

Supporting Information for

## **Enhancing metal dispersion over Mo/ZSM-5 catalyst for Methane dehydroaromatization**

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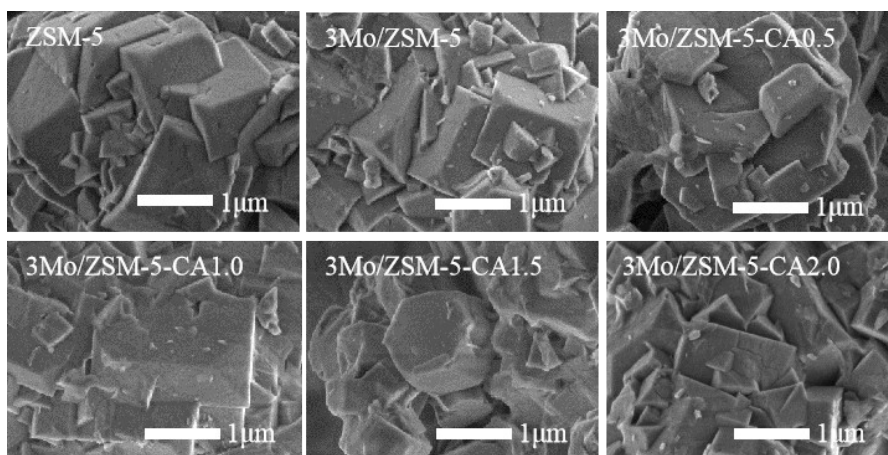


Fig. S1 SEM images of (a) ZSM-5, (b) 3Mo/ZSM-5, (c) 3Mo/ZSM-5-CA0.5, (d) 3Mo/ZSM-5-CA1.0, (e) 3Mo/ZSM-5-CA1.5 and (f) 3Mo/ZSM-5-CA2.0.

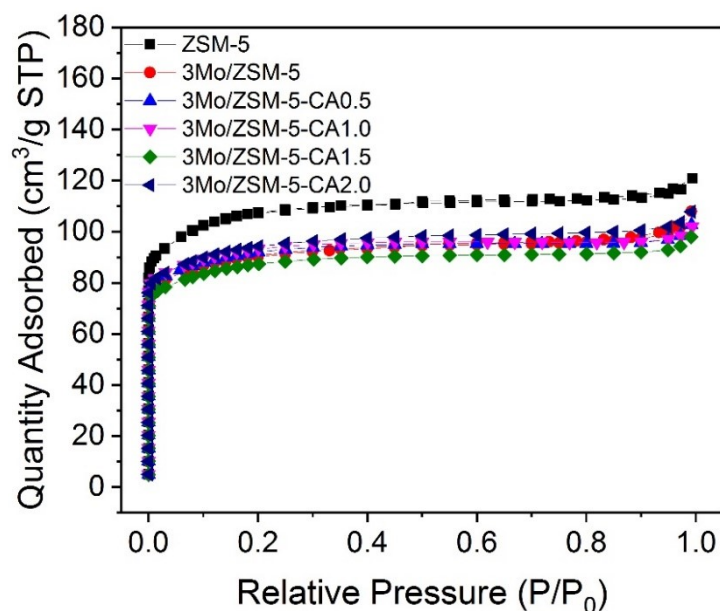


Fig. S2 N<sub>2</sub>-physorption isotherms of ZSM-5, 3Mo/ZSM-5, 3Mo/ZSM-5-CA0.5, 3Mo/ZSM-5-CA1.0, 3Mo/ZSM-5-CA1.5 and 3Mo/ZSM-5-CA2.0.

Table S1 Textural properties and relative crystallinity of the samples

Samples	$S_{\text{BET}}^{\text{a}}$ ( $\text{m}^2 \cdot \text{g}^{-1}$ )	$S_{\text{micro}}^{\text{b}}$ ( $\text{m}^2 \cdot \text{g}^{-1}$ )	$V_{\text{micro}}^{\text{b}}$ ( $\text{cm}^3 \cdot \text{g}^{-1}$ )	$V_{\text{total}}$ ( $\text{cm}^3 \cdot \text{g}^{-1}$ )	Relative crystallization
ZSM-5	331	224	0.12	0.19	100%
3Mo/ZSM-5	285	198	0.10	0.16	91%
3Mo/ZSM-5-CA0.5	283	197	0.10	0.16	95%
3Mo/ZSM-5-CA1.0	285	202	0.11	0.16	95%
3Mo/ZSM-5-CA1.5	268	186	0.10	0.15	98%
3Mo/ZSM-5-CA2.0	290	197	0.11	0.17	91%

<sup>a</sup> BET surface area

<sup>b</sup> t-plot method

Table S2 Band gap energy of samples

Samples	$\lambda_g$ (nm)	$E_g$ (eV)
3Mo/ZSM-5	395	3.14
3Mo/ZSM-5-CA0.5	390	3.18
3Mo/ZSM-5-CA1.0	388	3.20
3Mo/ZSM-5-CA1.5	384	3.23
3Mo/ZSM-5-CA2.0	387	3.20

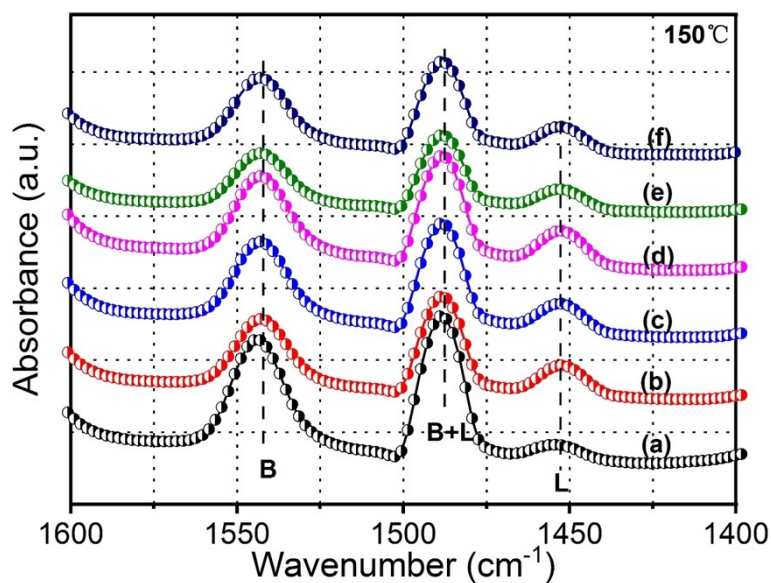


Fig. S3 Py-IR profiles of (a) ZSM-5, (b) 3Mo/ZSM-5, (c) 3Mo/ZSM-5-CA0.5, (d) 3Mo/ZSM-5-CA1.0, (e) 3Mo/ZSM-5-CA1.5 and (f) 3Mo/ZSM-5-CA2.0 (150°C).

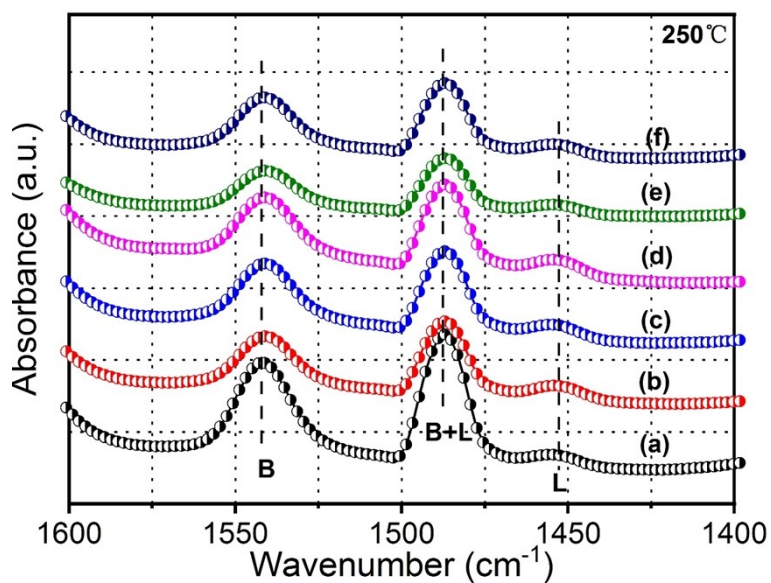


Fig. S4 Py-IR profiles of (a) ZSM-5, (b) 3Mo/ZSM-5, (c) 3Mo/ZSM-5-CA0.5, (d) 3Mo/ZSM-5-CA1.0, (e) 3Mo/ZSM-5-CA1.5 and (f) 3Mo/ZSM-5-CA2.0 (250°C).

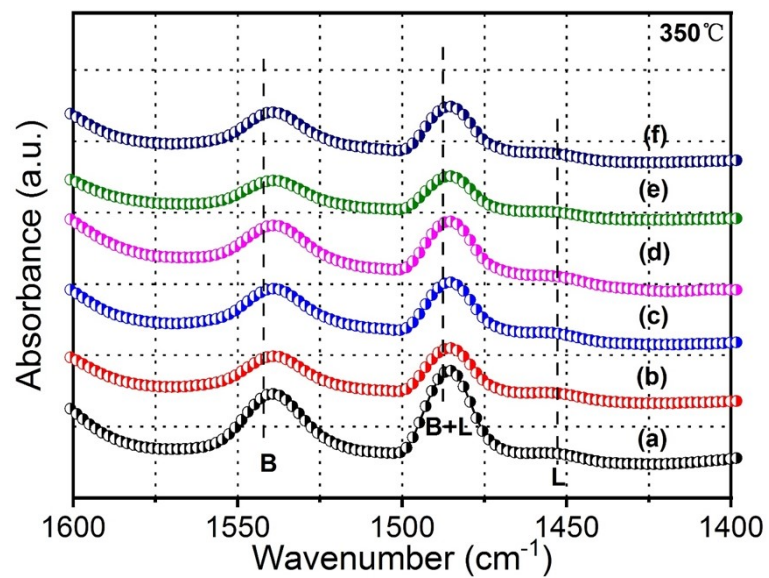


Fig. S5 Py-IR profiles of (a) ZSM-5, (b) 3Mo/ZSM-5, (c) 3Mo/ZSM-5-CA0.5, (d) 3Mo/ZSM-5-CA1.0, (e) 3Mo/ZSM-5-CA1.5 and (f) 3Mo/ZSM-5-CA2.0 (350°C).