Supporting Information

A novel of $Co(OH)_2/Cu_2O$ nanocomposite activated peroxydisulfate for enhanced degradation of tetracycline

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Material characterization

The surface morphology of the catalyst was observed by scanning electron microscopy (SEM, IEOL JSM-7800F) and transmission electron microscopy (TEM, FEI TECNAI F20). The crystal structure of the catalyst was characterized by X-ray diffraction, (XRD, D/max250PC, Rigaku), X-ray photoelectron spectroscopy (XPS) was performed using an X-ray photoelectron spectrometer (ESCALAB 250Xi A1440, Thermo Scientific). Fourier transform infrared (FTIR) spectra were obtained by (Nicolet-380 FTIR) spectrophotometer. Brunauer-Emmett-Teller (BET) method was used to determine the specific surface area and pore size distribution of the catalyst.

Table S1 Comparison of element changes in $Co(OH)_2/Cu_2O$ catalyst by EDS analysis

	Actual atomic ration			Theoretical atomic ratio		
	Cu	Co	O	Cu	Co	O
0.1	61.38	3.21	35.41	60.60	3.03	36.37
0.5	41.47	12.26	46.27	44.44	11.11	44.45
0.7	40.40	12.84	46.76	39.21	13.73	47.06
1	31.76	17.23	51.01	33.33	16.67	50.00

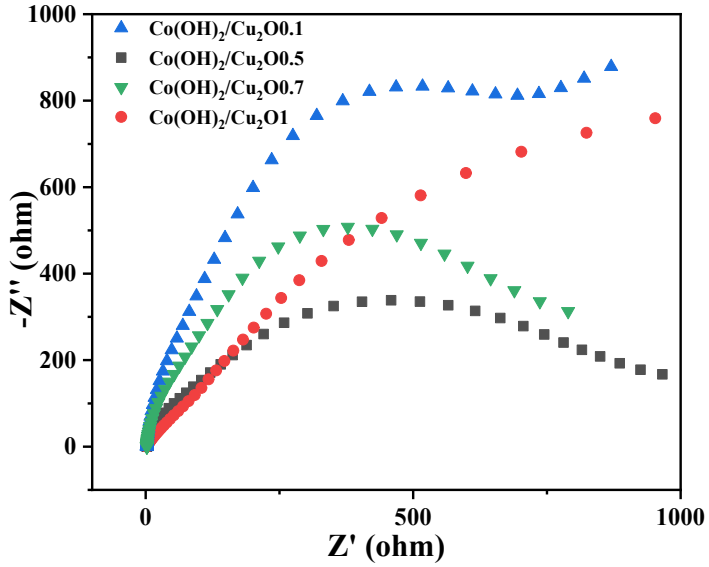

Fig. S1 EIS Nyquist plots of $Co(OH)_2/Cu_2O0.1$, $Co(OH)_2/Cu_2O0.5$, $Co(OH)_2/Cu_2O0.7$ and $Co(OH)_2/Cu_2O1$.

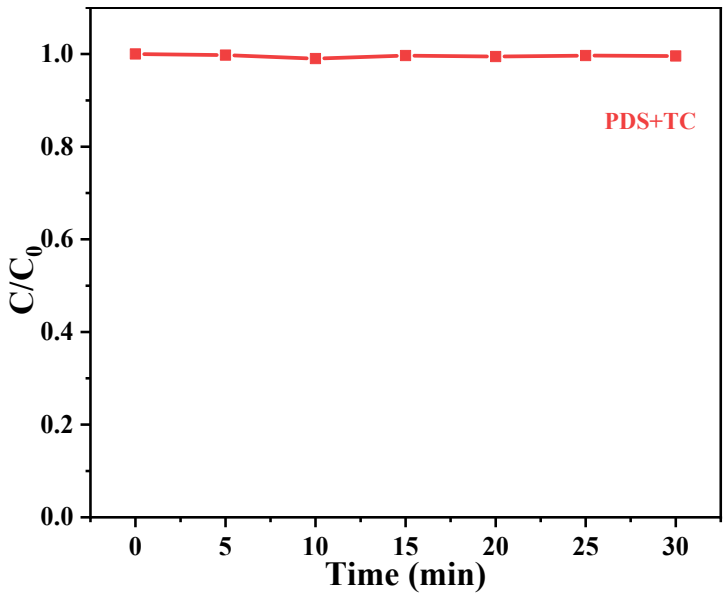

Fig. S2 Blank experiment without catalysts.

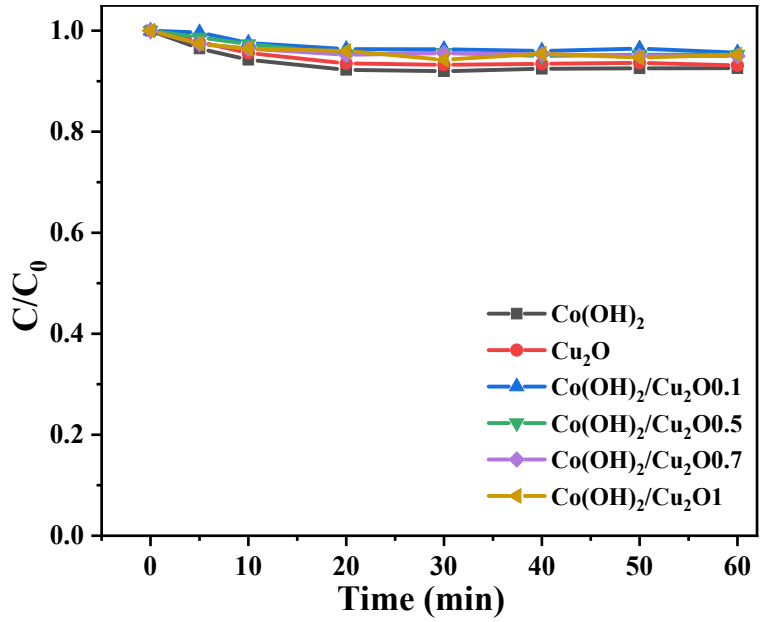

Fig. S3 Adsorption experiments to TC over different samples.

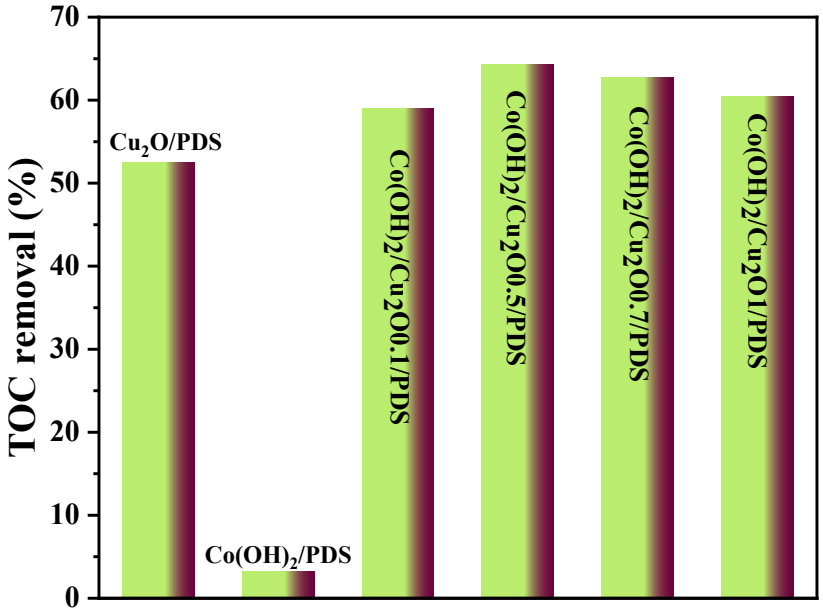

Fig. S4 TOC removal rate over different degradation system.

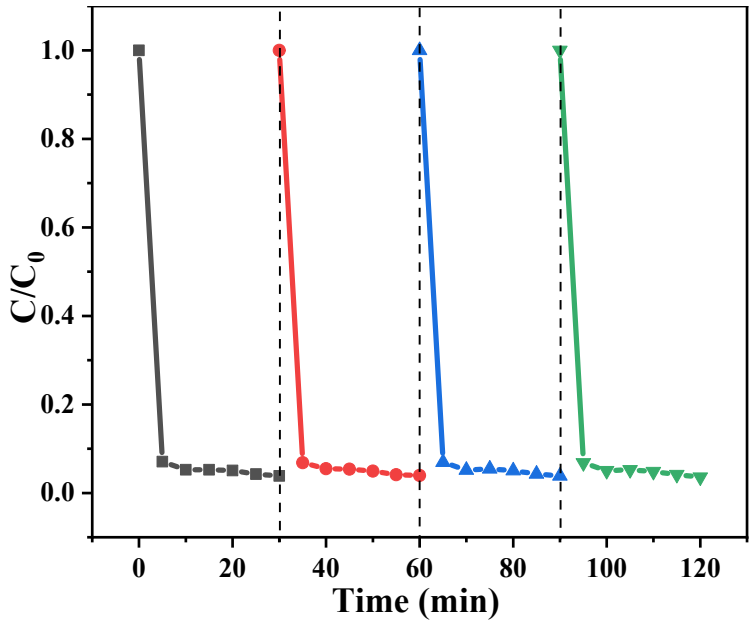

Fig. S5 Recycle experiments for TC degradation in $Co(OH)_2/Cu_2O$/PDS system.

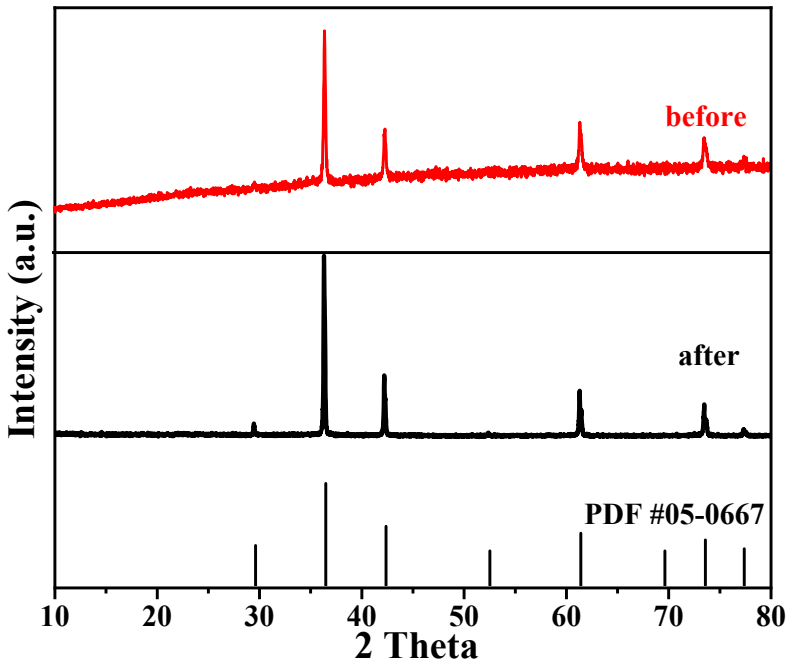

Fig. S6 XRD patterns of $Co(OH)_2/Cu_2O$0.5 before and after degradation reaction.

Table S2 Comparison with reported works of other catalyst systems

Catalyst	Reaction conditions	Time (min)	Removal efficiency	Ref.
Cu_2O/FNC	[PMS] = 2 mmol/L; [catalyst] = 0.1 g/L;	60	95%	1

CuO	[FNC] = 20 mg/L [PDS] = 5μM; [catalyst] = 200 mg/L; [2,4-DCP] = 5 Mm	60	40%	2
Cu_2O/Au	[catalyst] = 0.1 g/L; [methyl orange] = 15 mg/L	60	74%	3
$CuO/MnFeO_4$	[PMS] = 1 g/L; [catalyst] = 1 g/L; [LEV] = 5 mg/L	120	92.3%	4
$CuFeO_2$	[PMS]= 1 g/L; [catalyst] = 1 g/L; [LEV] = 5 mg/L	60	80%	5
$Co(OH)_2/Cu_2O$	[PDS] = 30 mg/L; [catalyst] =0.5 g/L; [TC] =10 mg/L	30	98%	**This work**

References

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