Supplementary Information

Effect of oxygen coordination environment of Ca-Mn oxides on catalytic performance of Pd supported catalysts for aerobic oxidation of 5-hydroxymethyl-2-furfural

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This Supporting Information contains 1 Scheme and 5 Figures in 5 pages.

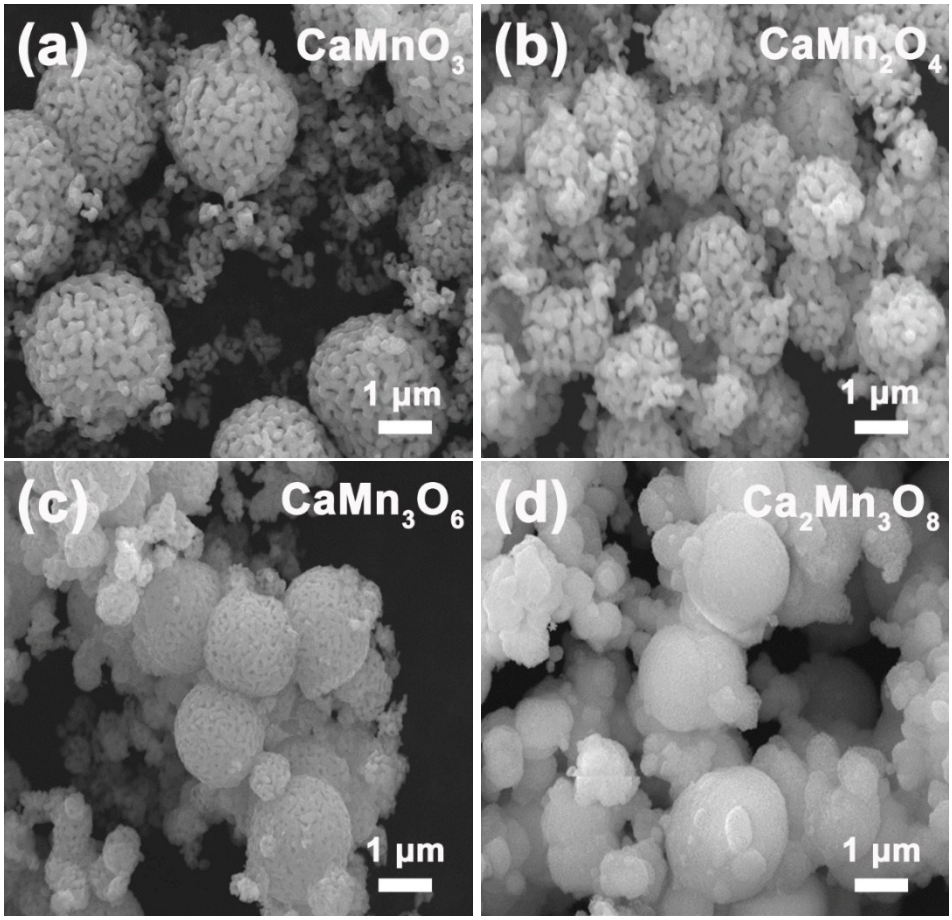


Fig. S1. Low magnification SEM images of the obtained $Ca_xMn_yO_z$ oxides.

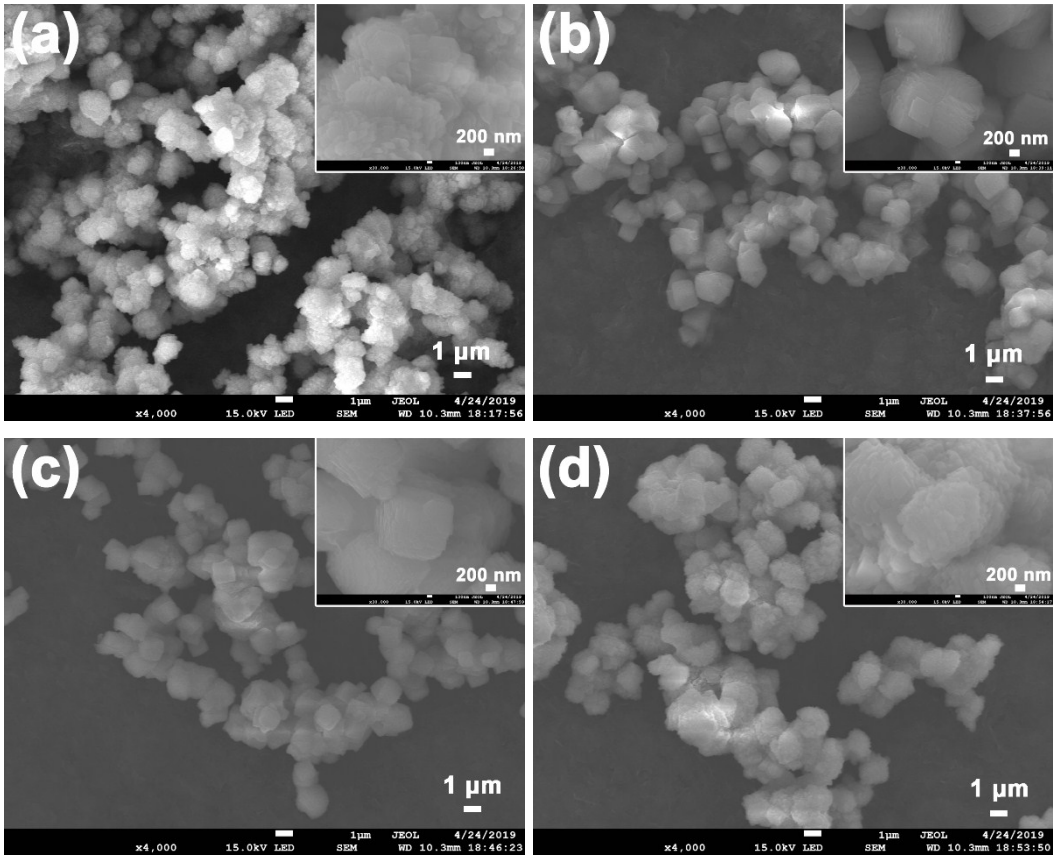


Fig. S2. SEM images of the $Ca_nMn_{1-n}CO_3$ precursors for (a) $CaMnO_3$, (b) $CaMn_2O_4$, (c) $CaMn_3O_6$ and (d) $Ca_2Mn_3O_8$.

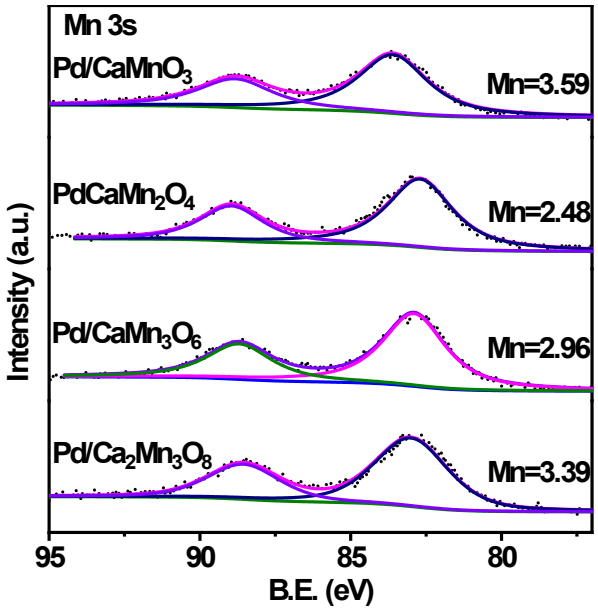


Fig. S3. Mn 3s XPS spectra of $Pd/Ca_xMn_yO_z$ catalysts. The mean valence states of Mn are calculated and marked in the Figure.

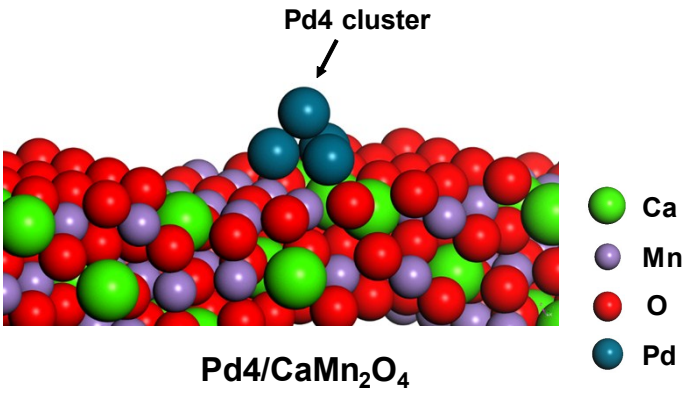


Fig. S4. The geometries of Pd4 cluster adsorbed onto the surface of $CaMn_2O_4$.

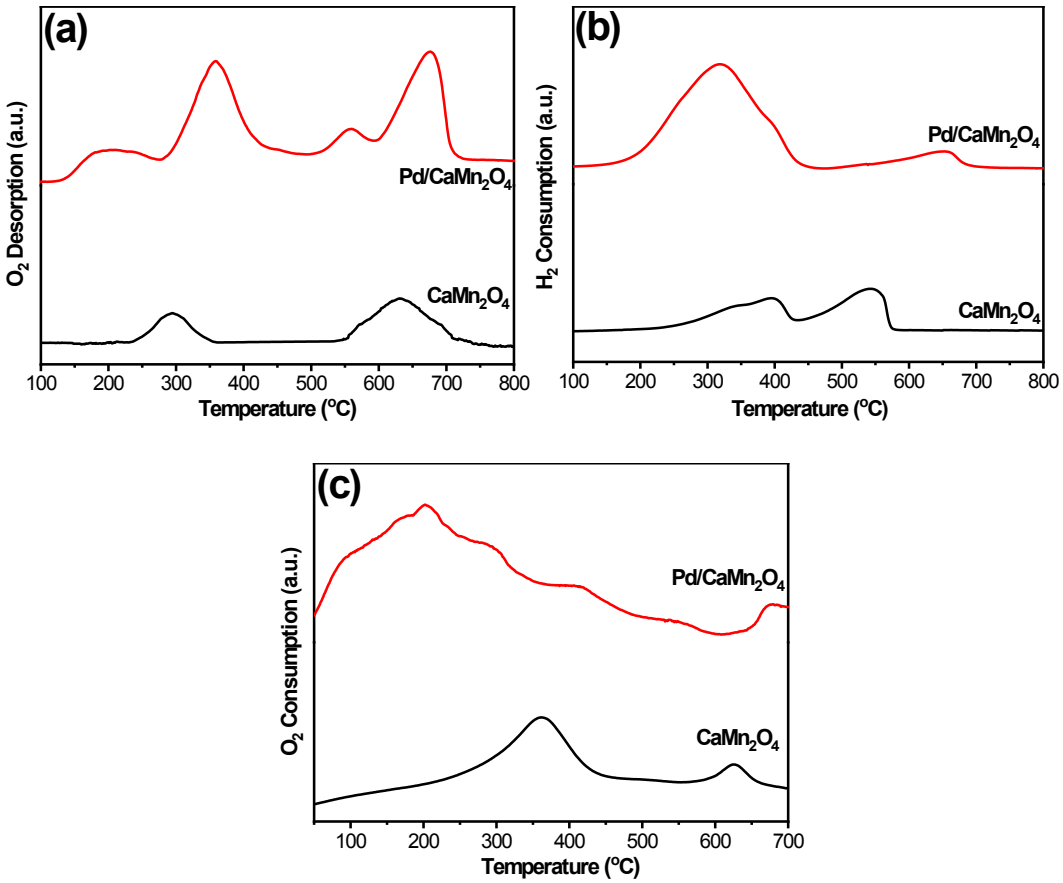
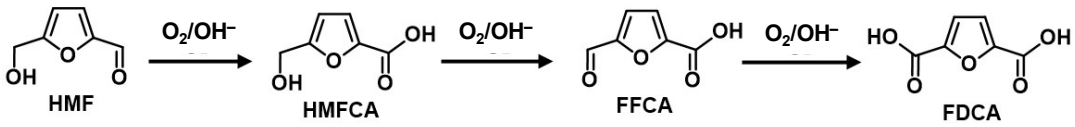


Fig. S5. (a) O_2-TPD, (b) H_2-TPR and (c) O_2-TPO results of $CaMn_2O_4$ and $Pd/CaMn_2O_4$.



$$HMF + 2OH^- \longrightarrow HMFCA + H_2O + 2e$$
$$HMFCA + 2OH^- \longrightarrow FFCA + 2H_2O + 2e$$
$$FFCA + 2OH^- \longrightarrow FDCA + H_2O + 2e$$
$$O_2 + 2H_2O + 4e \longrightarrow 4OH^-$$

Scheme S1. Oxidative conversion pathway from HMF to FDCA with molecular oxygen.