Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information for

Enhanced Adsorption Removal of Methyl Orange from Aqueous Solution by Nanostructured Proton-Containing δ-MnO_2

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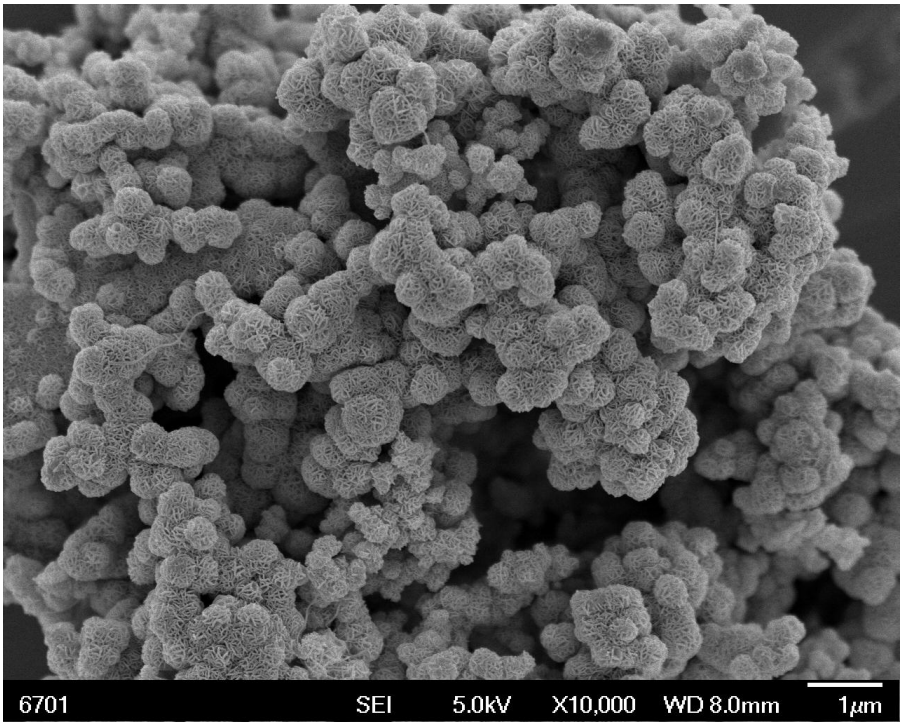
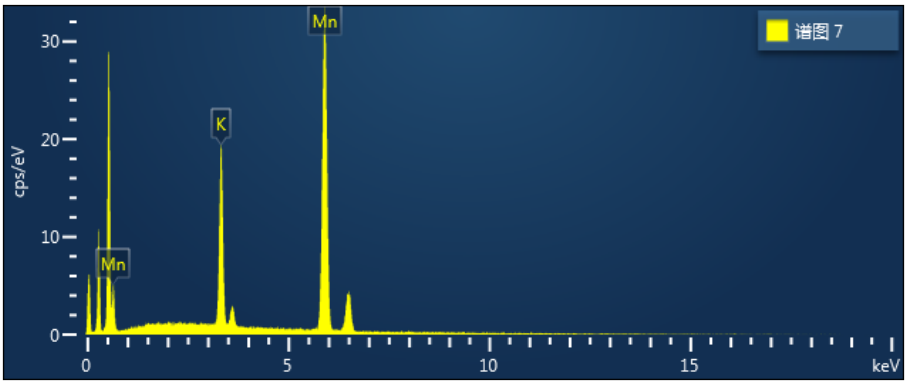
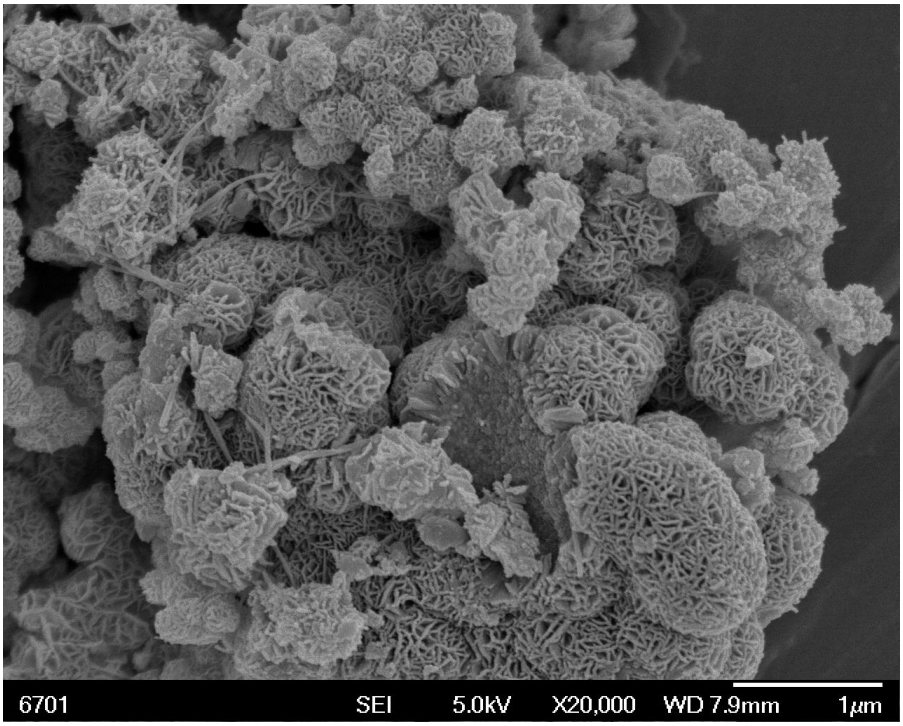
SEM image and EDX results of K-δ-MnO_2 nanosheets:



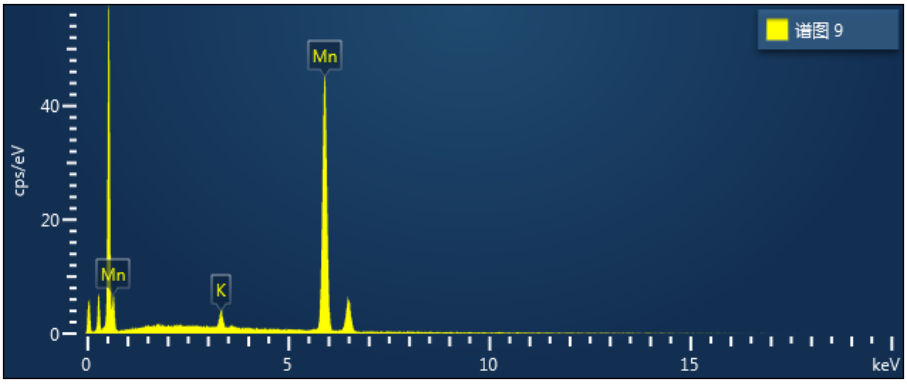
Element	Weight%	Atomic%
K K	17.05	22.41
Mn K	82.95	77.59
Totals	100.00	100.00



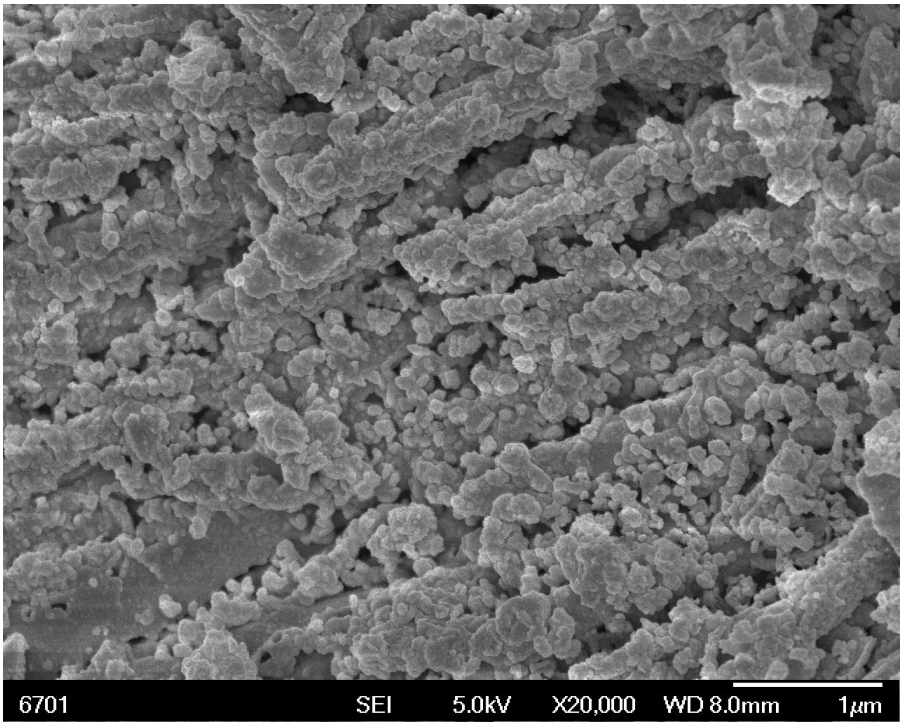
SEM image and EDX results of H-δ-MnO_2 nanosheets:



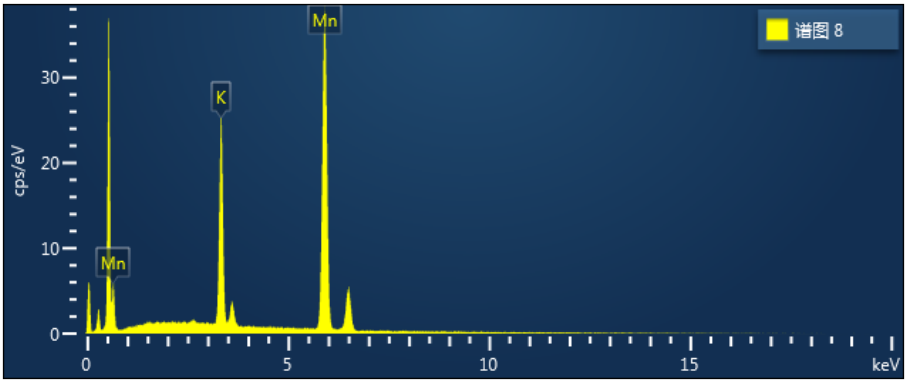
Element	Weight%	Atomic%
K K	2.53	3.52
Mn K	97.47	96.48
Totals	100.00	100.00



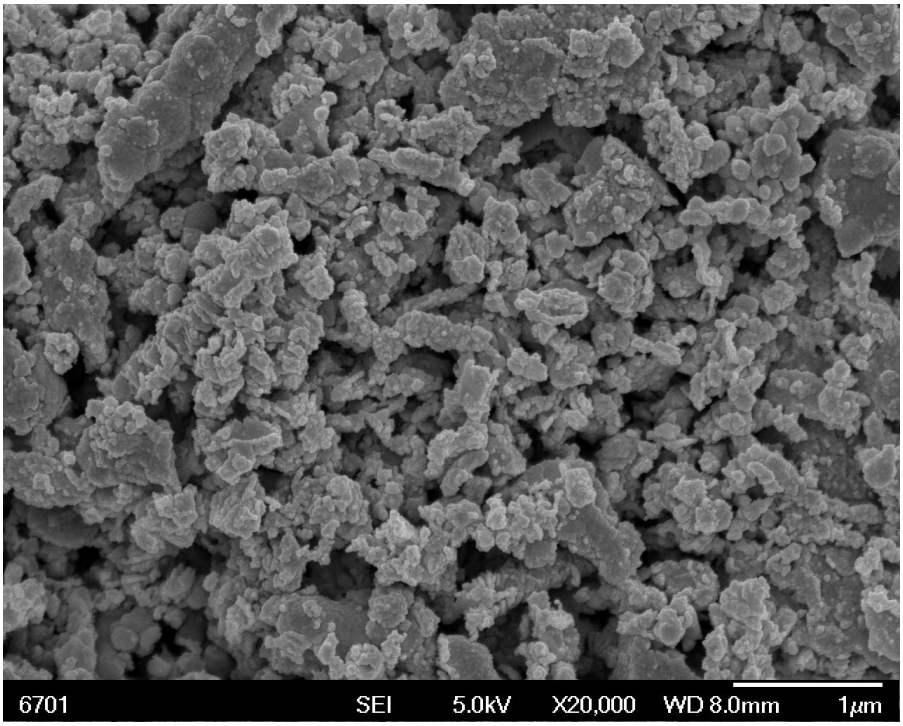
SEM image and EDX results of K-δ-MnO_2 nanoparticles:



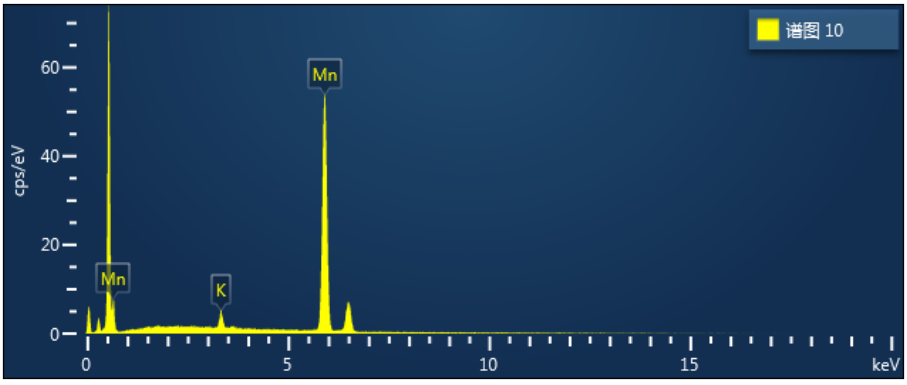
Element	Weight%	Atomic%
K K	18.98	24.76
Mn K	81.02	75.24
Totals	100.00	100.00



SEM image and EDX results of H-δ-MnO_2 nanoparticles:



Element	Weight%	Atomic%
K K	2.60	3.62
Mn K	97.60	96.38
Totals	100.00	100.00



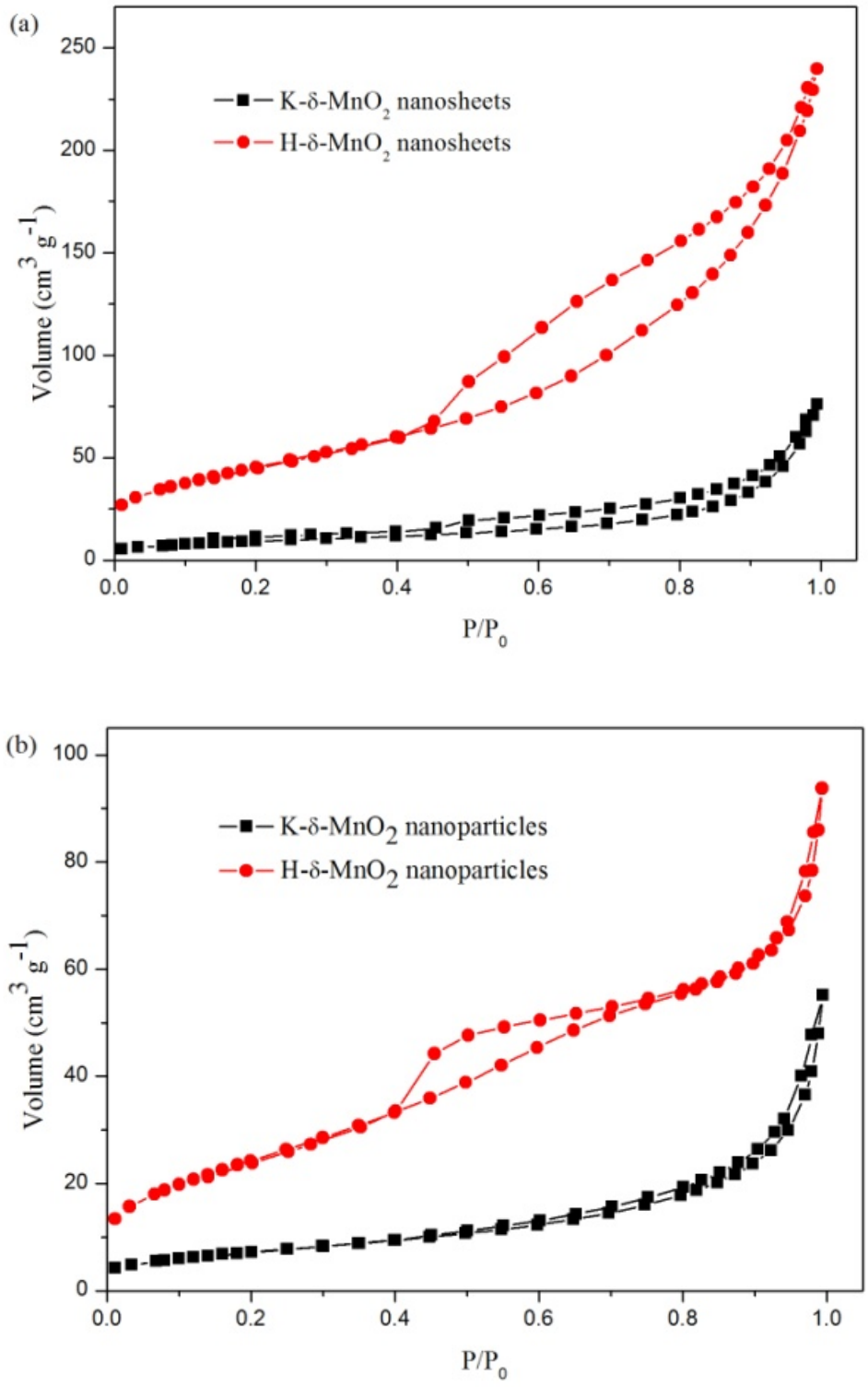


Fig. S1 N_2 adsorption-desorption isotherm of K-δ-MnO_2 nanosheets, H-δ-MnO_2 nanosheets (a), K-δ-MnO_2 nanoparticles and K-δ-MnO_2 nanoparticles (b).

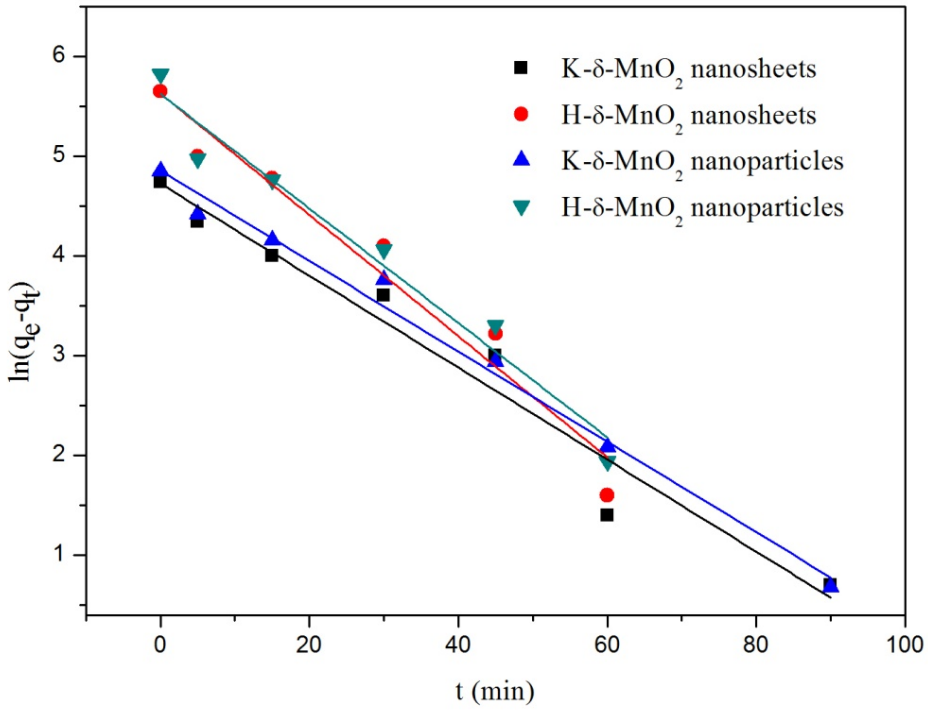


Fig. S2 Plot of the pseudo-first-order kinetic model for MO adsorption on different δ-MnO_2 materials.

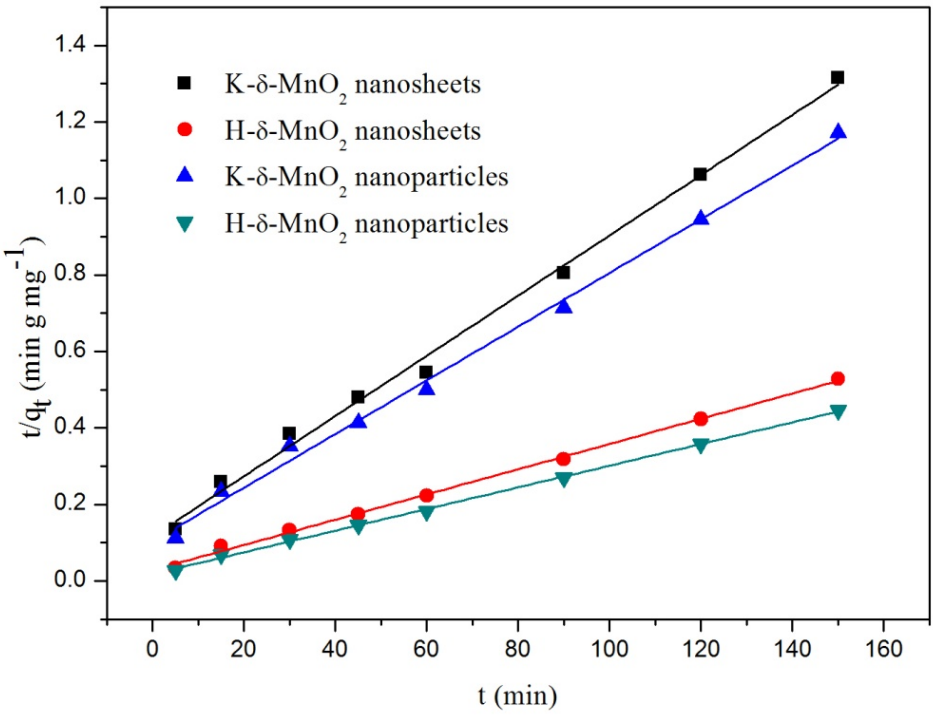


Fig. S3 Plot of the pseudo-second-order kinetic model for MO adsorption on different δ-MnO_2 materials.

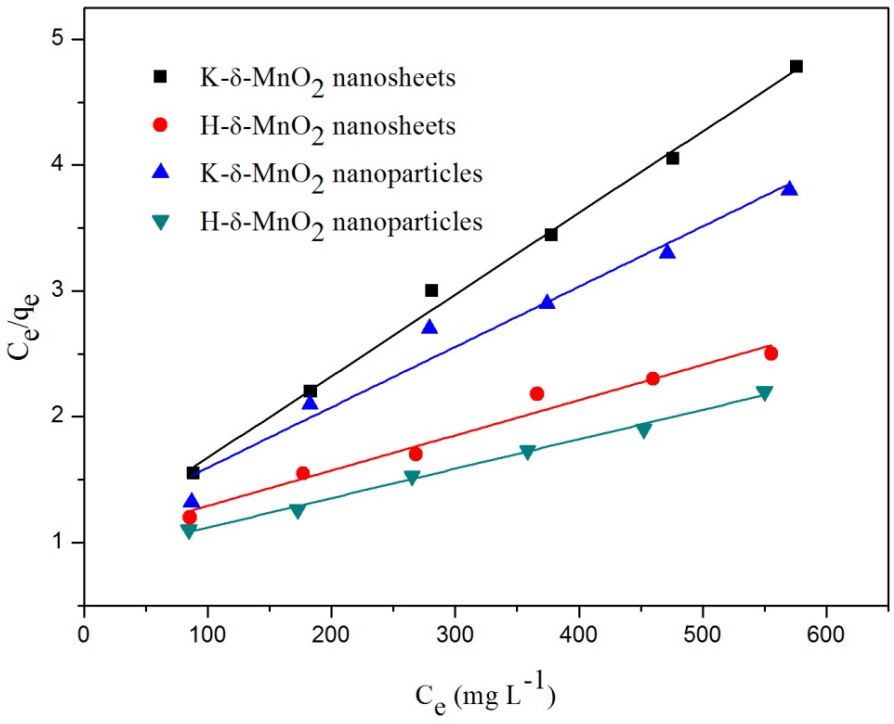


Fig. S4 Langmuir adsorption isotherm plots for MO adsorption onto different δ-MnO_2 materials.

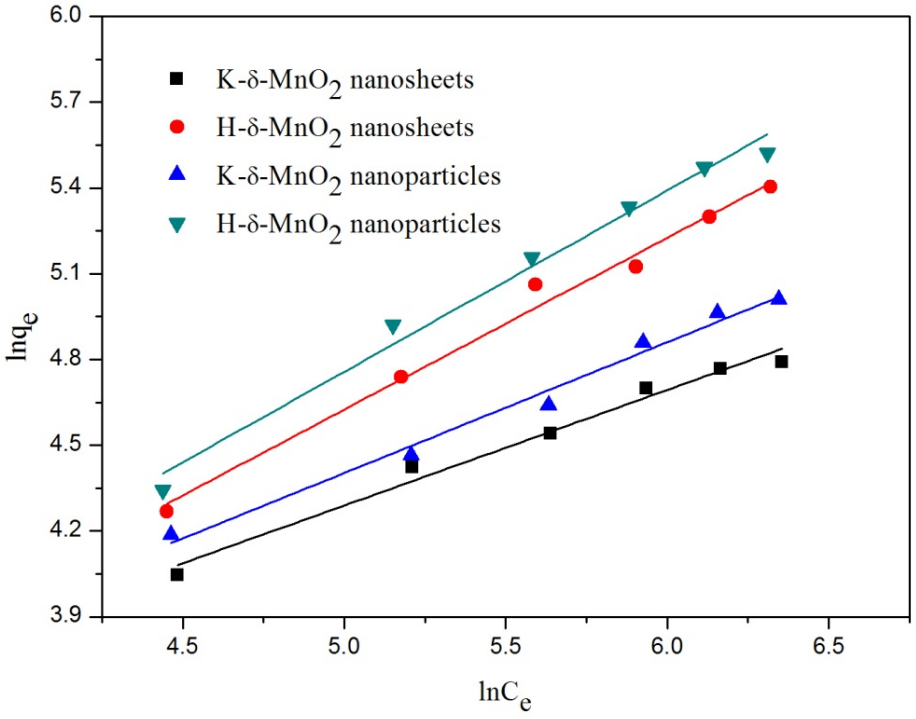


Fig. S5 Freundlich adsorption isotherm plots for MO adsorption onto different δ-MnO_2 materials.

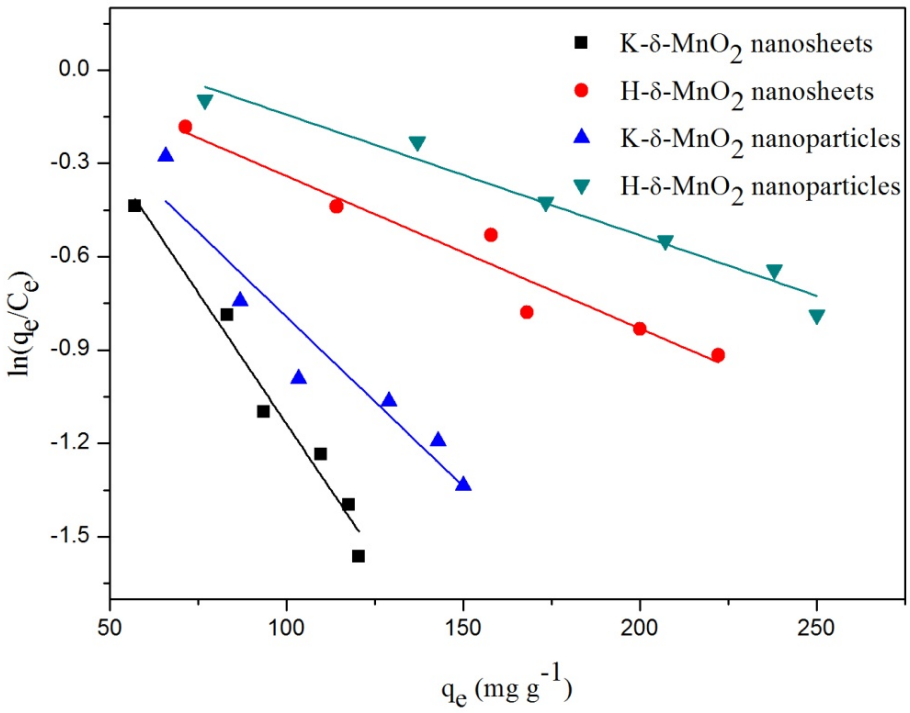


Fig. S6 Plots of ln q_e/C_e *vs.* q_e for calculation of thermodynamic parameters.