

Electronic Supporting Information

Enhanced coke-resistance of Ca- and Mg-incorporated Mo/V montmorillonite-supported catalysts during gas-phase glycerol conversion to allyl alcohol

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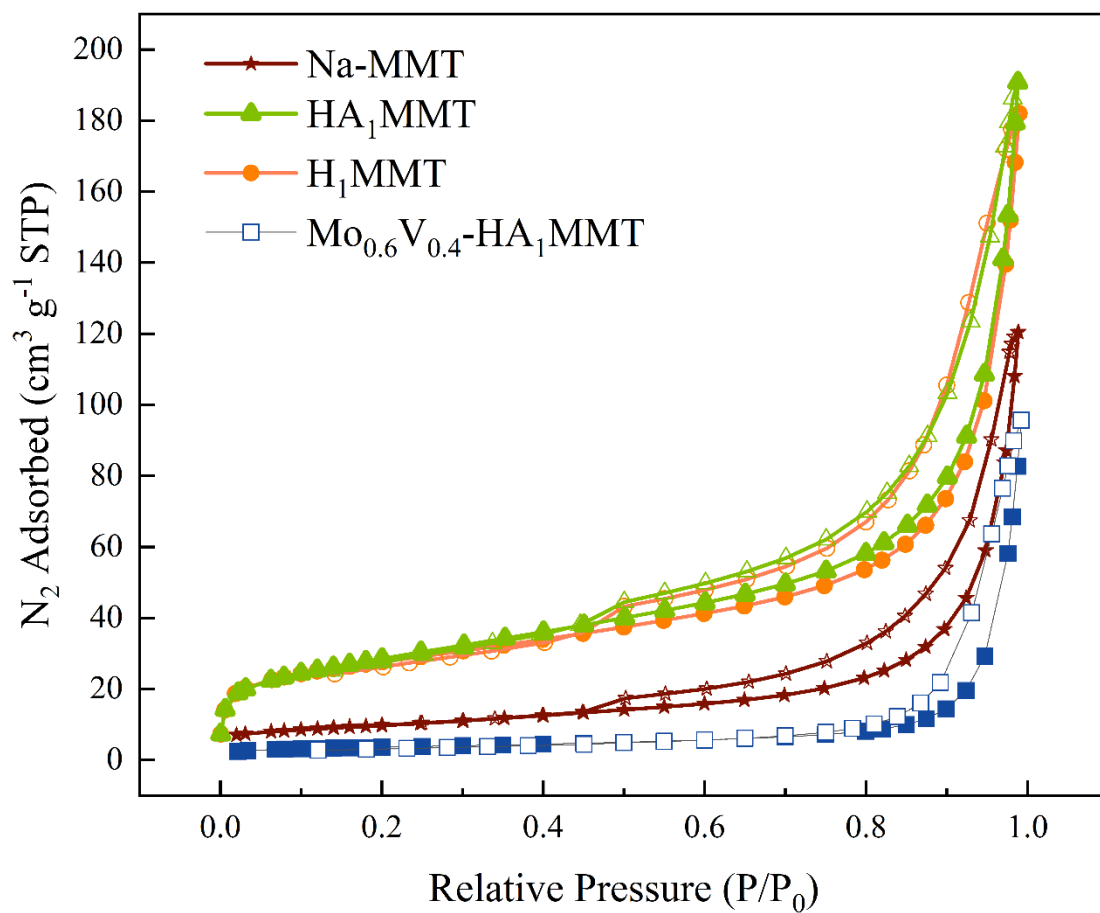


Figure S1. The nitrogen isotherms of the prepared catalysts

Table S1. Peak retention time of the sample to be tested

| Sample | Peak retention time (min) |
|-----------------|---------------------------|
| Acetaldehyde | 2.00~2.10 |
| Acrolein | 2.75~2.85 |
| Methanol | 3.05~3.15 |
| Ethanol | 3.60~3.70 |
| Allyl alcohol | 6.70~6.80 |
| Acetone alcohol | 11.20~11.30 |
| 1,2-propanediol | 17.30~17.40 |
| 1,3-propanediol | 18.10~18.20 |
| Glycerol | 30.80~31.15 |

Note: Detector: Column model: FFAP (30 m × 0.32 mm × 0.5 μm); Gasification chamber temperature: 300 °C; Injection volume: 1 μL; Column flow rate: 12 mL/min; Split ratio: 40:1 (The peak retention time of the sample was obtained by GC testing using a 1% standard solution)

Table S2. Performance comparison of the reported catalysts in the conversion of glycerol to allyl alcohol

| Catalysts | Conv. (%) | Sel. Allyl Alcohol (%) | S _{BET} (m ² g ⁻¹) | Acid site concentration (mmol/g) | References |
|---|-----------|------------------------|--|----------------------------------|------------|
| Ca _{0.5} Mg _{0.5} (7)-Cat. | 81.0 | 46.2 | / | 0.214 | This study |
| Mo/KIT-6 ^a | 98.7 | 16.6 | 433.3 | 0.231 | 1 |
| Fe/KIT-6 ^a | 74.7 | 5.6 | 515.0 | 0.135 | |
| MoFe0.3/KIT-6 | 94.0 | 26.8 | 457.9 | 0.225 | |
| ZrO ₂ -FeO _x | 100.0 | 13.7 | / | / | 2 |
| MoFe-N | 71.3 | 14.6 | 6.27 | 0.314 | 3 |
| MoFe/c-CeO ₂ | 71.7 | 22.9 | 23.2 | 0.148 | |
| MoFe/p ₁ -CeO ₂ | 81.0 | 24.5 | 20.5 | 0.234 | |
| MoFe/p ₂ -CeO ₂ | 97.1 | 23.3 | 41.8 | 0.339 | |
| H-ZSM-5/Fe/Rb | 99.9 | 11.9 | / | / | 4 |
| CoFe11-ZIF-R | 89.7 | 68.7 | / | 0.105 | 5 |
| CuMoAl | ~82 | 15% | 159 | / | 6 |
| Mo ₈ V ₂ .Ca ₂ MMT | 86.5 | 31.6 | / | / | 7 |
| BEA/Cs/V | 20 | 30 | 496 | | 8 |

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