Supplementary Materials

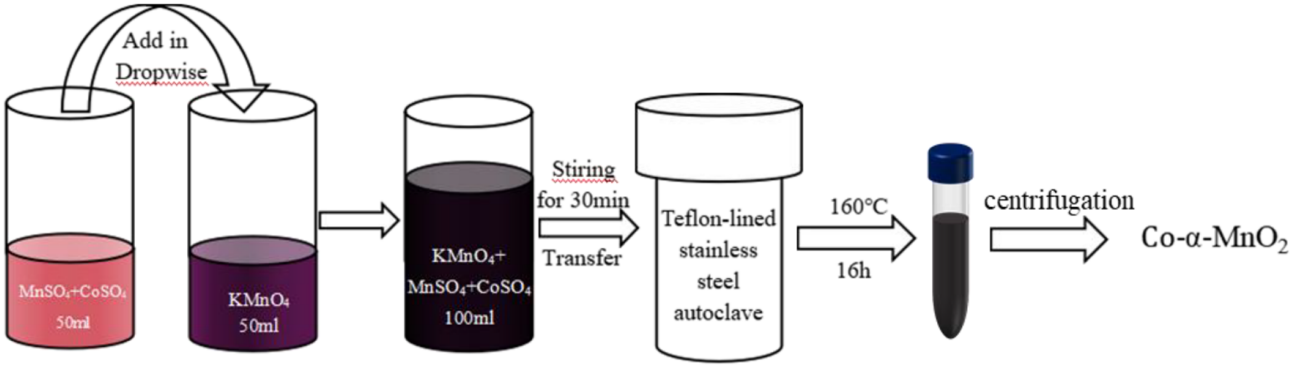

Fig. S1. Preparation flowchart of a new Co-doped α-MnO_2 as catalyst.

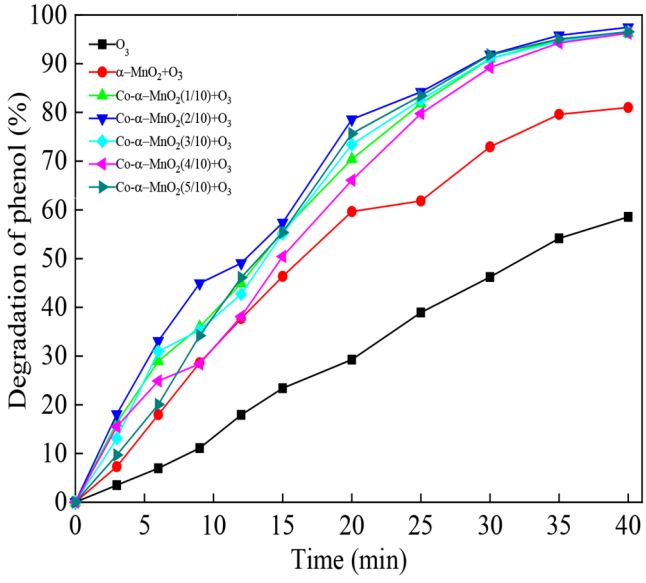

Fig. S2. Ozonation and catalytic ozonation by α-MnO_2 and Co doped α-MnO_2 with different Co/Mn molar ratios.

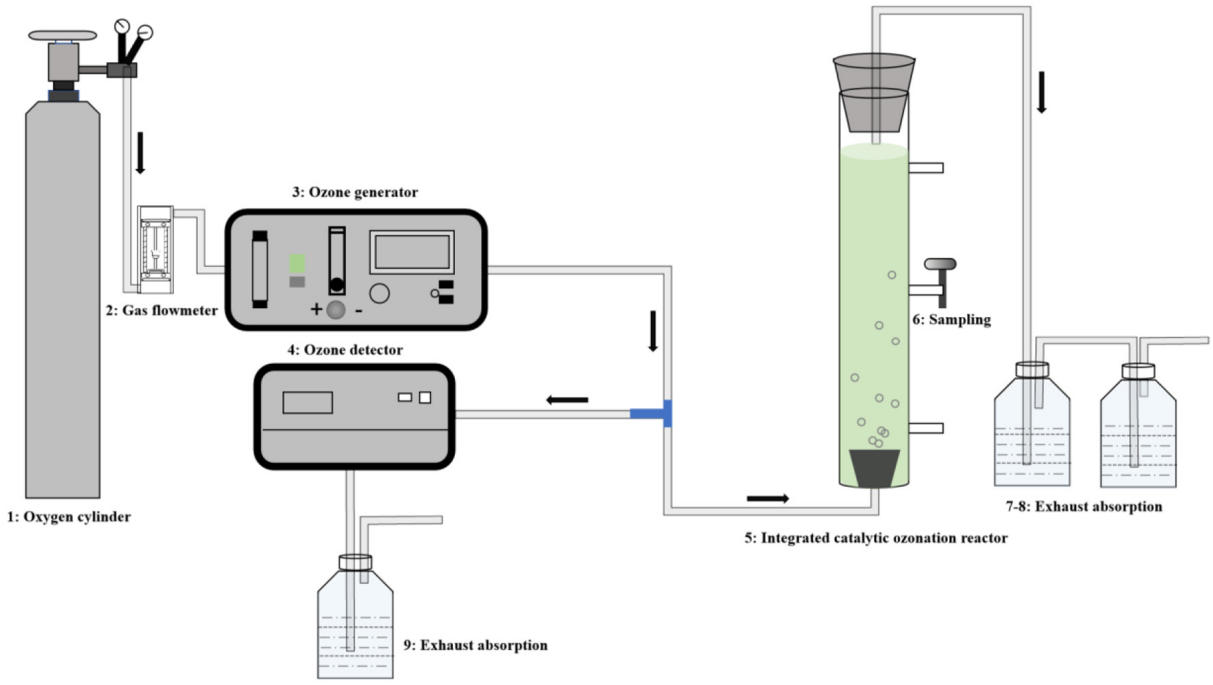

Fig. S3. Experimental Installation.

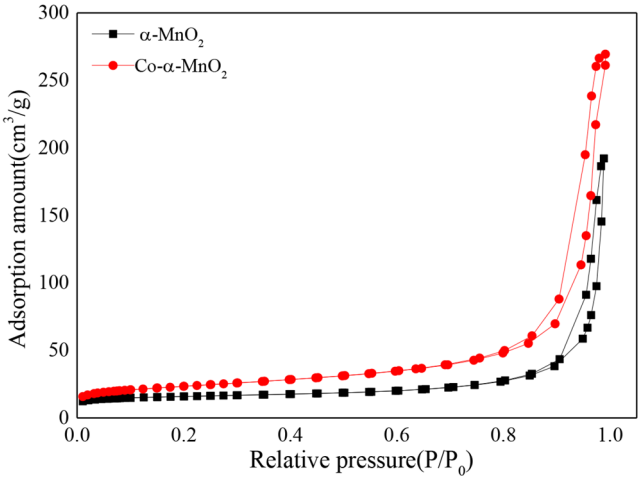

Fig. S4. N_2 adsorption-desorption isotherms of α-MnO_2 and Co-α-MnO_2.

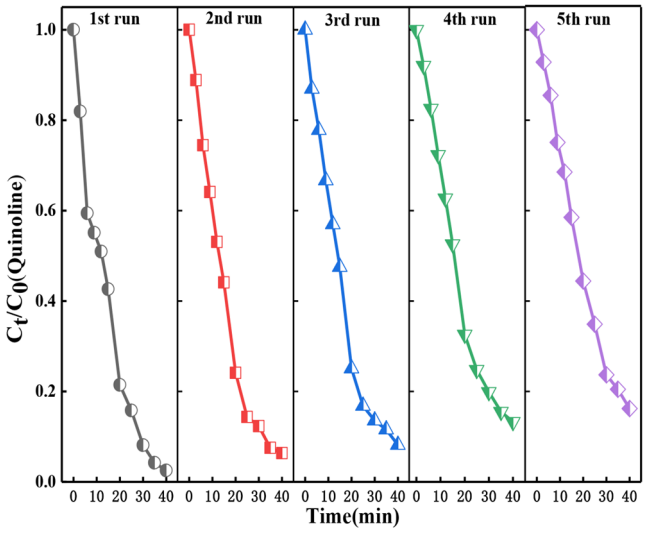

Fig. S5. Reusability of Catalyst.

Table S1. Parameters of Kinetic Fitting for the Removal Phenol

Order	Zero-order		First-order		Second-order	
System	K_1(min^{-1})	R^2	K_2(min^{-1})	R^2	K_3(min^{-1})	R^2
O_3	6.172	0.996	0.023	0.987	8.862×10^{-5}	0.951
O_3/α-MnO_2	8.386	0.945	0.044	0.991	2.763×10^{-4}	0.936
O_3/Co-α-MnO_2	10.303	0.909	0.092	0.975	1.986×10^{-3}	0.708

Table S2. Relative element content of α-MnO_2 and Co-α-MnO_2

Catalysts	Mn (%)	O (%)	Co (%)	Mn/O	Co/Mn	Co/O
α-MnO_2	27.77	56.59	-	0.491	-	-
Co-α-MnO_2	23.21	55.64	4.27	0.417	0.184	0.076