

Modulating Active Oxygen Species on α -MnO₂ with K and Pb for SCR of NO at Low Temperatures

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The calculation equations for the capacity of surface-active oxygen species in Fig. 1 (d)

$$C_{N_2} = 1.5 \int_0^t f(t) \times F \times \frac{1}{V_m} \times \frac{1}{m}$$

$$C_{N_2O} = 2 \int_0^t f(t) \times F \times \frac{1}{V_m} \times \frac{1}{m}$$

$$C_{NO} = 2.5 \int_0^t f(t) \times F \times \frac{1}{V_m} \times \frac{1}{m}$$

Where the $f(t)$ stands for the product concentration as a function of time; V_m stands for molar volume of the gas (L/mol); m stands for the weight of catalysts (g); F stands for the flow rate of the outlet gas (L).

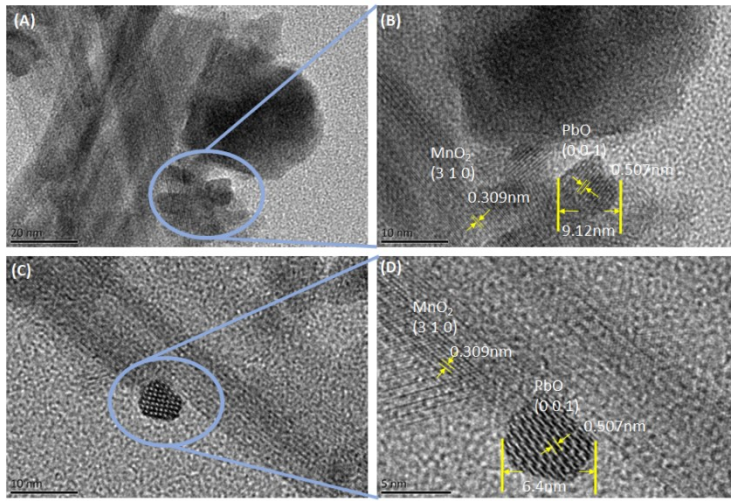


Figure S1 HRTEM images of Pb-MnO₂

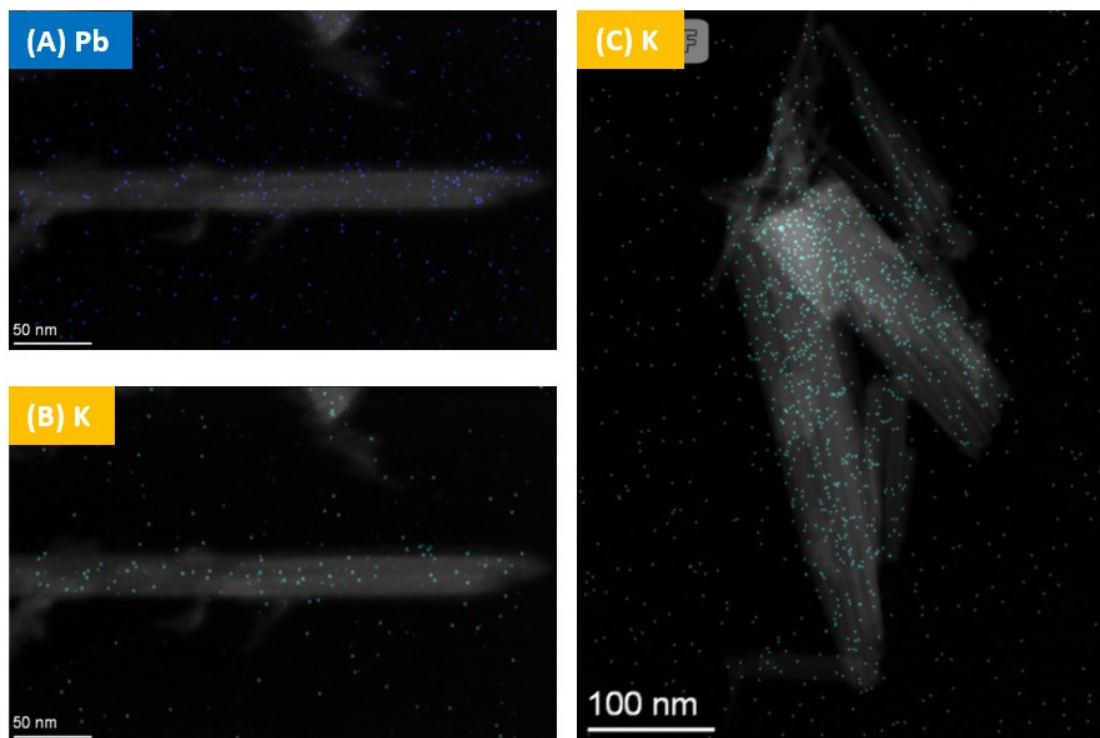


Figure S2 EDXS mapping of Pb and K on samples: Pb-MnO₂ (a, b); K-MnO₂ (c).

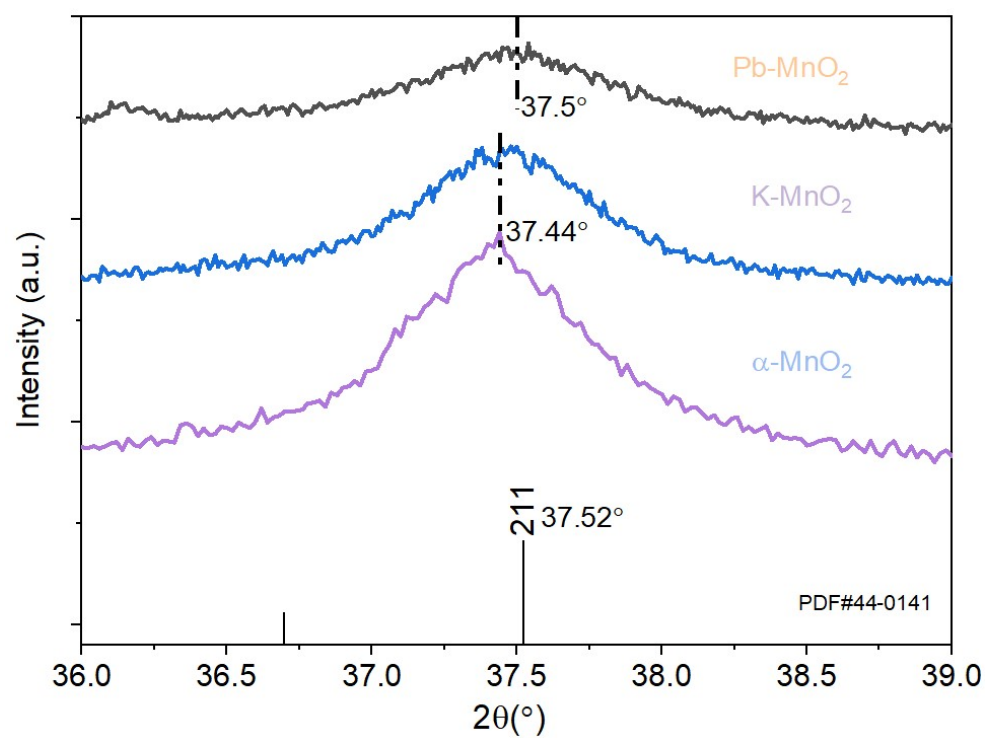


Figure S3 XRD spectra of MnO₂ samples after zooming in of Fig. 4 at the index of (211).

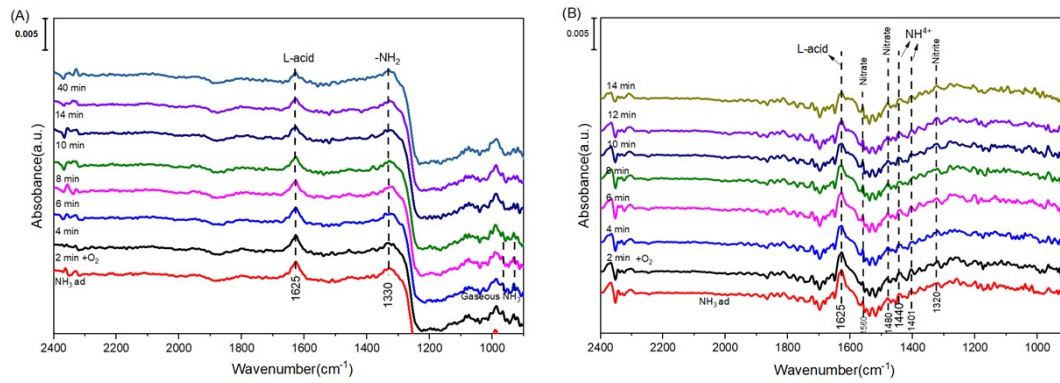


Figure S4 DRIFT spectra taken at 150 °C upon passing 500 ppm O₂ over the NH₃ pre-adsorbed on samples, (A)K-MnO₂; (B) Pb-MnO₂.

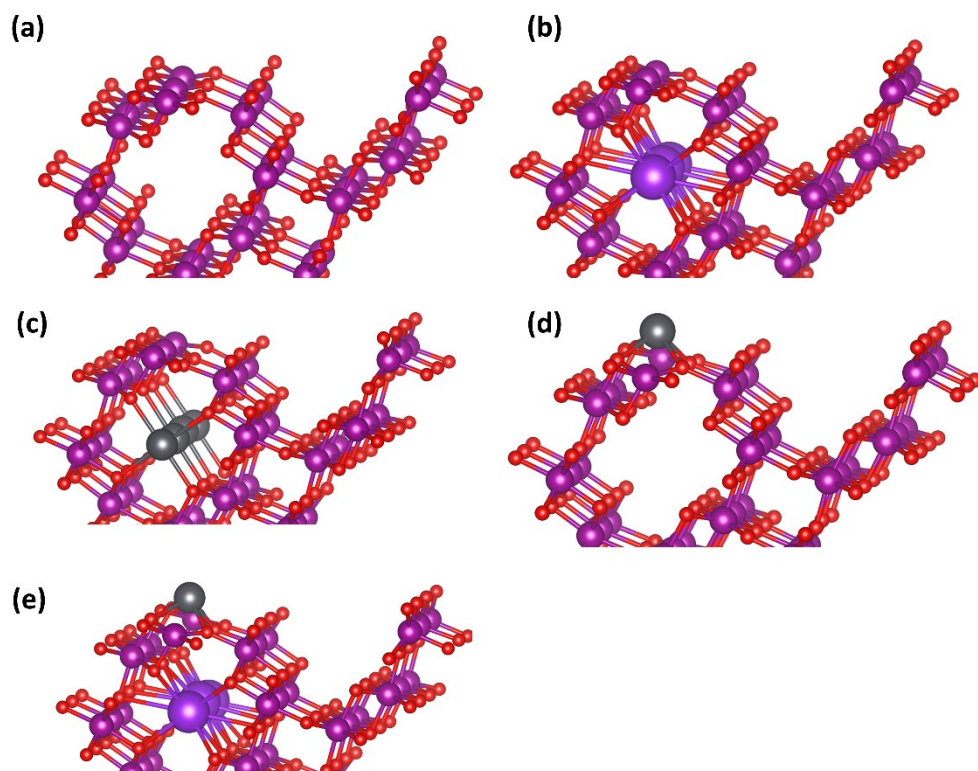


Figure S5 The side view of the structure model of the K and Pb doped MnO₂. (a) pure MnO₂; (b) K atoms were incorporated into the tunnels of MnO₂; (c) Pb atoms were incorporated into the tunnels of α -MnO₂; (d) surface Mn atom was substituted with Pb atom; (e) surface Mn atom was substituted with Pb atom and K atoms were incorporated into the tunnels of MnO₂.