Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

Reasons behind the disintegration of the micro-spherical precursor $MnCO_3$ for soot combustion catalysts $Pt^{\delta+}/MnO_x$

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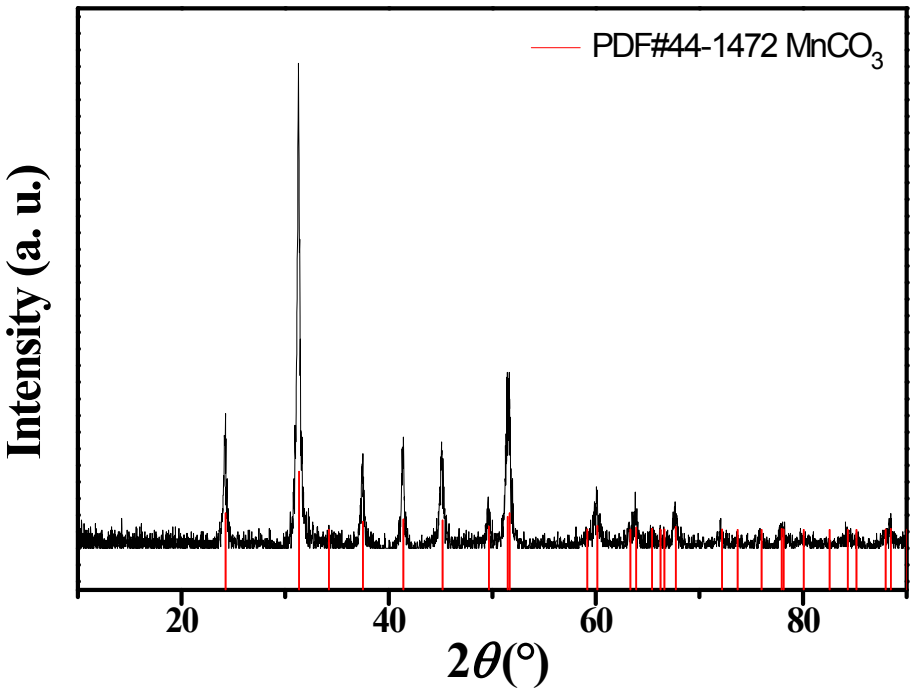

Fig. S1 XRD pattern of the precursor of MnOx, MnCO3.

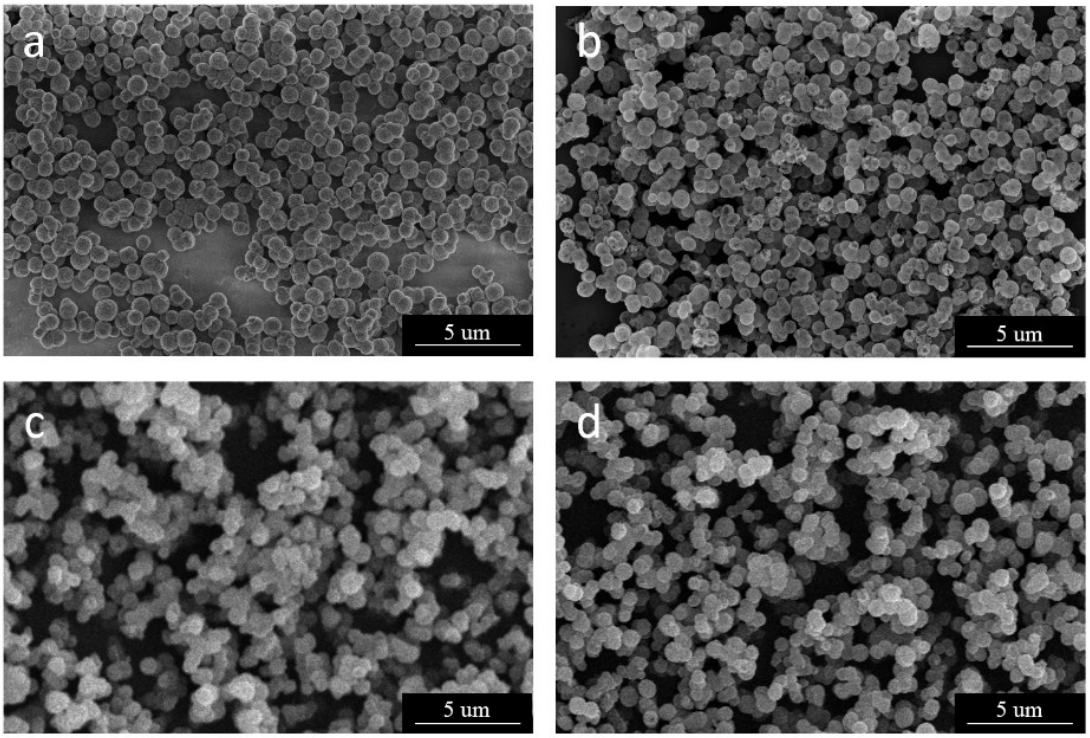

Fig. S2 SEM images of MnCO3, MnOx, Pt^{2+}/MnOx, and Pt/MnOx(s).

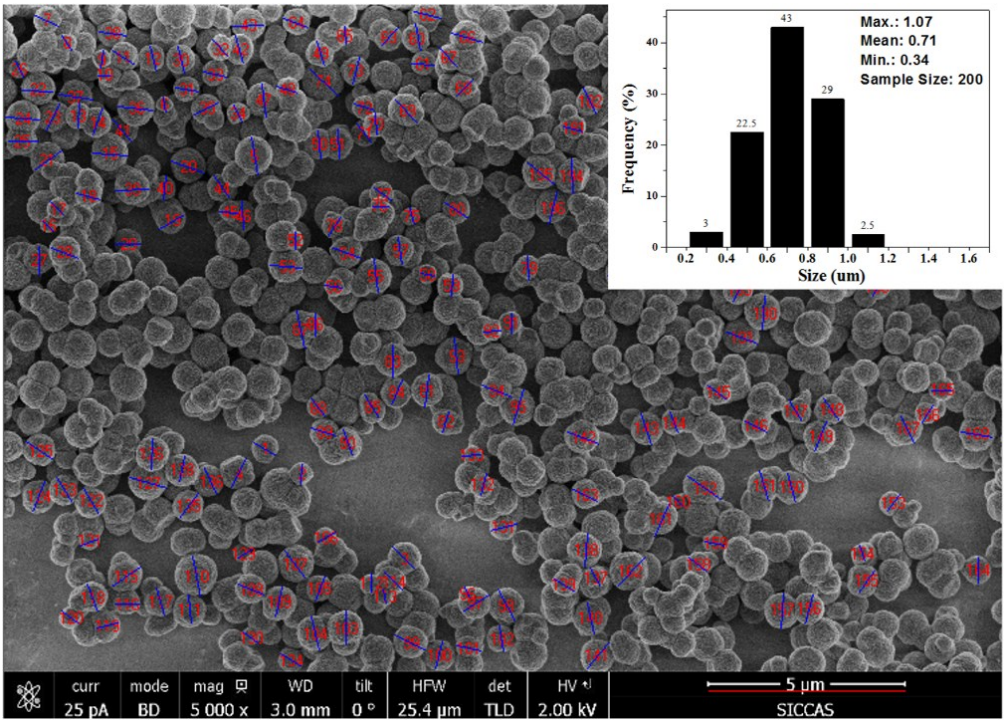

Fig. S3 SEM image of MnCO3. Inset is the particle size distribution and relative characteristic size data.

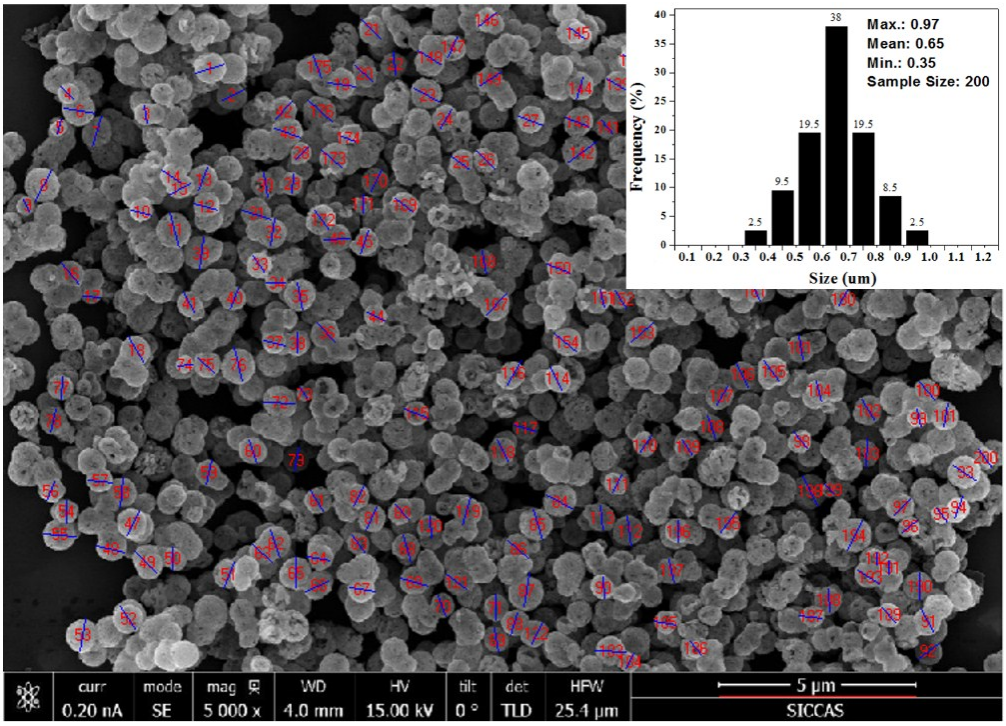

Fig. S4 SEM image of MnOx. Inset is the particle size distribution and relative characteristic size data.

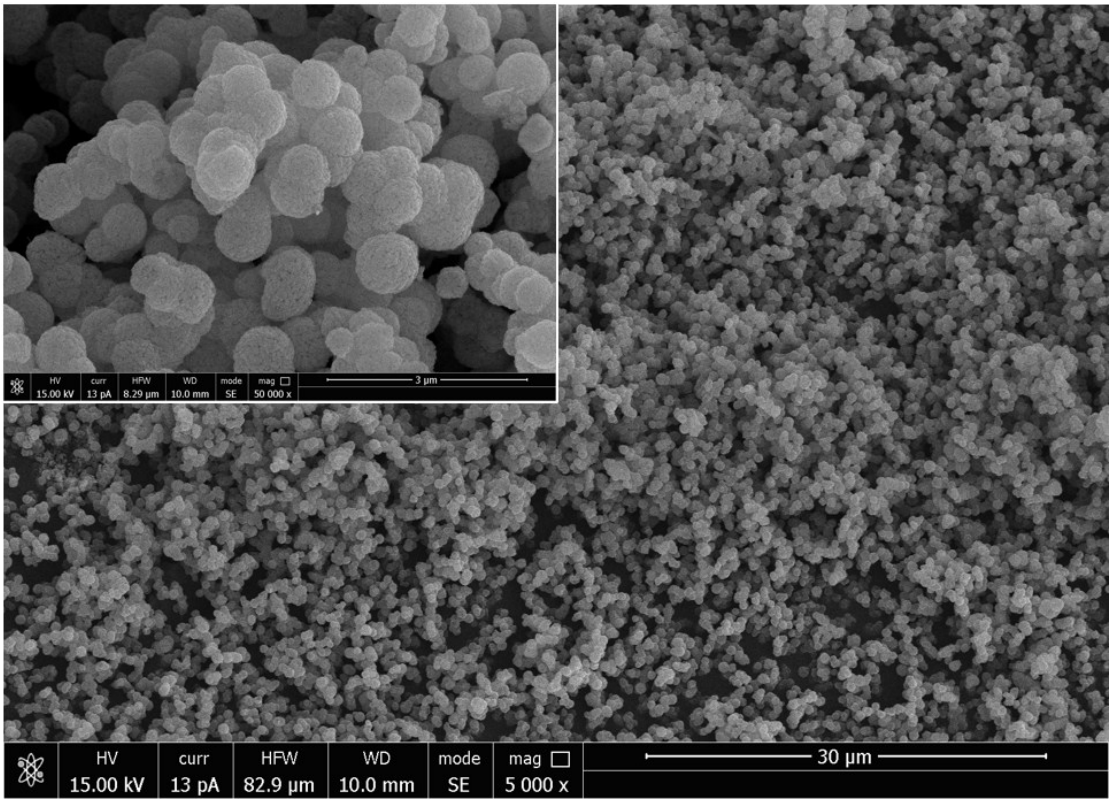

Fig. S5. SEM images of different magnifications for MnO_x-H_2O that is produced as follows: 2 g of $MnCO_3$ was dispersed in 2000 mL of water under stirring and ultrasonication; after aging for 24 h under stirring, the precipitate was dried at 100 ^oC, and finally calcined at 500 ^oC in static air for 2 h.

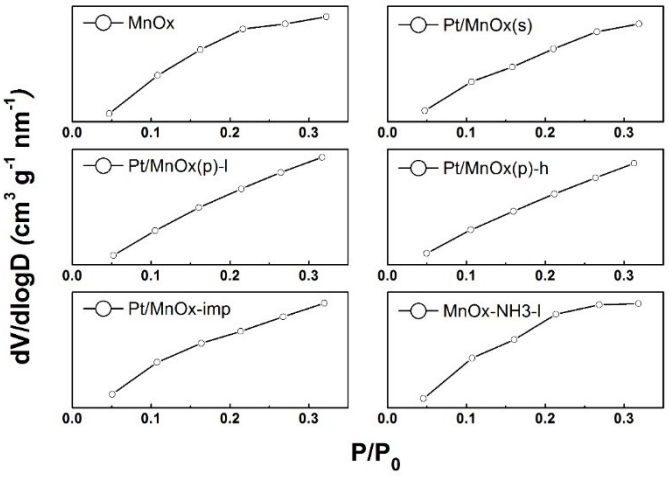

Fig. S6. N_2 adsorption curves of different catalysts as indicated.

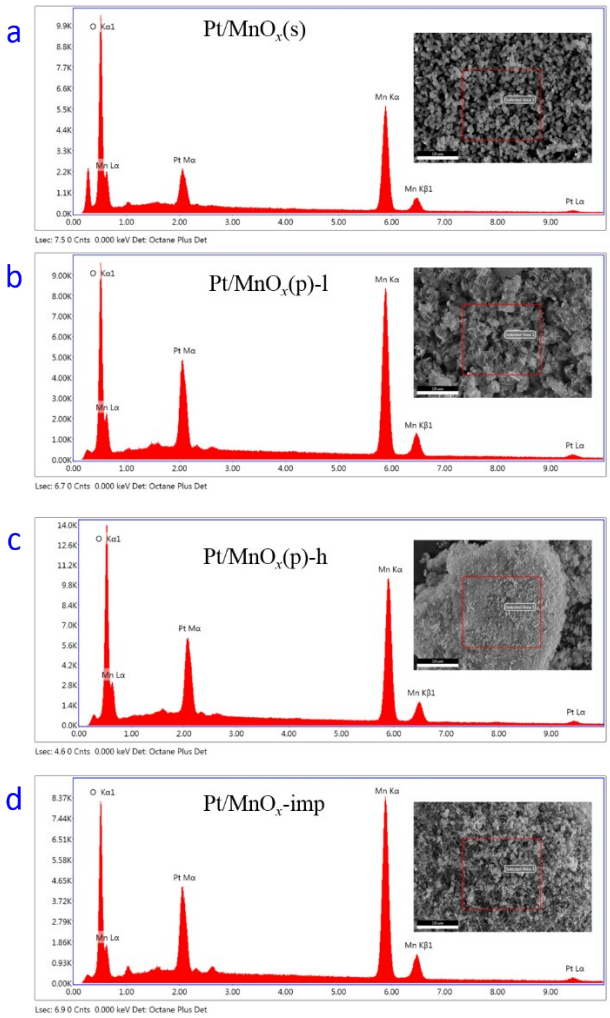

Fig. S7 SEM-EDS patterns of different catalysts as indicated. Insets show the corresponding morphology image and the scope for signal collection.

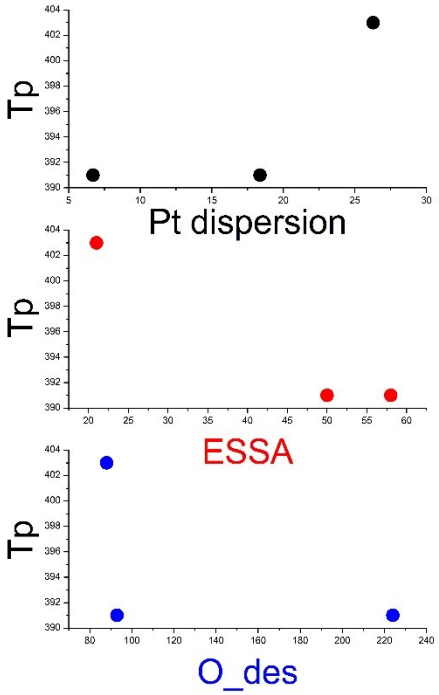

Fig. S8 Comparison between the peak combustion rate temperature Tp (in ^{o}C) and Pt dispersion (in %), ESSA (in m^2/g) or O_des (in a. u.). The data are from those for the three samples of $Pt^{\delta+}/MnO_x$(p)-l, $Pt^{\delta+}/MnO_x$(p)-h and $Pt^{\delta+}/MnO_x$-imp.

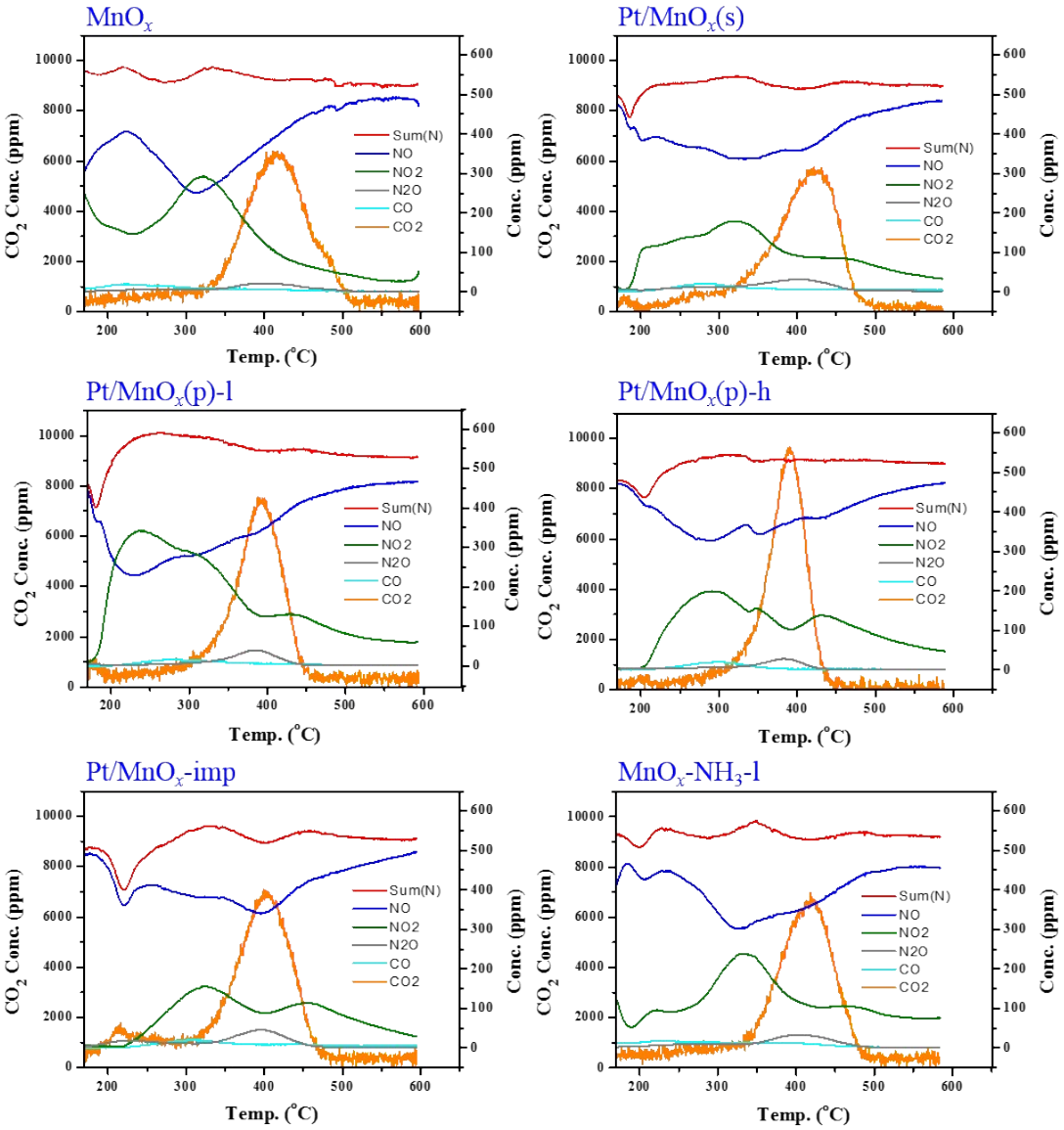

Fig. S9 Concentration evolution of NO, NO_2, N_2O, CO and CO_2 with increasing temperature during catalytic soot combustion over different samples as indicated. Sum(N) = NO + NO_2 + 2*N_2O.

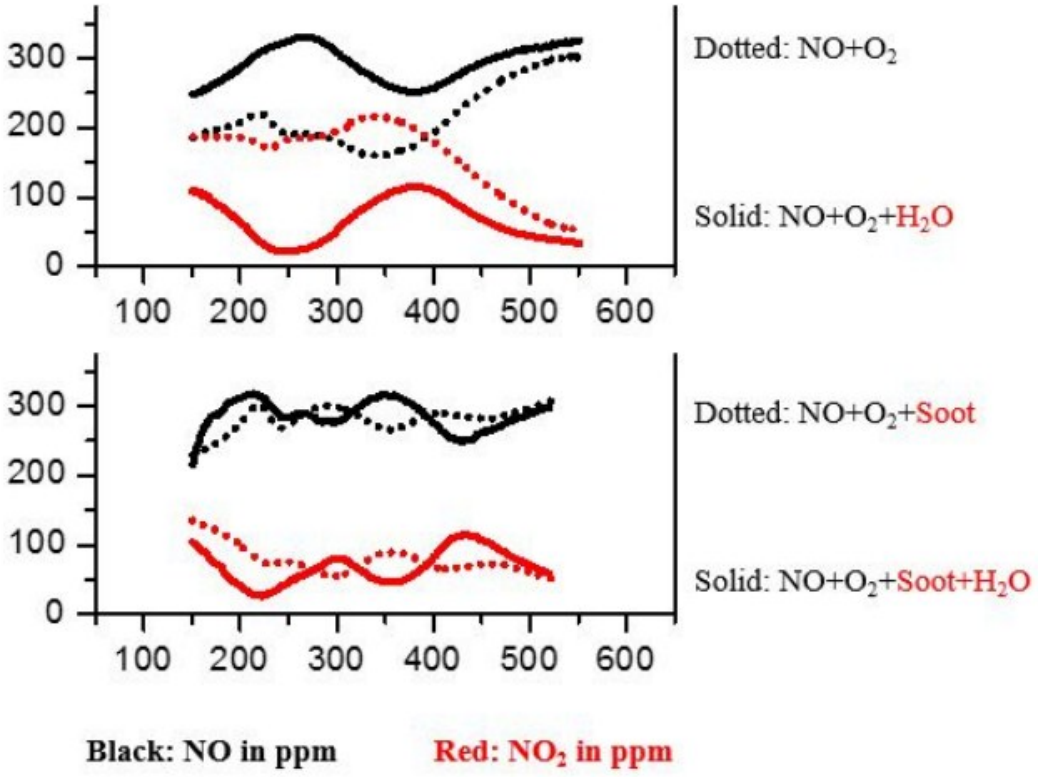

Fig. S10. Evolution of NO and NO_2 concentration during temperature-programmed oxidation experiments over a specific catalyst (Mn-containing) under different conditions as indicated.