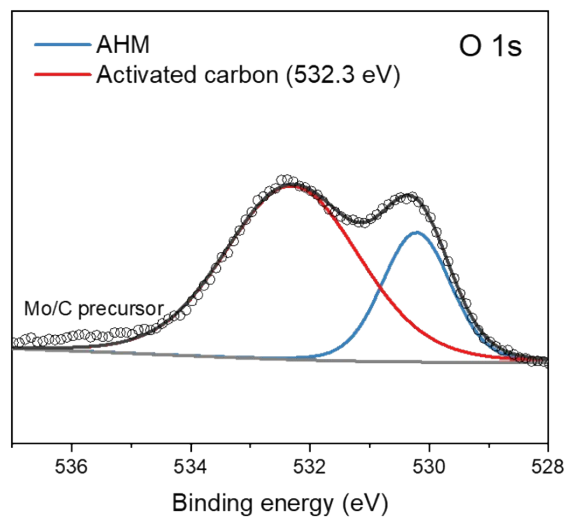


Figure S5. Mo 3d XP spectrum of Mo/C catalyst precursor.

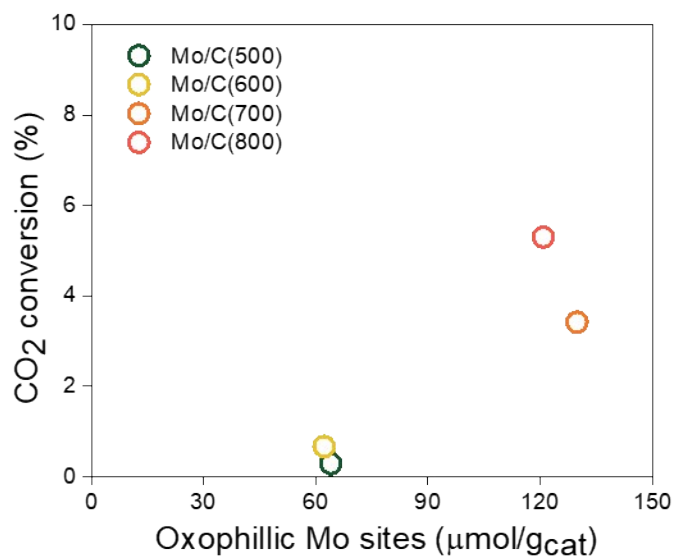


Figure S6. Correlation between CO₂ conversion and oxophilic Mo site density measured by N₂O chemisorption.

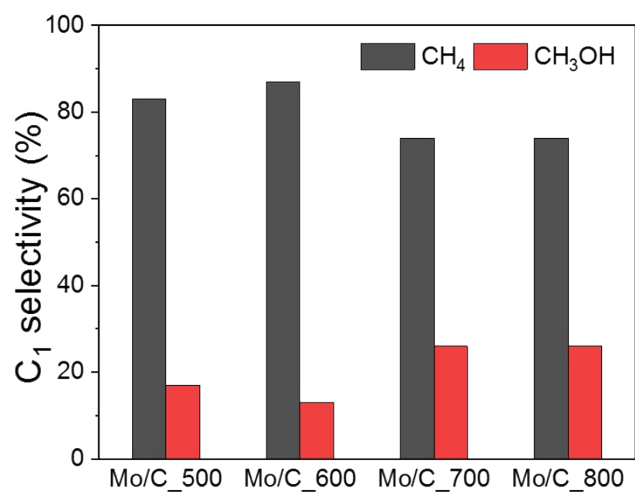


Figure S7. C₁ products selectivity over as-prepared (oxy)carbide catalysts during anisole HDO.

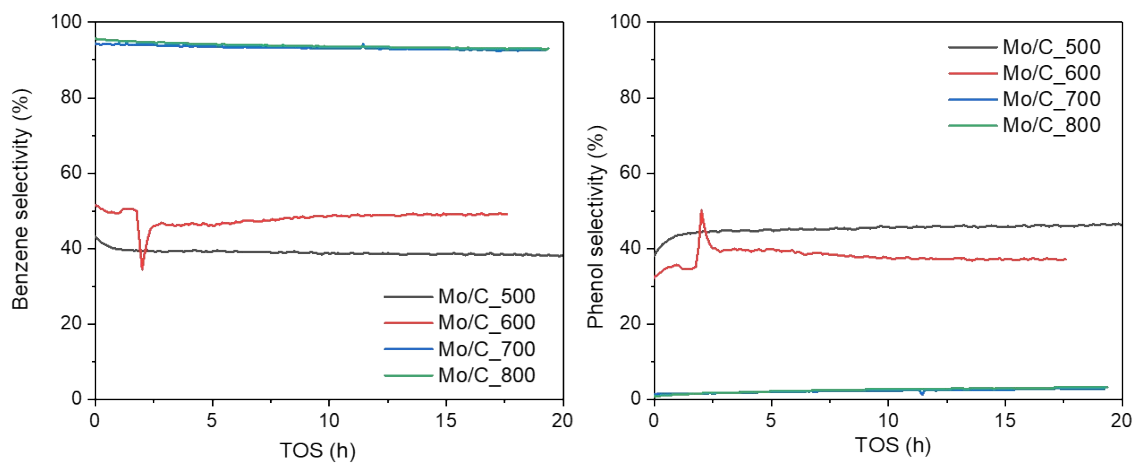


Figure S8. Time-on-stream benzene and phenol selectivity over the molybdenum (oxy)carbide catalysts.