Supporting Information

Exceptional high and reversible NO_x uptake by hollow Mn-Fe composite nanocubes derived from Prussian blue analogue

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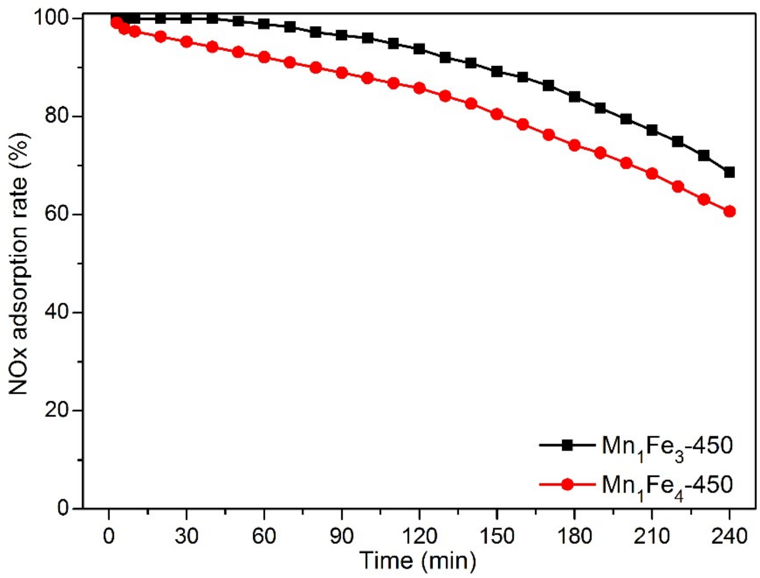

Fig. S1 NO_x adsorption rate on Mn_1Fe_3-450 and Mn_1Fe_3-450 at 200 °C.

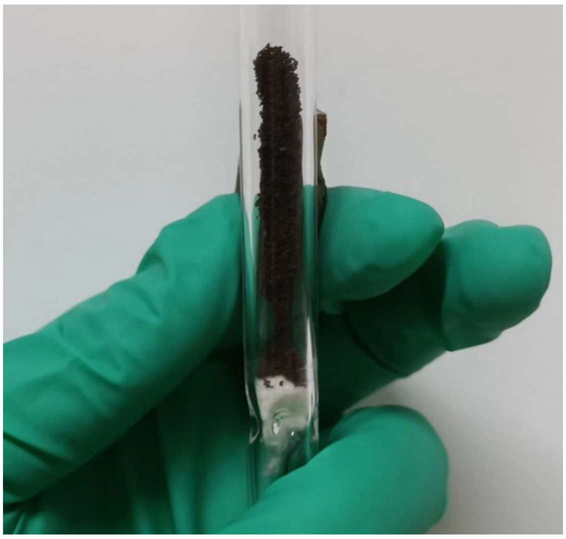

Fig. S2 Image of the prepared sample absorbed by a magnet.

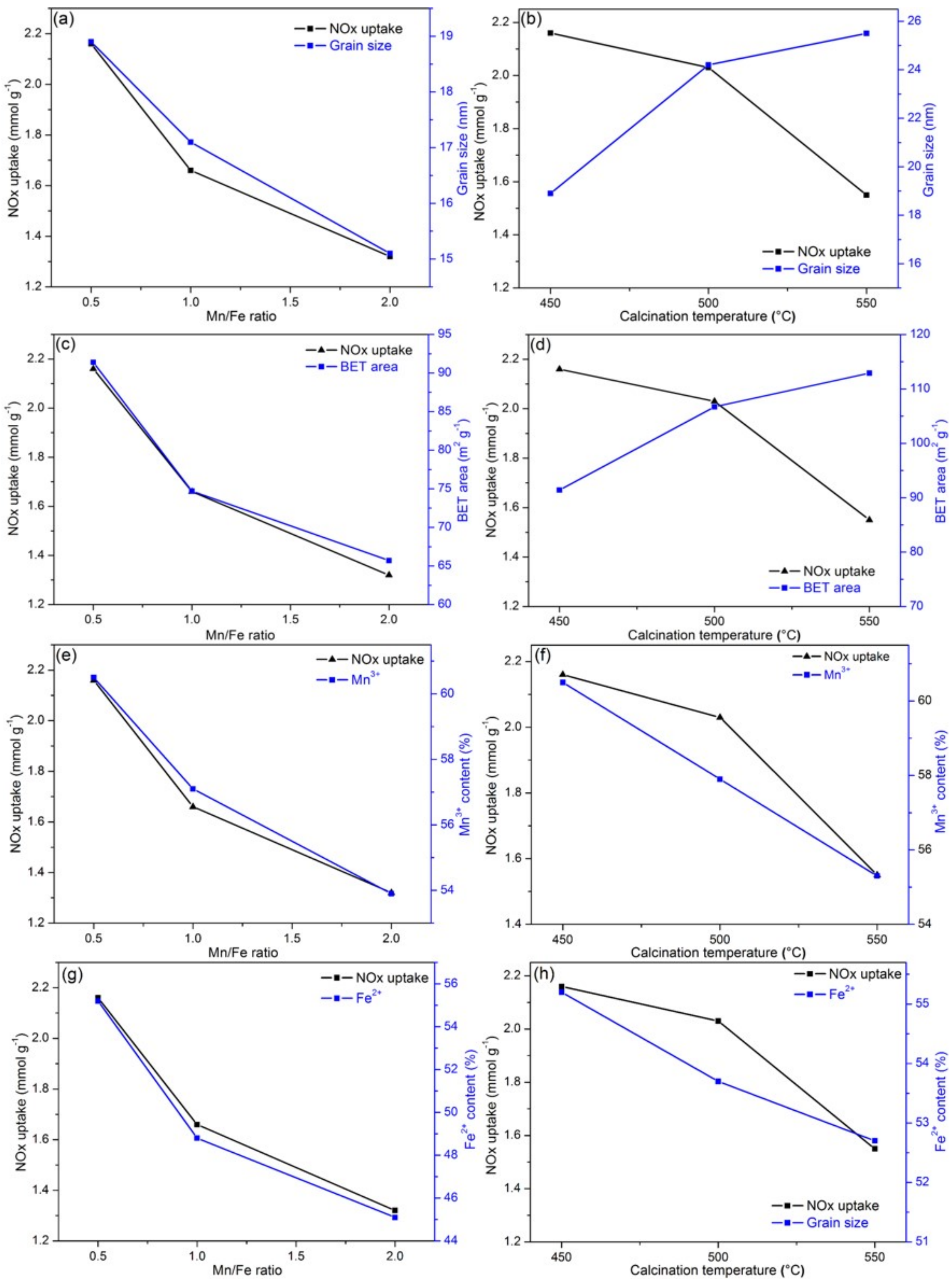

Fig. S3 The correlation of NOx adsorption capacity with (a), (b) grain size, (c), (d) BET specific surface area, (e), (f) Mn^{3+} content and (g), (h) Fe^{2+} content of Mn_xFe_y-T (mole ratio x/y=1:2, 1:1, 2:1, T is the calcination temperature, 450, 500, 550 °C).

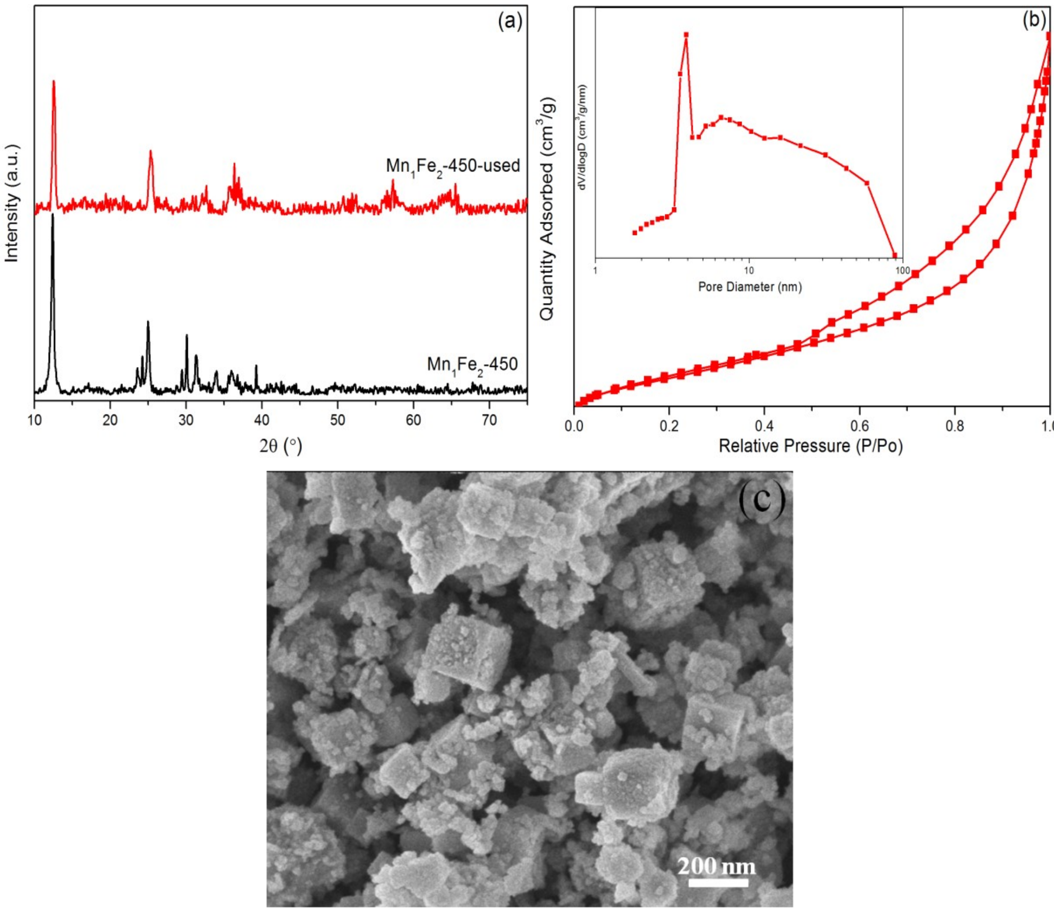

Fig. S4 (a) XRD curve and (b) N_2 adsorption-desorption isotherms and pore size distribution (inset), and (c) SEM of the Mn_1Fe_2-450-used.

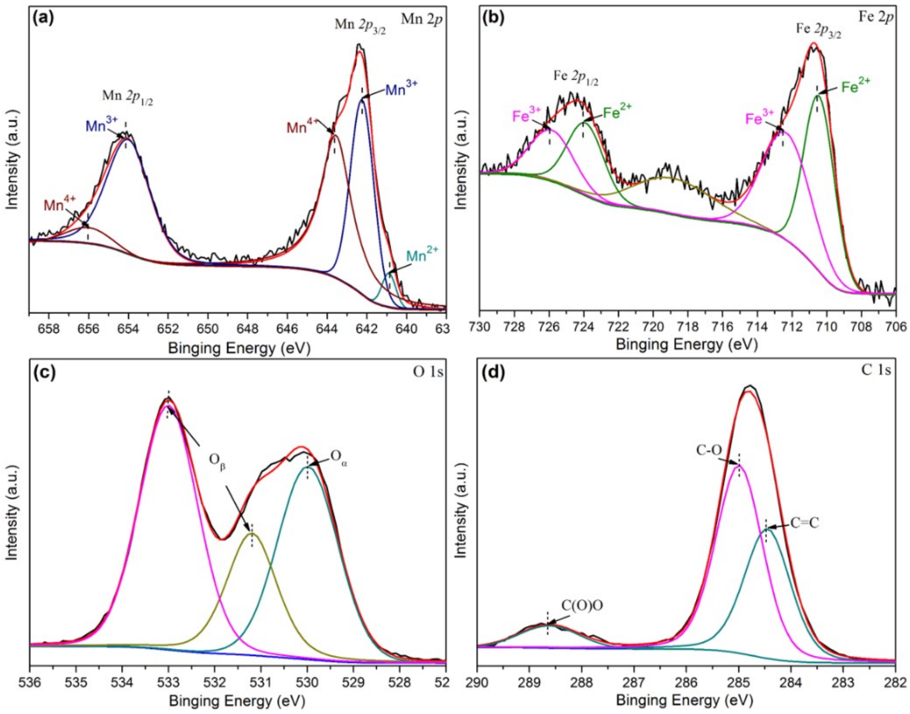

Fig. S5 (a) Mn 2p, (b) Fe 2p, (c) O 1s and (d) C 1s XPS spectra of the Mn_1Fe_2-450-used.

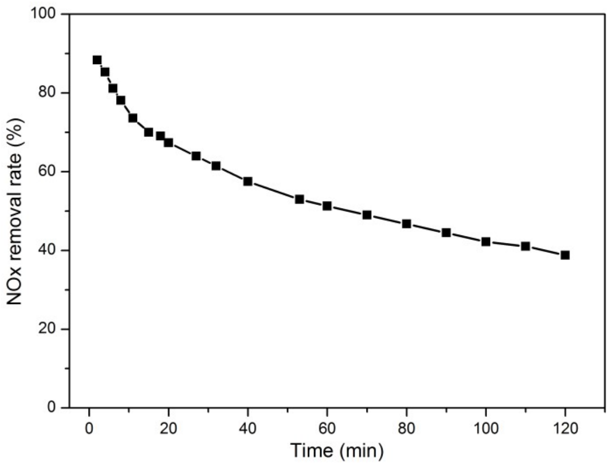

Fig. S6 The NOx adsorption rate of the Fe_1Fe_2-450 sample.

Table S1. The NO_x uptakes of different literature-reported adsorbents.

Adsorbent	Reaction condition	NOx uptake (mmol g^{-1})	Ref.
Mn_1F_2-450	500 ppm NO + 5% O_2 (200 °C)	2.16	This work
Pt-Ba/γ-Al_2O_3	100 ppm NO + 3% O_2 (250 °C)	0.379	[1]
15 wt%K_2CO_3/$Co_1Mg_2AlO_x$	100 ppm NO + 10% O_2 (300 °C)	1.04	[2]
Pt/Ba/Al_2O_3	1000 ppm NO + 3% O_2 (350 °C)	0.56	[3]
Pt-15% K_2CO_3/ZrO_2	400 ppm NO + 5% O_2 (350 °C)	2.16	[4]
4%K_2CO_3/Co-Mg-Al	400 ppm NO + 10% O_2 (250 °C)	2.63	[5]

[1] L. Lietti, P. Forzatti, I. Nova, E. Tronconi, NOx storage reduction over Pt-Ba/γ-Al_2O_3 catalyst, J. Catal. 204 (1) (2001) 175–191.

[2] R. Yang, Y. Cui, Q. Yan, C. Zhang, L. Qiu, D. O'Hare, Q. Wang, Design of highly efficient NOx storage-reduction catalysts from layered double hydroxides for NOx emission control from naphtha cracker flue gases, Chem. Eng. J. 326 (2017) 656–666.

[3] L. Castoldi, L. Lietti, I. Nova, R. Matarrese, P. Forzatti, F. Vindigni, S. Morandi, F. Prinetto, G. Ghiotti, Alkaline- and alkaline-earth oxides based lean NOx traps: effect of the storage component on the catalytic reactivity, Chem. Eng. J. 161 (3) (2010) 416–423,

[4] N. Hou, Y. Zhang, M. Meng, Carbonate-based lean-burn NOx trap catalysts Pt–K_2CO_3/ZrO_2 with large NOx storage capacity and high reduction efficiency, J. Phys. Chem. C 117 (8) (2013) 4089–4097,

[5] Y. Choi, K.B. Lee, Hydrothermal-treatment-based facile one-step preparation of K-promoted NOx adsorbents derived from hydrotalcite-like compounds, Chem. Eng. J. 410 (2021) 128241.

Table S2. The surface atomic content of the different samples.

Sample	Mn at. %	Fe at. %	K at. %	O at. %	N at. %	C at. %
Mn_1Fe_2-450	10.15	6.99	10.96	47.02	2.96	21.94
Mn_1Fe_1-450	9.38	5.02	13.07	45.1	4.07	23.35
Mn_2Fe_1-450	12.17	5.92	11.03	47.87	3.12	19.89
Mn_1Fe_2-500	4.39	2.83	18.09	49.7	8.95	16.04
Mn_1Fe_2-550	5.5	3.97	16.1	48.62	9.6	16.22
Mn_1Fe_2-450-used	3.02	2.94	16.38	39.64	8.31	29.71