Supporting Information

Ce-Mn Coordination Polymer Derived Hierarchical/Porous Structured CeO_2-MnO_x for Enhanced Catalytic Properties

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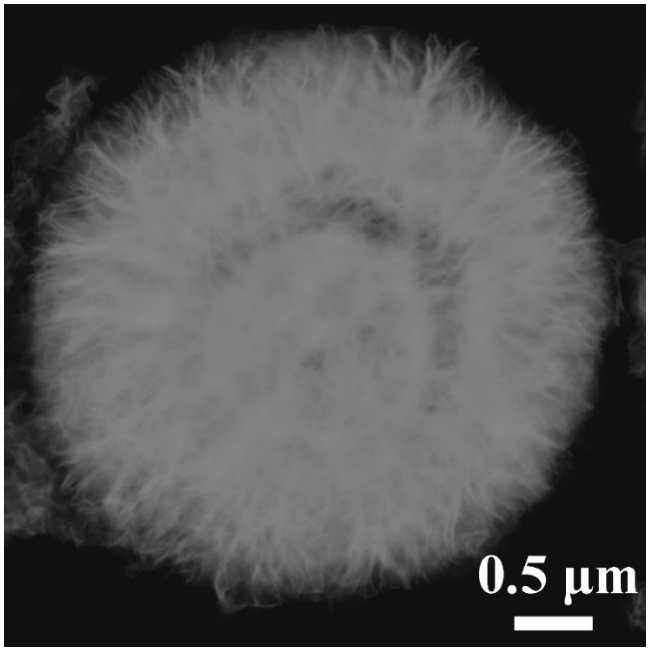

Fig. S1 HAADF-STEM image of CeO_2-MnO_x (5:5) catalyst.

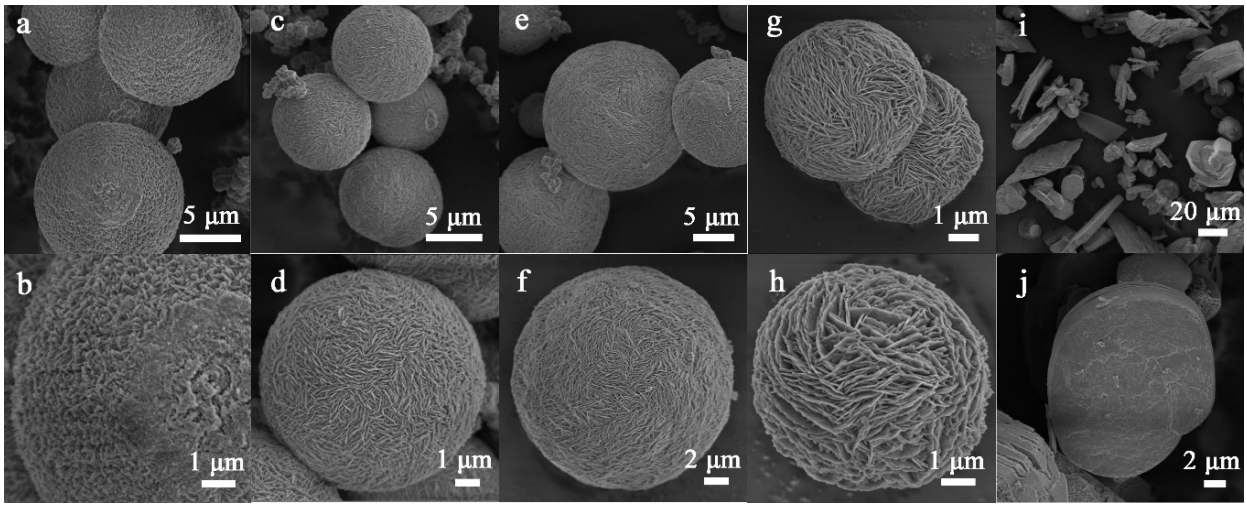

Fig. S2 SEM images of (a and b) Ce CPs, (c and d) Ce-Mn (7:3) CPs, (e and f) Ce-Mn (5:5) CPs, (g and h) Ce-Mn (3:7) CPs, and (i and j) Mn CPs.

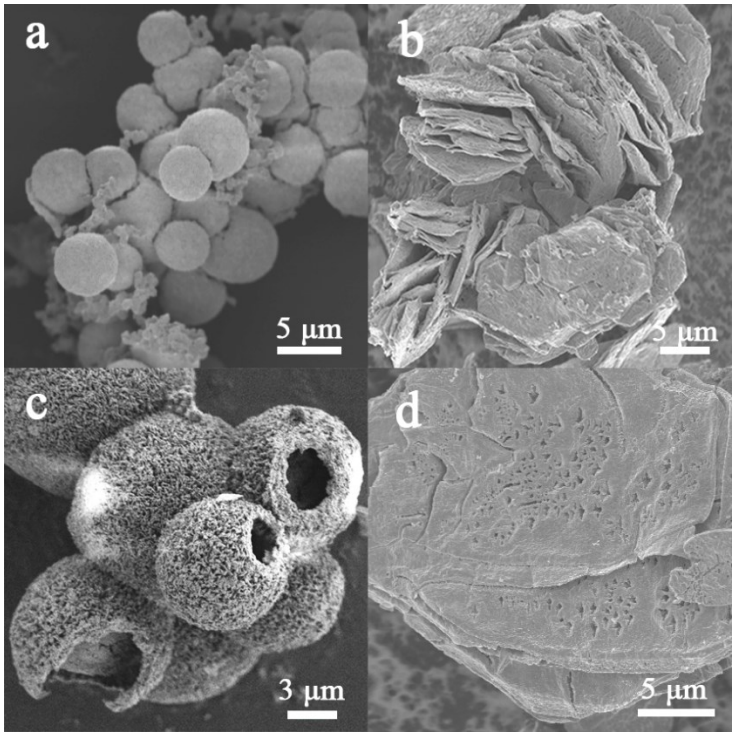

Fig. S3 SEM images of (a and c) CeO_2 and (b and d) MnO_x.

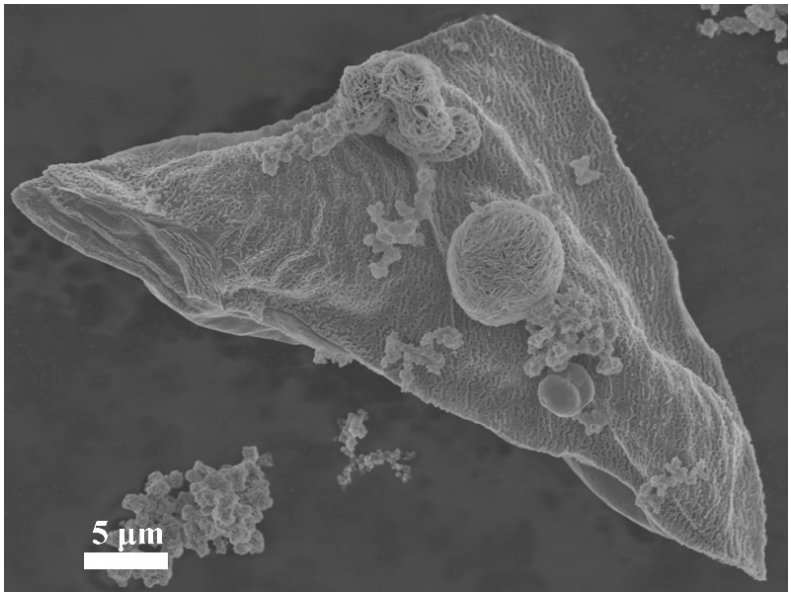

Fig. S4 SEM image of CeO_2-MnO_x (3:7) catalyst.

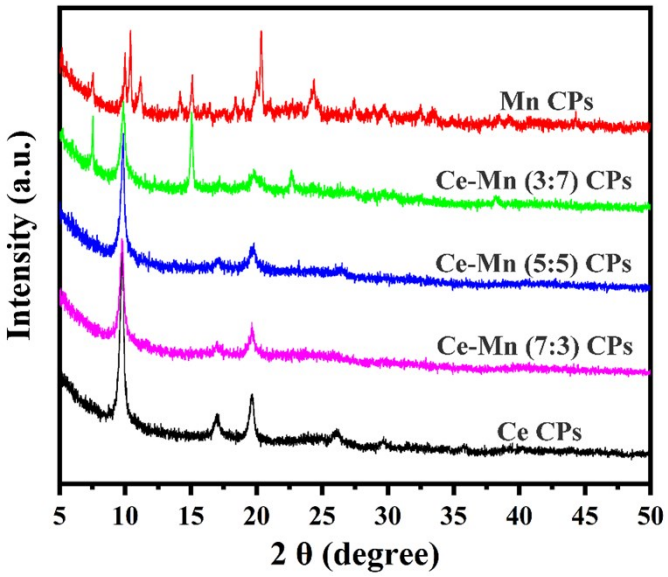

Fig. S5 XRD patterns of Ce CPs, Mn CPs, and Ce-Mn CPs with different ratios.

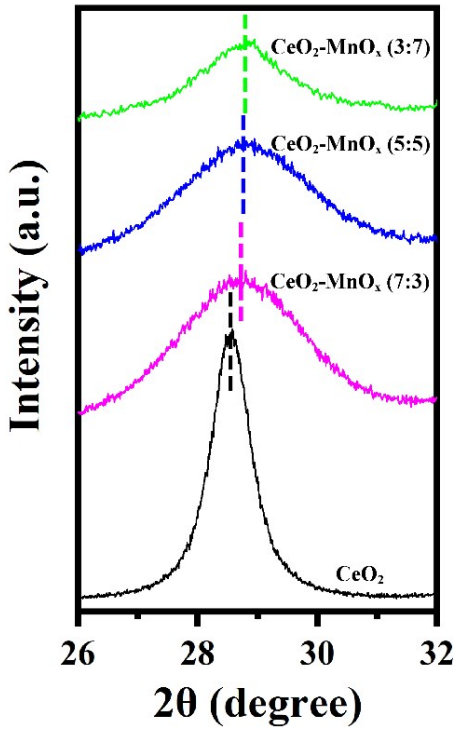

Fig. S6 The enlarged XRD patterns of CeO_2 (111) diffraction peak for CeO_2 and CeO_2-MnO_x catalysts with different ratios.

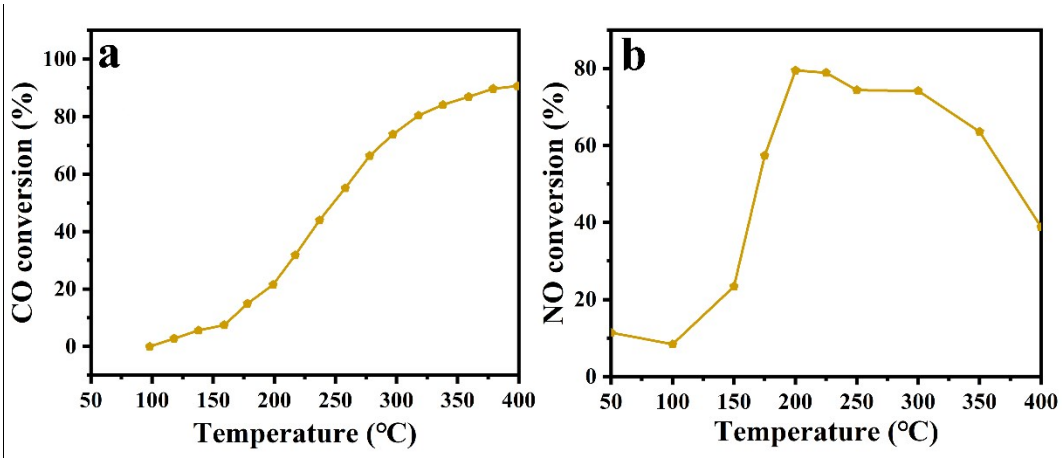

Fig. S7 CO conversion curve (a) and NO conversion curve (b) of CeO_2-MnO_x (5:5) prepared from impregnation method* under the same space velocity (60 000 and 120 000 $mL \cdot h^{-1} \cdot g^{-1}$ of catalyst for CO oxidation and SCR of NH_3, respectively)

* The CeO_2-MnO_x (5:5) catalyst was prepared by a traditional impregnation method. Typically, 200 mg of commercial CeO_2 was impregnated with an aqueous solution containing the desired amount of $Mn(NO_3)_2 \cdot 4H_2O$ for 2 h. Then, the resulting solid was heated at 100°C to evaporate residual water. Finally, the product was dried in an oven at 110°C for 12 h and calcined at 500°C for 5 h in air.

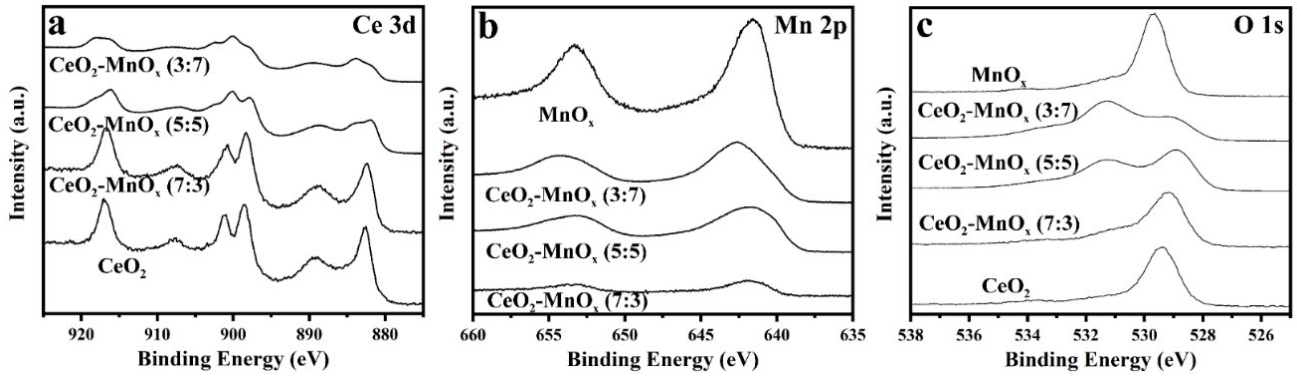

Fig. S8 The original XPS spectra of (a) Ce 3d; (b) Mn 2p and (c) O 1s of CeO_2, MnO_x and CeO_2-MnO_x catalysts with different ratios.

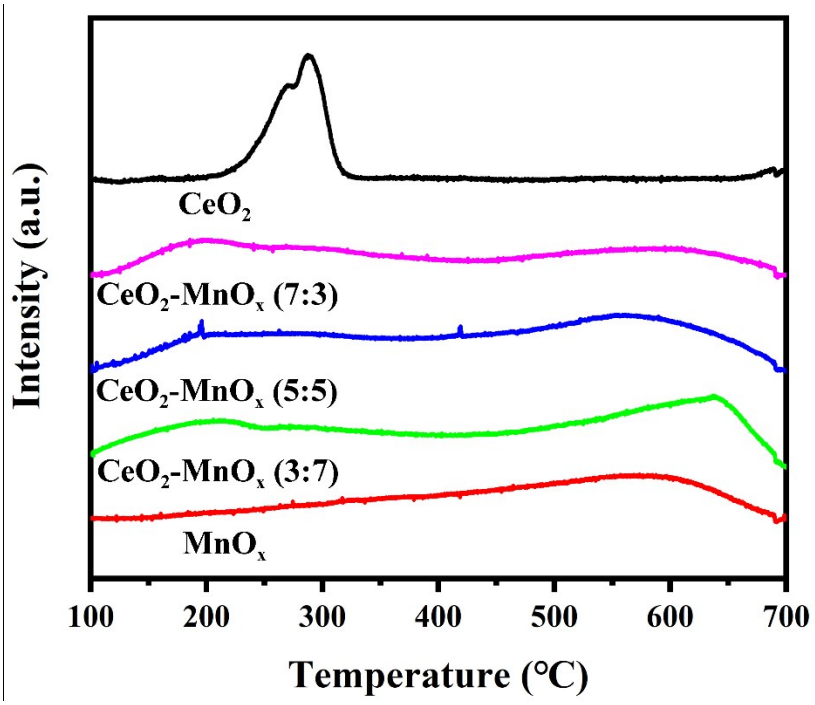

Fig. S9 NH_3-TPD profiles of CeO_2, MnO_x and CeO_2-MnO_x catalysts with different ratios.

Table S1. Crystallite size of CeO_2, porous structure parameters and molar ratios (by ICP-OES) of the CeO_2, MnO_x and CeO_2-MnO_x catalysts with different ratios.

Sample	Ce:Mn (mol/mol)	Crystallite size$^{\alpha}$ (nm)	S_{BET} (m^2/g)	Pore size (nm)	Pore volume (cm^3/g)
CeO_2	1:0	10.0	53.08	8.80	0.15
CeO_2-MnO_x (7:3)	7:2.99	4.1	83.46	8.28	0.21
CeO_2-MnO_x (5:5)	5:4.99	3.8	77.76	8.37	0.21
CeO_2-MnO_x (3:7)	3:7.92	5.0	70.81	9.68	0.22
MnO_x	0:1	-	27.47	13.80	0.14

α Calculated from the characteristic peak of CeO_2 (111) crystal face in the XRD patterns.