catalysts

Supporting Information

Hierarchical H-MOR Zeolite Supported Vanadium Oxide for Dimethyl Ether Direct Oxidation

Wenfeng Wang [1,2], Xiujuan Gao [1,2], Ru Feng [1,2], Qi Yang [1,2], Tao Zhang [1], Junfeng Zhang [1], Qingde Zhang [1,*], Yizhuo Han [1] and Yisheng Tan [1,*]

[1] State key Laboratory of Coal Conversion, Institute of Coal Chemistry, Chinese Academy of Sciences, Taiyuan 030001, China

[2] University of Chinese Academy of Sciences, Beijing 100049, China

* Correspondence: qdzhang@sxicc.ac.cn (Q.Z.); tan@sxicc.ac.cn (Y.T.); Tel: +86-351-4044-388 (Q.Z.); +86-351-4044-287 (Y.T.)

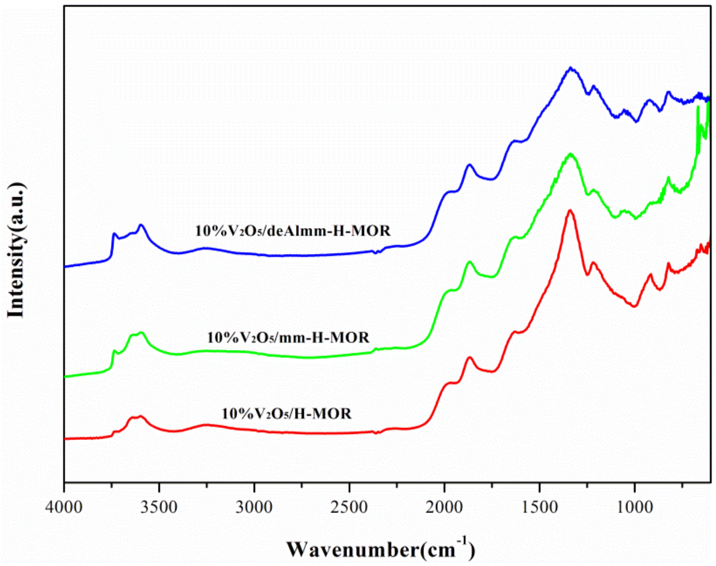

Figure S1. FT-IR spectra of vanadium oxide supported on post-synthesis H-MOR zeolites.

Table S1 Relative peak areas determined from ^{27}Al MAS NMR

Catalysts	CS(ppm)	I(%)	CS(ppm)	I(%)
10%V_2O_5/H-MOR	55	83.8	0	16.2
10%V_2O_5/mm-H-MOR	55	86.5	0	13.5
10%V_2O_5/deAlmm-H-MOR	55	89.3	0	10.7

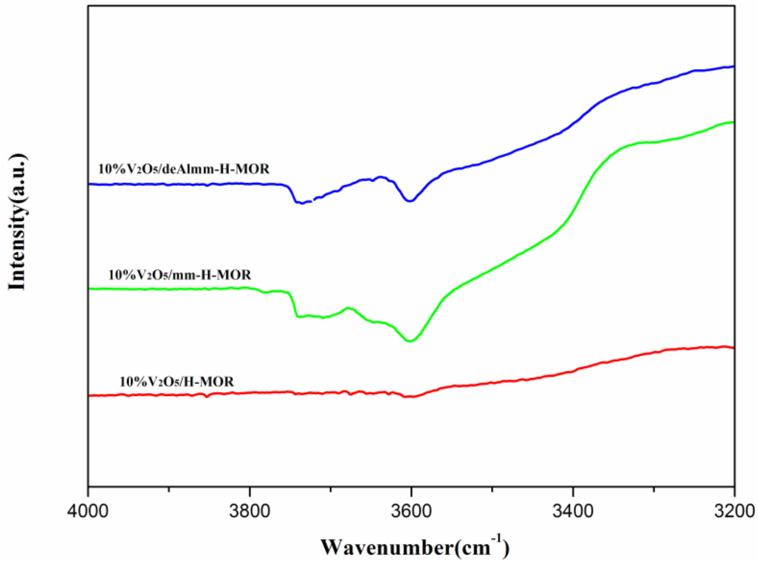

Figure S2. FT-IR spectra of adsorption of NH_3 on different catalysts with details of the OH region.

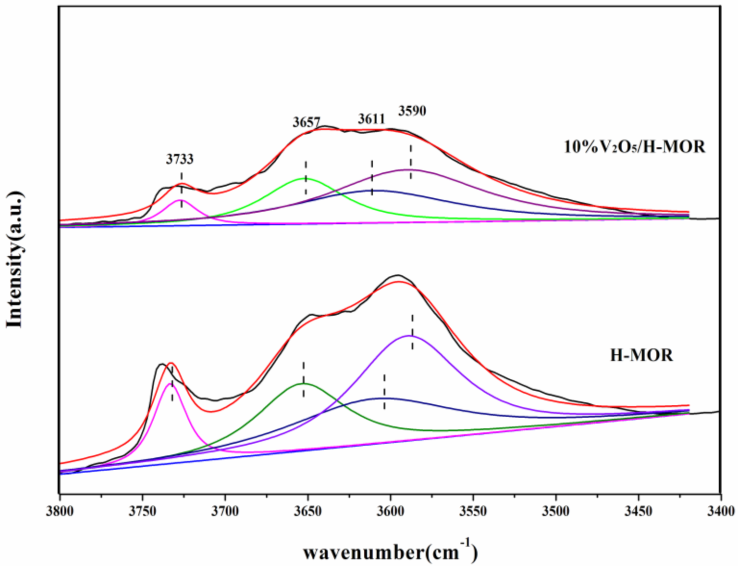

Figure S3. FT-IR spectra of the OH stretching region of the 10% V_2O_5/H-MOR and H-MOR.

The relative numbers of protons in the 8-MR and 12-MR channels were determined by the deconvolution of the OH groups in FT-IR spectra; the bands at 3590 cm^{-1} and 3611 cm^{-1} are assigned to the 8-MR and 12-MR, respectively. The result shows that about 60% of the acid sites are located in 8-MR.

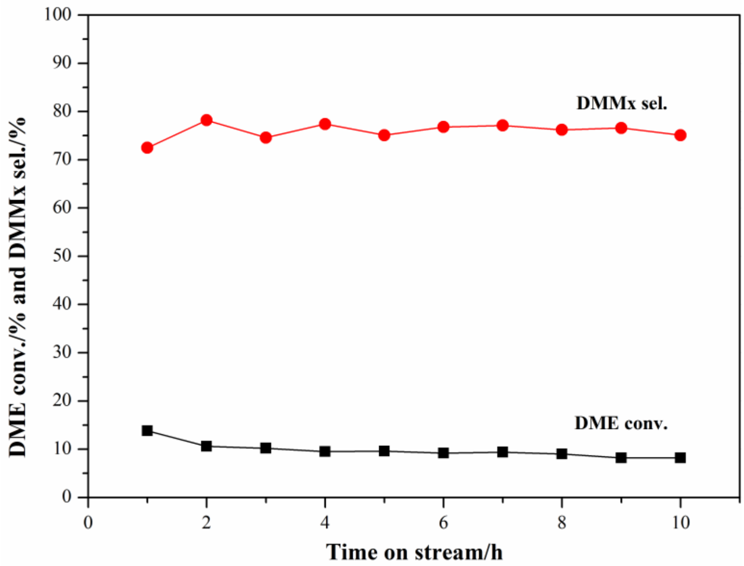

Figure S4. Catalytic performance of DME direct oxidation to DMMx over 10%V_2O_5/deAlmm-H-MOR during 10h on stream at the conditions of 503K, atmospheric pressure, O_2/DME molar ratio = 1, and GHSV of 3600 h^{-1}.