

**Promotional effect of Sn additive on the chlorine resistance over SnMnOx/LDO
catalysts for synergistic decomposition of NOx and *o*-DCB**

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Contents

1. Supplementary Figures

2. Supplementary Tables

1. Supplementary Figures

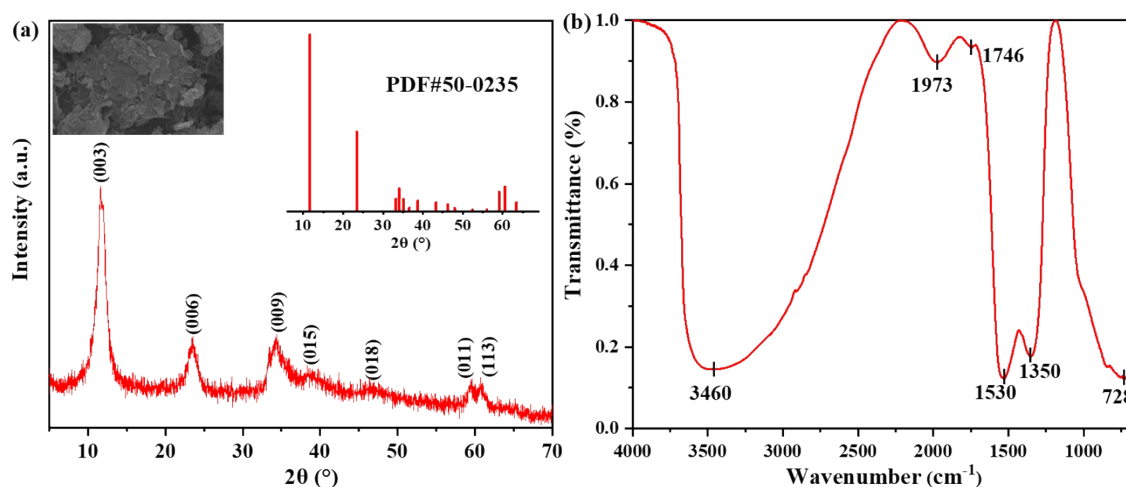


Fig. S1. (a) XRD pattern and SEM image (inset) of CoFe-LDH precursors, (b) FTIR spectrum of CoFe-LDH precursors.

The CoFe-LDH precursors were characterized by XRD, SEM and FTIR to determine the successful synthesis of hydrotalcite-like structures, and the results are presented in **Fig. S1**. The XRD pattern of the sample are consistent with that of the standard card (PDF# 50-0235), and the bands at 11.6, 23.4, 34.3, 38.7, 46.3, 59.6 and 60.8° are attributed to the characteristic peaks of CoFe-LDH¹. The SEM image shows that CoFe-LDH is stacked in unevenly sized lamellae, which conforms to the characteristics of hydrotalcite-like structure morphology¹. In **Fig. S1(b)**, the broad absorption peak at 3460 cm^{-1} corresponds to the stretching vibration of hydroxyl groups from hydroxide and interlayer water molecules². The peak observed at 1530 cm^{-1} belongs to the angular deformation vibration of H_2O molecules, and the peak at 1350 cm^{-1} is ascribed to the C-O antisymmetric stretching vibration of carbonate ions³. The adsorption band around 728 cm^{-1} are attributed to the vibrations of the M-O bond (M-OH, M-O-M or O-M-O)⁴. The results above confirmed the successful synthesis of the CoFe-LDH precursors.

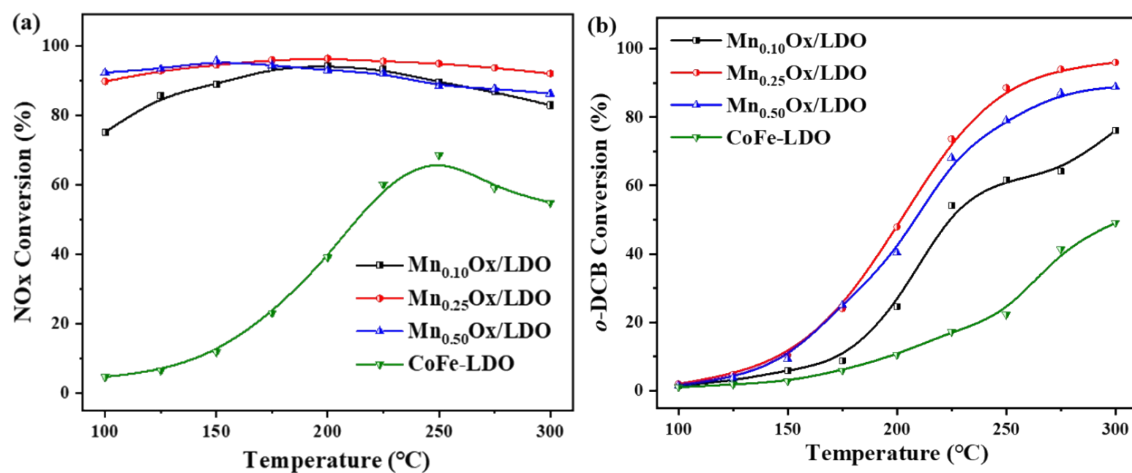


Fig. S2. Catalytic activities of Mn_bOx/LDO with different Mn mass loading and CoFe-LDO, (a) NO_x conversion and (b) *o*-DCB conversion.

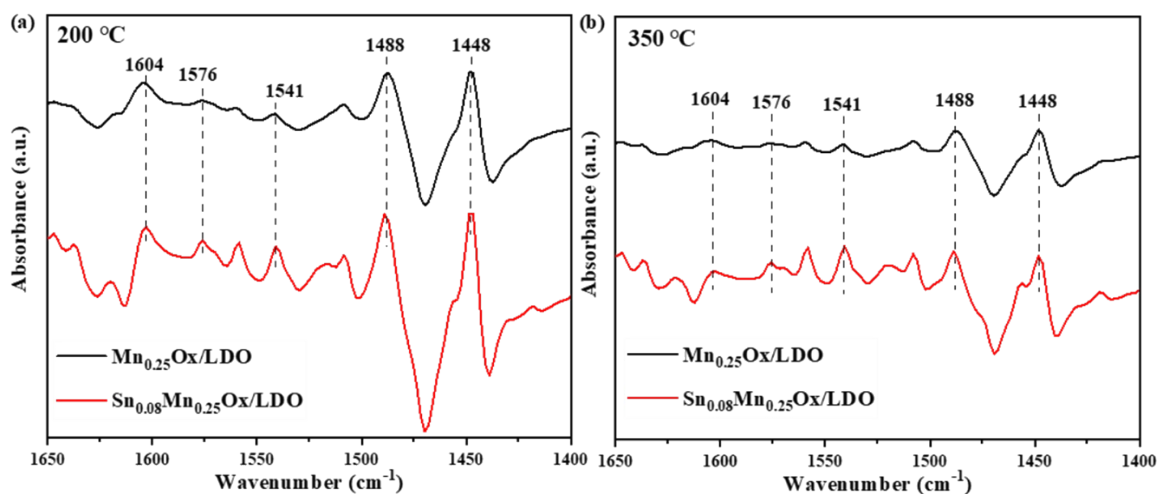


Fig. S3. FTIR spectra of pyridine adsorbed on the surface of Mn_{0.25}Ox/LDO and Sn_{0.08}Mn_{0.25}Ox/LDO catalysts at (a) 200 °C and (b) 350 °C.

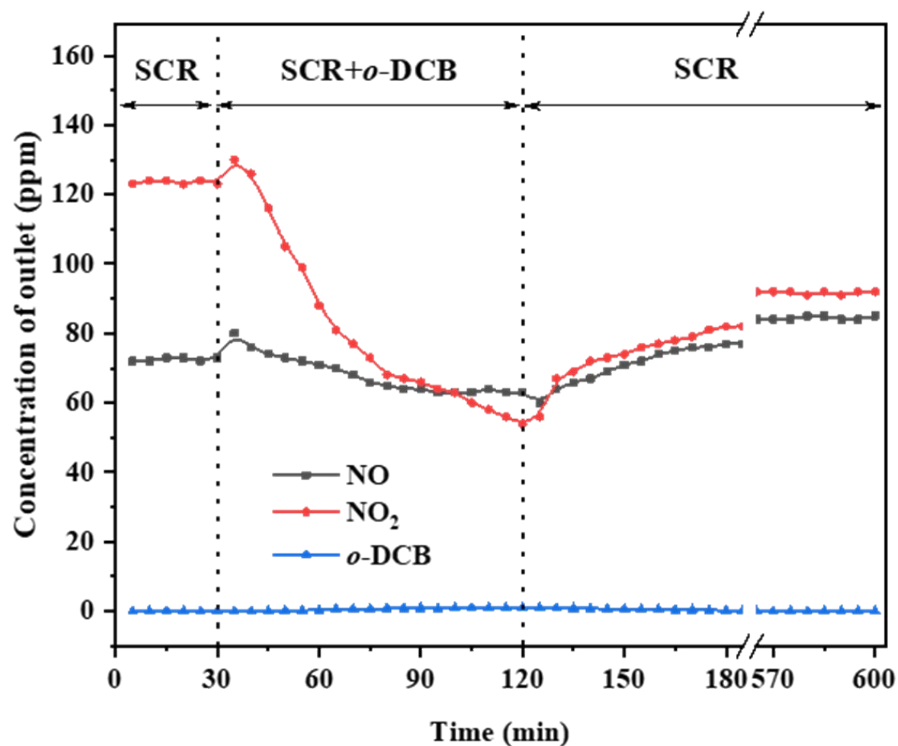


Fig. S4. Transient reaction on $\text{Sn}_{0.08}\text{Mn}_{0.25}\text{Ox/LDO}$ catalyst at 300 °C for the effect of *o*-DCB on the SCR reaction.

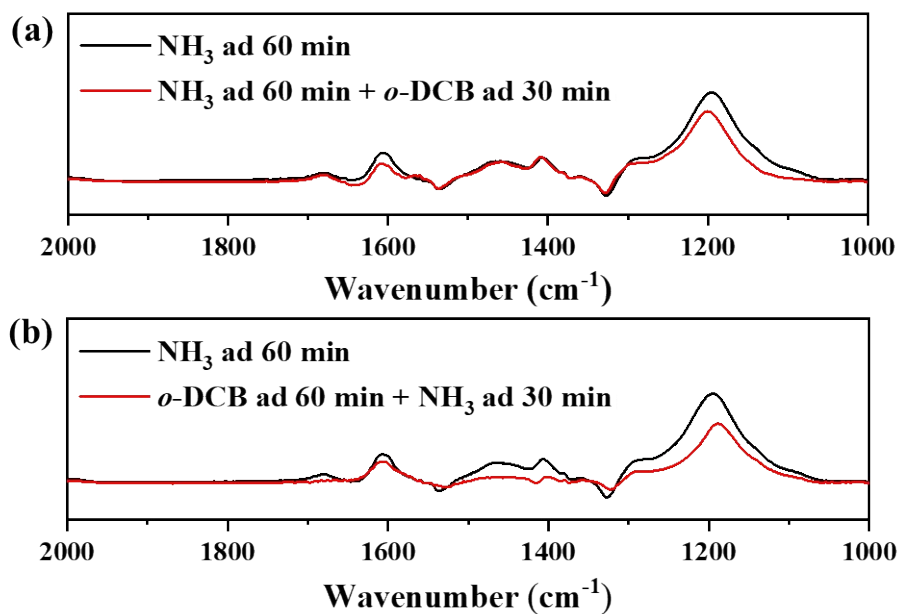


Fig. S5. In situ DRIFTS spectra of (a) NH_3 adsorption at 60 min and pre-adsorbed NH_3 + *o*-DCB adsorption at 30 min, (b) NH_3 adsorption at 60 min and pre-adsorbed *o*-DCB + NH_3 adsorption at 30 min.

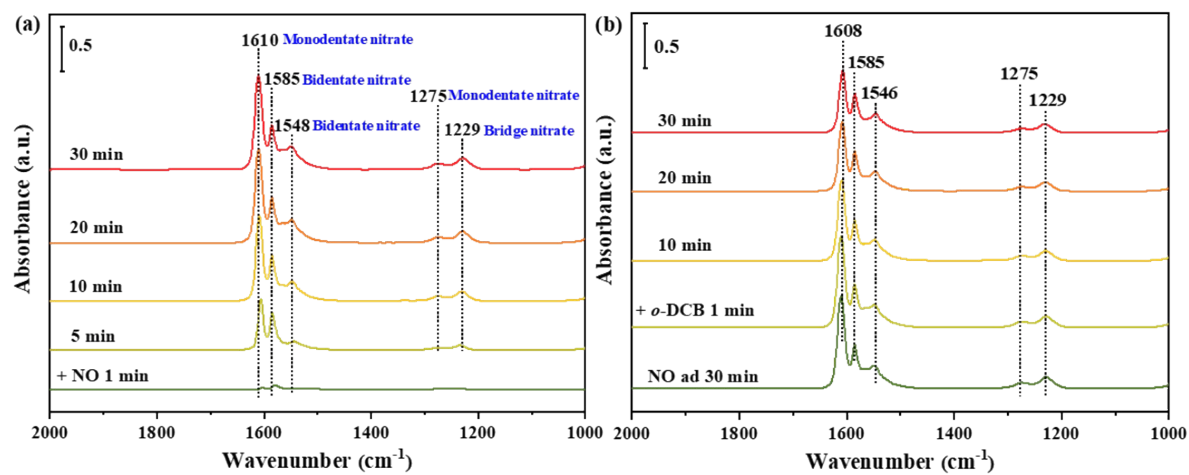


Fig. S6. In situ DRIFTS spectra of $\text{Sn}_{0.08}\text{Mn}_{0.25}\text{Ox/LDO}$ catalyst exposed to (a) NO and (b) followed by exposure to *o*-DCB for various time at 150 °C.

2. Supplementary Tables

Table S1. Quantitative results of the O₂-TPD, H₂-TPR, NH₃-TPD and Py-FTIR.

Catalysts	Amount of O ₂ desorption (mmol/g)	H ₂ consumption (mmol/g)	Amount of NH ₃ desorption (mmol/g)	The ratios of B/L ^a	
				200 °C	350 °C
Fresh-Mn _{0.25} Ox/LDO	0.34	0.72	0.79	0.08	0.10
Used-Mn _{0.25} Ox/LDO	/	0.78	1.89	/	
Fresh-Sn _{0.08} Mn _{0.25} Ox/LDO	0.36	0.72	1.29	0.17	0.29
Used-Sn _{0.08} Mn _{0.25} Ox/LDO	/	0.73	1.43	/	
CoFe-LDO	0.45	0.88	0.85	/	

^a Calculated from Py-FTIR data.

Reference

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