Electronic Supplementary Material (ESI) for Analytical Methods.

Supplementary Material

Spectrophotometric determination of peroxymonosulfate anion via oxidative decolorization of dyes induced by cobalt

J. Q. Zhang,[a] J. Ma,[a,b]* J. Zou,[a] H.Z. Chi,[a] and Y. Song[a]

[a]State Key Laboratory of Urban Water Resource and Environment, Harbin Institute of Technology, Harbin 150090, P.R. China

[b]National Engineering Research Center of Urban Water Resources, Harbin Institute of Technology, Harbin 150090, P.R. China

Corresponding author: * Email address: majun@hit.edu.cn

Tel: (+86)–0451–8628–2292 Fax: (+86)–0451–8628–3010

Seven supplemental pages, including abbreviations in main text, one table and three figures:

Tab. SM-1. Physicochemical properties of AO7, MB, MV and RhB.

Fig. SM-1. The chemical structures of the four dyes (AO7, MB, MV and RhB).

Fig. SM-2. The degradation of 4–CP in Co(II)/PMS system. Conditions: $[Co^{2+}]$ = 40 μM, [PMS] = 1 mM, [4–CP] = 40 μM.

Fig. SM-3. Variations of PMS concentration for the degradation of 4–CP in Co(II)/PMS system with the iodometric method and the MB–based spectrophotometric method. Conditions: $[Co^{2+}]$ = 40 μM, [PMS] = 1 mM, [4–CP] = 40 μM.

Abbreviations:

AO7 —Acid orange 7;

MB —Methylene blue;

MV —Methyl violet;

RhB —Rhodamine B;

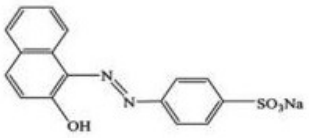
4–CP —4–chlorophenol;

PMS —Peroxymonosulfate (Oxone®, $KHSO_5 \cdot 0.5KHSO_4 \cdot 0.5K_2SO_4$).

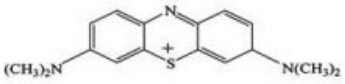
Tab. SM-1 Physicochemical properties of AO7, MB, MV and RhB.

Name	Formula	Molecular weight	λ_{max}	Molar absorption coefficient
AO7	$C_{16}H_{11}N_2NaO_4S$	350.32	485 nm	18500 mol^{-1} L cm^{-1}
MB	$C_{16}H_{18}N_3SCl$	319.85	663 nm	73500 mol^{-1} L cm^{-1}
MV	$C_{24}H_{28}N_3Cl$	393.96	590 nm	32100 mol^{-1} L cm^{-1}
RhB	$C_{28}H_{31}ClN_2O_3$	479.02	556 nm	106000 mol^{-1} L cm^{-1}

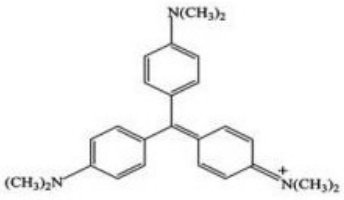
Fig. SM-1. The chemical structures of the four dyes (AO7, MB, MV and RhB).



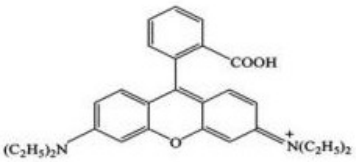
Acid orange 7 (AO7)



Methylene blue (MB)



Methyl violet (MV)



Rhodamine B (RhB)

Fig. SM-2. The degradation of 4–CP in Co(II)/PMS system. Conditions: [Co^{2+}] = 40 μM, [PMS] = 1 mM, [4–CP] = 40 μM.

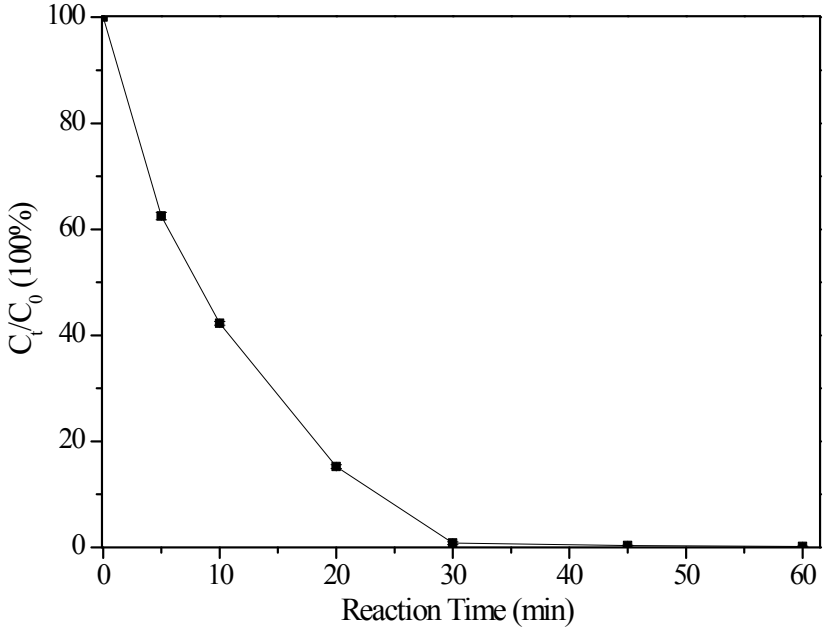


Fig. SM-3.Variations of PMS concentration for the degradation of 4–CP in Co(II)/PMS system with the iodometric method and the MB–based spectrophotometric method. Conditions: [Co^{2+}] = 40 μM, [PMS] = 1 mM, [4–CP] = 40 μM.