

Supplementary data

Soot Oxidation in a Plasma-Catalytic Reactor: A Case Study of Zeolite-Supported Vanadium Catalysts

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1. Textural properties of the zeolite support

Table S1. Textural properties of the zeolite support.

Samples	Specific surface area ($\text{m}^2\cdot\text{g}^{-1}$)	Pore volume ($\text{cm}^3\cdot\text{g}^{-1}$)	Pore diameter (nm)	$\text{O}_{\text{ads}}/(\text{O}_{\text{ads}} + \text{O}_{\text{latt}})$ (%)
MCM-41	828	0.80	3.6	58.3
Mordenite	397	0.25	2.4	55.4
USY	645	0.44	2.5	54.7
5A	383	0.34	3.8	52.9

2. SEM images of the V/M catalysts

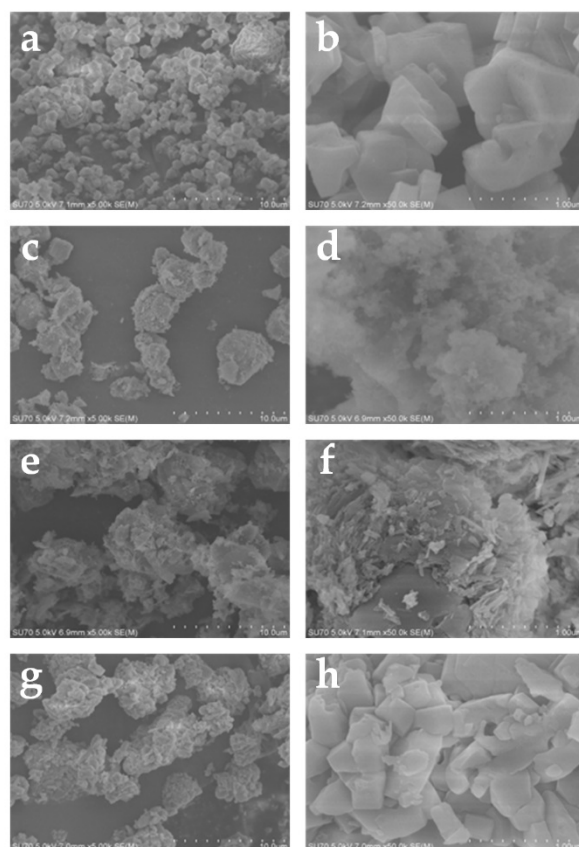


Figure S1. SEM images of the V/M catalysts: (a) and (b) V/MCM-41; (c) and (d) V/Mordenite; (e) and (f) V/USY; (g) and (h) V/5A. Left column: with a magnitude of 5.0 k, right column: with a magnitude of 50.0 k.

3. XRD patterns of the zeolite support

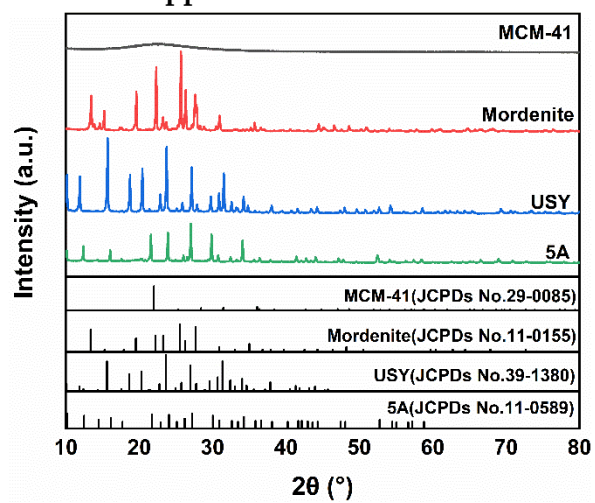


Figure S2. XRD patterns of the zeolite supports.

4. XPS spectra of the zeolite supports

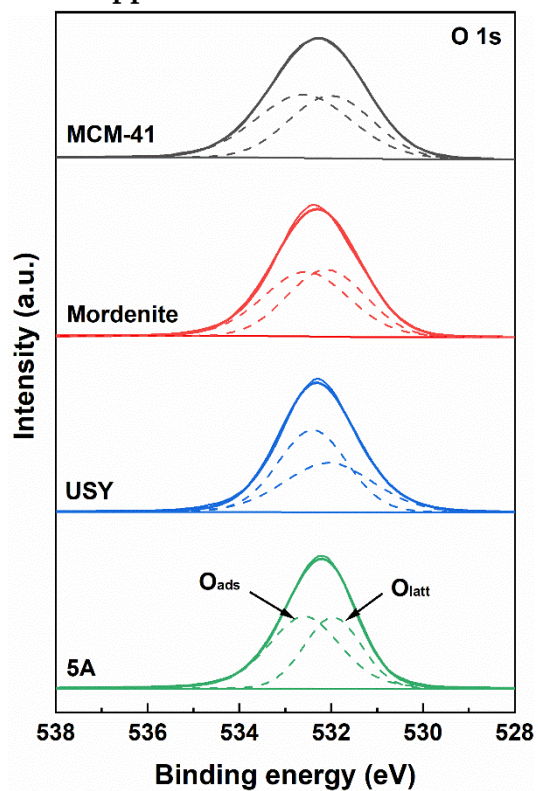


Figure S3. O 1s spectra of all zeolite supports.

5. Calculation of energy efficiency of the plasma-catalytic soot oxidation process

The energy efficiency of the plasma-catalytic soot oxidation process was defined as follows:

$$m_{soot} = \frac{G \times \int_0^t (C_{CO} + C_{CO_2}) dt}{V_m} \times M_C \quad (S1)$$

$$Energy\ efficiency\ (g \cdot kWh^{-1}) = \frac{m_{soot}}{P_d \times t} \quad (S2)$$

where m_{soot} is the weight of oxidized soot, G is the total flow rate, V_m is the gas molar volume under experiment condition, M_C is the molar mass of carbon, t is the duration for plasma-catalytic soot oxidation, P_d is the discharge power, C_{CO} and C_{CO_2} are the concentrations of outlet CO and CO₂, respectively.