

Supporting Information

Sulfonated perylene bisimide-based conjugated organic polymer for simultaneous bisphenol A degradation and hydrogen peroxide production

Authors: *Yuzhe Zhang^{a†}, Aomei Li^{a†}, Zhenhao Fan^{a†}, Danfeng Wang^b, Shiyuan Zhou^{b*}, Guangfeng Liu^{b*}, Peiyang Gu^b, Zhongyu Li^{a*}*

Affiliations:

^a *School of Environmental Science and Engineering, Changzhou University, Changzhou 213164, China. E-mail: zhongyuli@mail.tsinghua.edu.cn*

^b *Jiangsu Key Laboratory of Advanced Catalytic Materials and Technology, School of Petrochemical Engineering, Changzhou University, Changzhou 213164, China. E-mail: zhoushiyuan@cczu.edu.cn; guangfeng.liu@cczu.edu.cn.*

[†] *These authors contributed equally to this work.*

Contents

Scheme S1 The schematic illustration of the synthetic procedure of PDI-CH₃-Cz

Fig. S1 The ¹H NMR spectrum of PDI-CH₃-Cz

Fig. S2 The XPS spectra of PPDI-C and PPDI-SO₃H

Fig. S3 The XRD images of (a) PPDI-C and (b) PPDI-SO₃H

Fig. S4 The SEM images of (a) PPDI-C and (b) PPDI-SO₃H

Fig.S5 Cyclic stability of H₂O₂ production over PPDI-SO₃H and PPDI-C

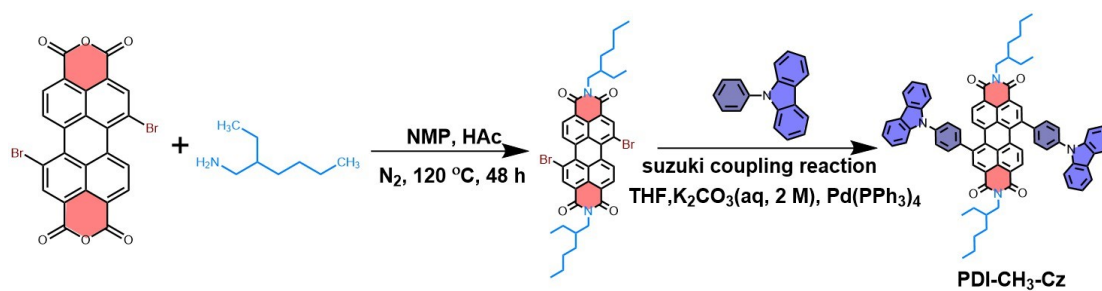
Fig. S6 Photodegradation and dark adsorption of different concentrations of BPA by PPDI-C

Fig. S7 The quenching experiment of PPDI-SO₃H in H₂O₂ generation under an O₂ atmosphere

Fig. S8 Time-dependent FTIR analysis of PPDI-SO₃H

Table S1. The comparison of the removal performance of PPDI-SO₃H toward BPA under visible light irradiation

1. Results and discussion



Scheme S1 The schematic illustration of the synthetic procedure of PDI-CH₃-Cz

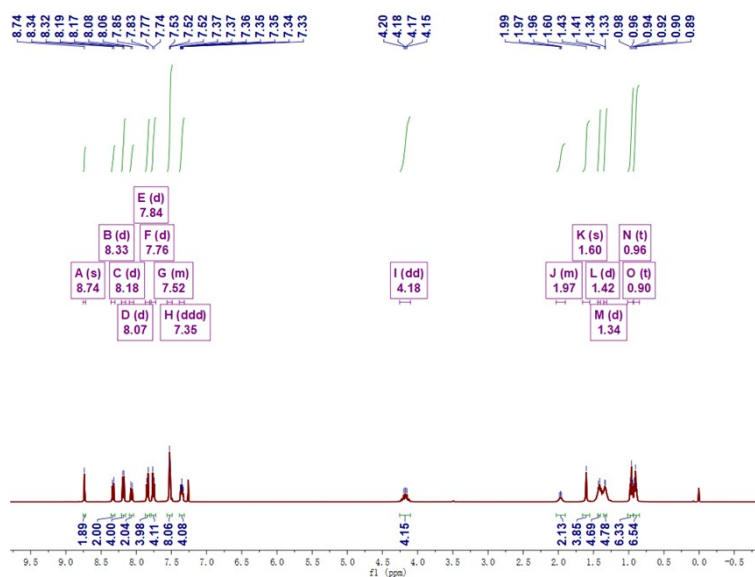


Fig. S1 The ¹H NMR spectrum of PDI-CH₃-Cz.

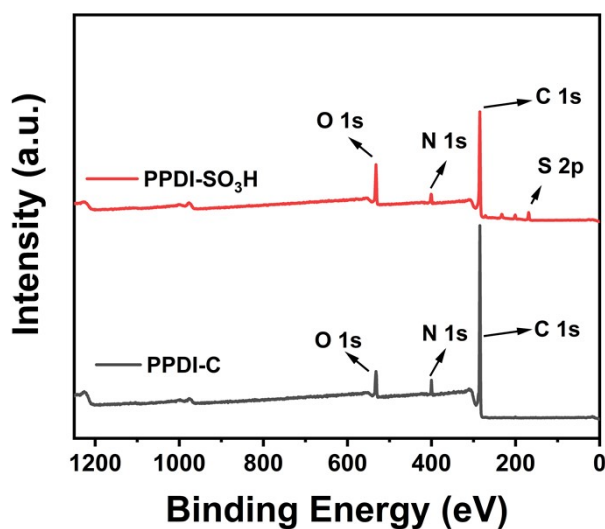


Fig. S2 The XPS spectra of PPDI-C and PPDI-SO₃H.

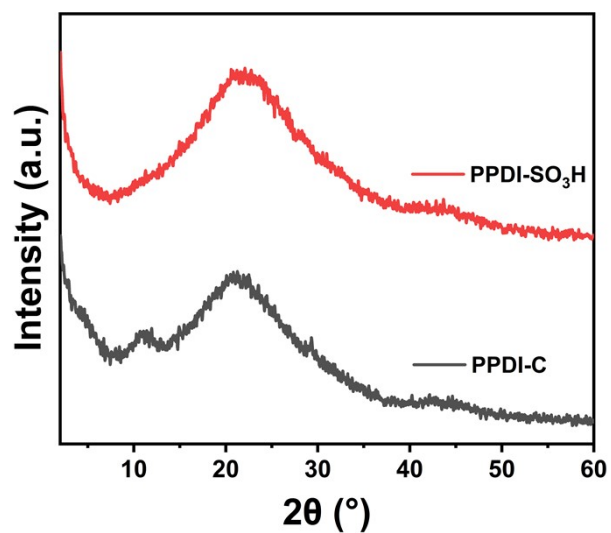


Fig. S3 The XRD curves of PPDI-C and PPDI-SO₃H.

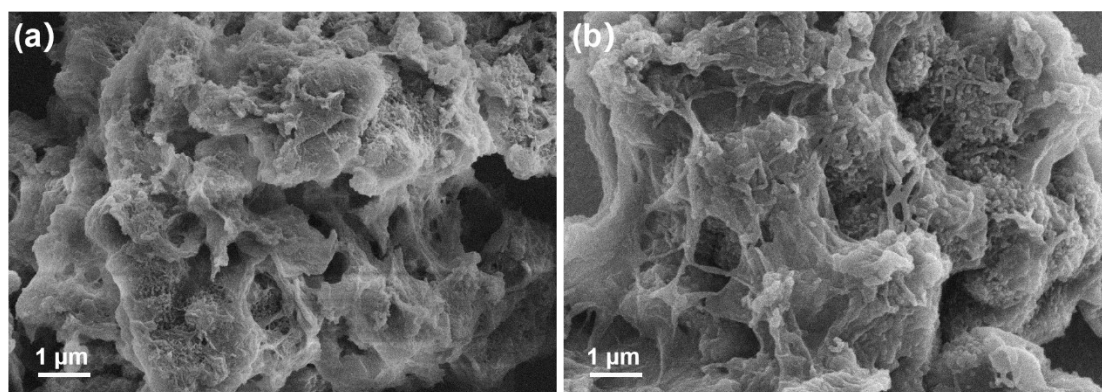


Fig. S4 The SEM images of (a) PPDI-C and (b) PPDI-SO₃H.

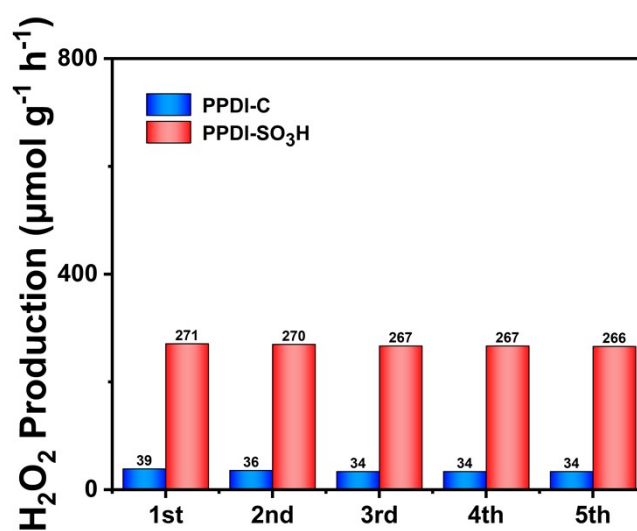


Fig. S5 Cyclic stability of H₂O₂ production over PPDI-SO₃H and PPDI-C.

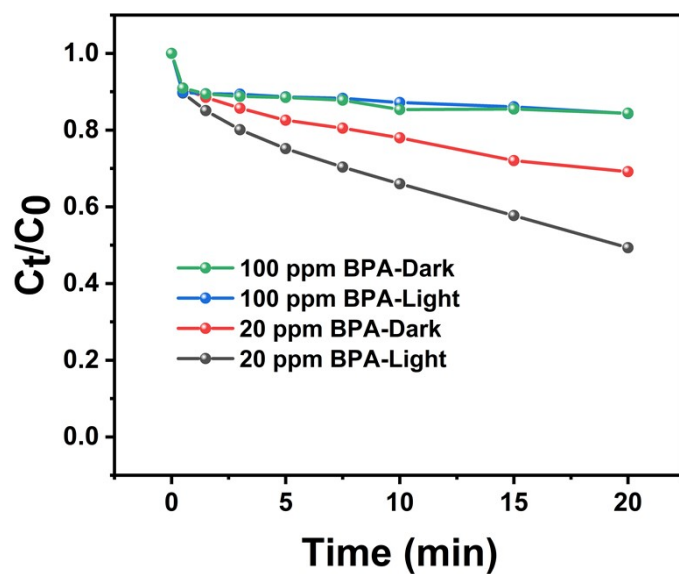


Fig. S6 The photodegradation and dark adsorption performance of PPDI-C toward BPA with different initial concentrations.

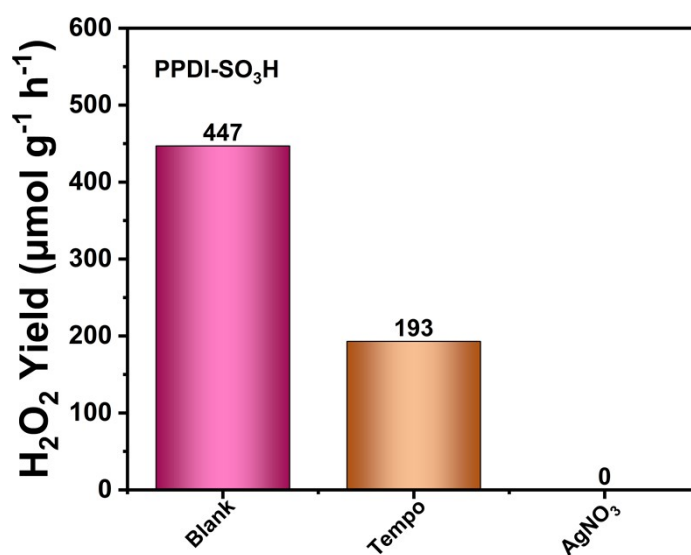


Fig. S7 The quenching experiment of PPDI-SO₃H in H₂O₂ generation under an O₂ atmosphere.

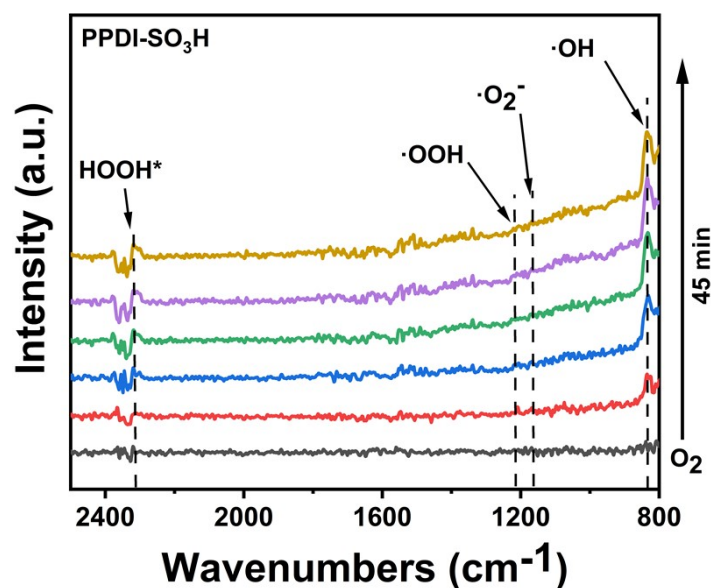


Fig. S8 Time-dependent FT-IR spectrum of PPDI-SO₃H.

Table S1. The comparison of the removal performance of PPDI-SO₃H toward BPA under visible light irradiation.

	Catalyst Name	Catalyst Dosage	Initial BPA Concentration	Degradation Efficiency	Corresponding Time	Reference
1	15%-In ₂ O ₃ /Cu-CN	100 mg	20 mg/L	91%	180 min	1
2	CoPorPc-CMP	25 mg	20 mg/L	75%	30 min	2
3	CBOI@BOB-6	25 mg	20 mg/L	93.6%	30 min	3
4	CdF@CM	100 mg	10 mg/L	97%	60 min	4
5	20-Co ₃ O ₄ /BOC	40 mg	10 mg/L	84%	175 min	5
6	Co-W ₁₈ O ₄₉ /PDI	25 mg	10 mg/L	91.2%	150 min	6
7	BOC/BOI-3	40 mg	15 mg/L	97%	90 min	7
8	BT-Ni ₂	50 mg	20 mg/L	61%	60 min	8
9	PPDI-SO ₃ H	5 mg	100 mg/L	97%	20 min	This work
		5 mg	20 mg/L	99%	10 min	

References

1. A. Uddin, A. Rauf, H. Luo, M. Basharat, M. Ikram, S. Zeb, M. Imran, Q.U. Hassan, Y. Gao, *Appl. Surf. Sci.*, 2023, **631**, 157531.
2. Q. Liu, Q. Sun, J. Shen, Y. Zhang, H. Li, Y. Zhang, Q. Li, G. Lu, S. Yu, X. Li, Y. Chen, *Appl. Surf. Sci.*, 2023, **638**, 158129.

3. J. Zhou, W. Zheng, F. Chen, S. Tu, H. Huang, *Sep. Purif. Technol.*, 2026,**383**, 136171.
4. M. Bilal, N. Abbas, K. Javed, Z. Mahmood, M.R.H. Shah Gilani, J.K. Ullah, S. Mahmood, S. Iqbal, K.A. Al-Hothaly, A.-E. Farouk, *Luminescence*, 2025, **40**, e70318.
5. S.T.U. Din, W.-F. Xie, W. Yang, *Int. J. Mol. Sci.*, 2022, **23**, 15028.
6. J. Liu, X. Gao, R. Wang, S. Zhu, X. Zhu, X. Zhu, D. Li, Q. Ruan, M. Cheng, B. Wang, H. Li, H. Xu, P.K. Chu, *Colloids Surf. A: Physicochem. Eng. Asp.*, 2024,**703**, 135050.
7. S.T.U. Din, H. Lee, W. Yang, *Nanomaterials*, 2022, **12**, 767.
8. I. Arora, S. Garg, A. Sapi, M. Yadav, A. Efremova, A. Szamosvölgyi, S. Upadhyay, U. Gupta, P.P. Ingole, M.M. Abdullah, *ACS Appl. Energy Mater.*, 2025, **8**, 13485–13498.