

Supporting Information

For

Activated carbon adsorption enhanced removal of organic contaminant for catalytic ceramic membrane with peroxymonosulfate activation

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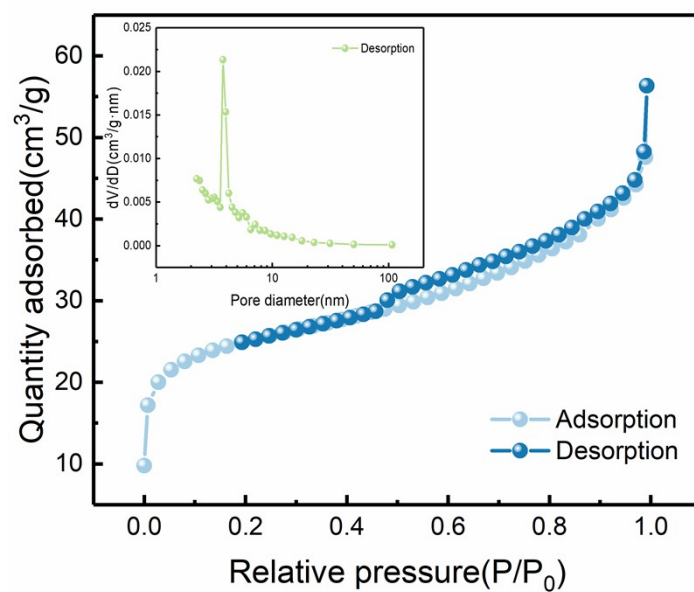


Fig. S1. Nitrogen adsorption curve and pore size distribution of GAC.

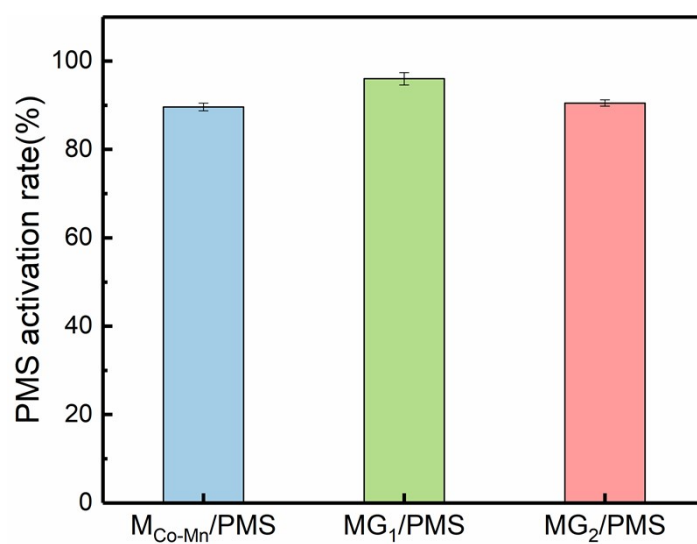


Fig. S2. PMS activation efficiency in different systems. ($[BPA]_0 = 10$ mg/L, $[PMS]_0 = 0.1$ mM, $[Flux] = 60$ LMH)

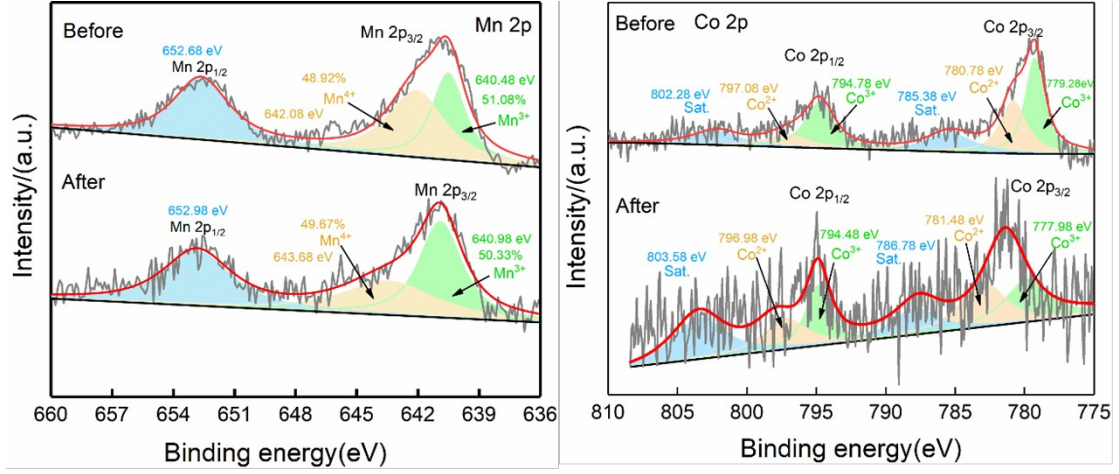


Fig. S3. XPS spectra of the before and after M_{Co-Mn}, Co 2p (a) and Mn 2p (b).

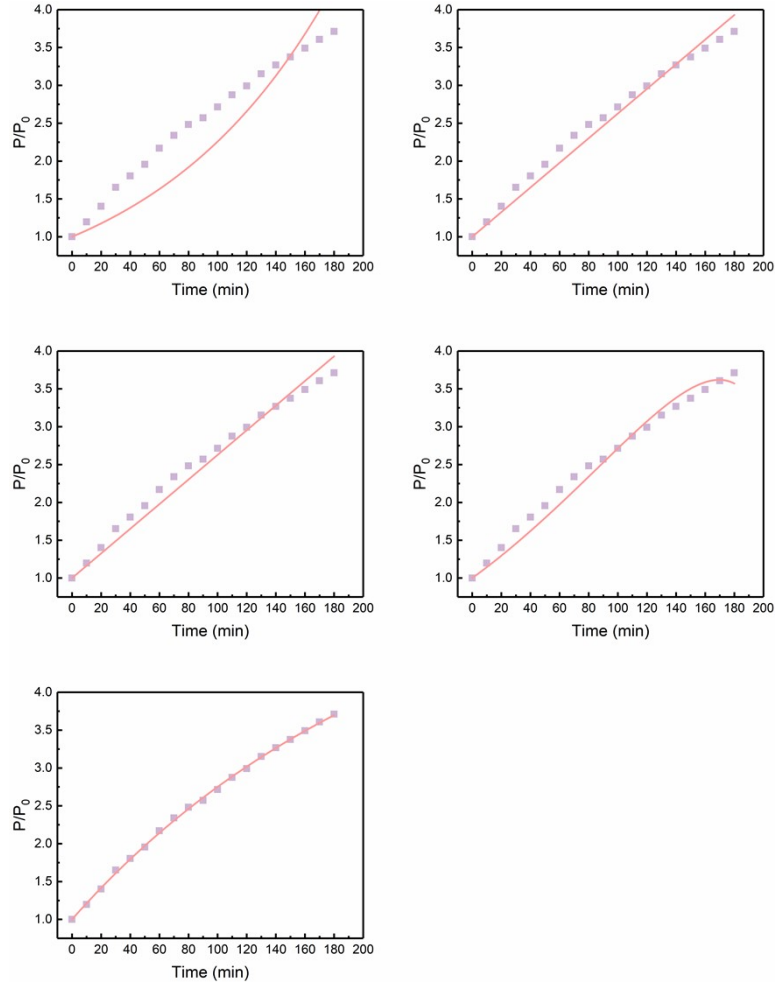


Fig. S4. The model fitting results of individual M₀ filtration with actual water samples for five combined fouling models are as follows: (a) Intermediate standard blockage model, (b) Filter cake layer intermediate blockage model, (c) Cake layer standard blocking model, (d) Complete-standard blockage model, (e) The filter cake layer complete blockage model.

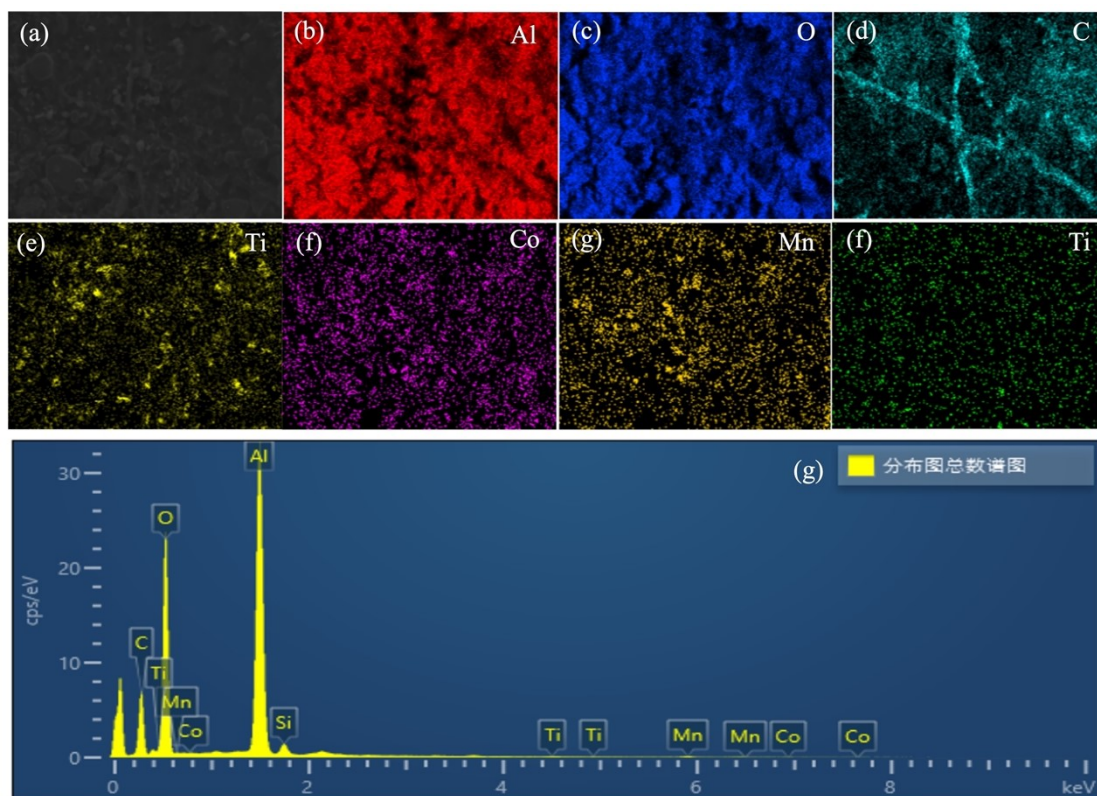


Fig. S5. EDS of M_{Co-Mn} after filtering actual water.

Table S1. Water quality of Dingjiahe river water.

Water quality parameters	River water	Water quality parameters	River water
TOC (mg/L)	20.89	pH	8.8
UV ₂₅₄ (cm ⁻¹)	0.33	COD _{Mn} (mg/L)	10.3
Turbidity (NTU)	2.82	TN (mg/L)	1.8
TDS (mg/L)	525.6	TP (mg/L)	0.023

Table S2. Evaluation parameters for pore structure of GAC.

Sample name	Specific surface area (m ² /g)	Pore volume (cm ³ /g)	Most probable aperture (nm)	Average pore radius (nm)
GAC	81.3913	0.087155	3.76	2.14

*The most probable aperture is all BJH desorption most probable aperture.

Table S3. Properties of the flat-sheet ceramic membrane.

Type	Membrane parameters
Major component	Al ₂ O ₃ , TiO ₂ , SiO ₂
Width/Height (mm)	68/5
Thoroughfare (mm)	15 (4×4)
Average pore size (nm)	300
Porosity (%)	40
Pure water membrane flux (LMH/bar)	1.28×10 ³

Table S4. Fit of actual water samples filtered by different systems to a composite membrane contamination model.

	Fitted Regression Coefficient R ²	Intermediate standard blockage model	Filter cake layer intermediate blockage model	Cake layer standard blocking model	Complete standard blockage model	The filter cake layer complete blockage model
M ₀	PMS=0	0.7694	0.9758	0.9779	0.9780	0.9992
M _{Co-Mn}	PMS=0	0.9903	0.9648	0.8235	0.9385	0.9663

M _{Co-Mn}	PMS=0.1mM	0.9931	0.9843	0.9902	0.9812	0.8796
M _{Co-Mn}	PMS=0.2mM	0.9925	0.9901	0.9892	0.9511	0.9899
M _{Co-Mn}	PMS=0.3mM	0.9923	0.9936	0.9916	0.9921	0.9632

Table S5. The content of elements on M_{Co-Mn} after filtering actual water.

Element	Wt%	At%
C	26.42	37.58
O	38.87	41.51
Al	30.22	19.14
Si	1.28	0.78
Ti	0.32	0.11
Mn	2.00	0.62
Co	0.88	0.26