Supplementary Material

Pyrene-based fluorescent molecularly imprinted polymer for rapid and selective detection of oxytetracycline based on inner filter effect

Tianyi Zhu[a,c], Jian Zhang[a,b,*], Danyi He[a], Yiwen Yang[a], Hailong Wang[a], Jianbo Wang[a], Longhua Guo[a], Lei Li[a,], Jianrong Chen[c], Yanbo Zeng[a,*]

([a] Provincial Key Laboratory of Multimodal Perceiving and Intelligent Systems, Engineering Research Center of Intelligent Human Health Situation Awareness of Zhejiang Province, Jiaxing Key Laboratory of Molecular Recognition and Sensing, College of Biological and Chemical Engineering, Jiaxing University, Jiaxing 314001, PR China

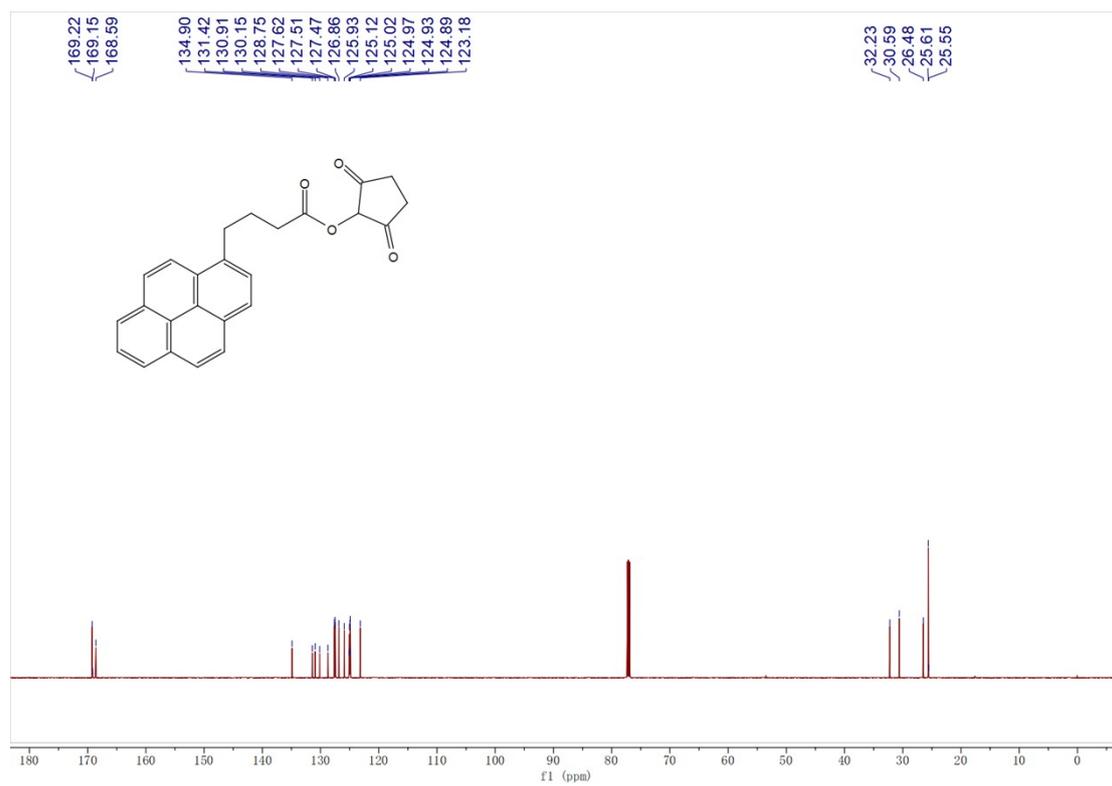[b] Analytical and Testing Center, Jiaxing University, Jiaxing 314001, PR China

[c] College of Chemistry and Materials Sciences, Zhejiang Normal University, Jinhua 321004, PR China)
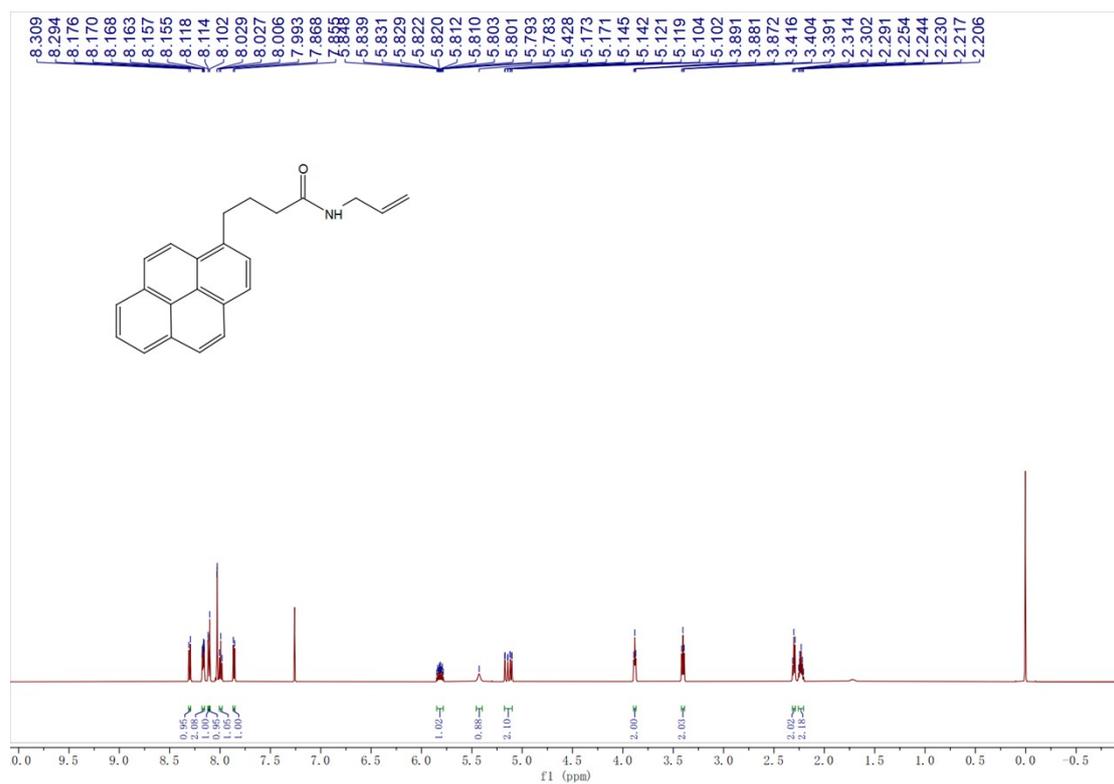

*Corresponding Author
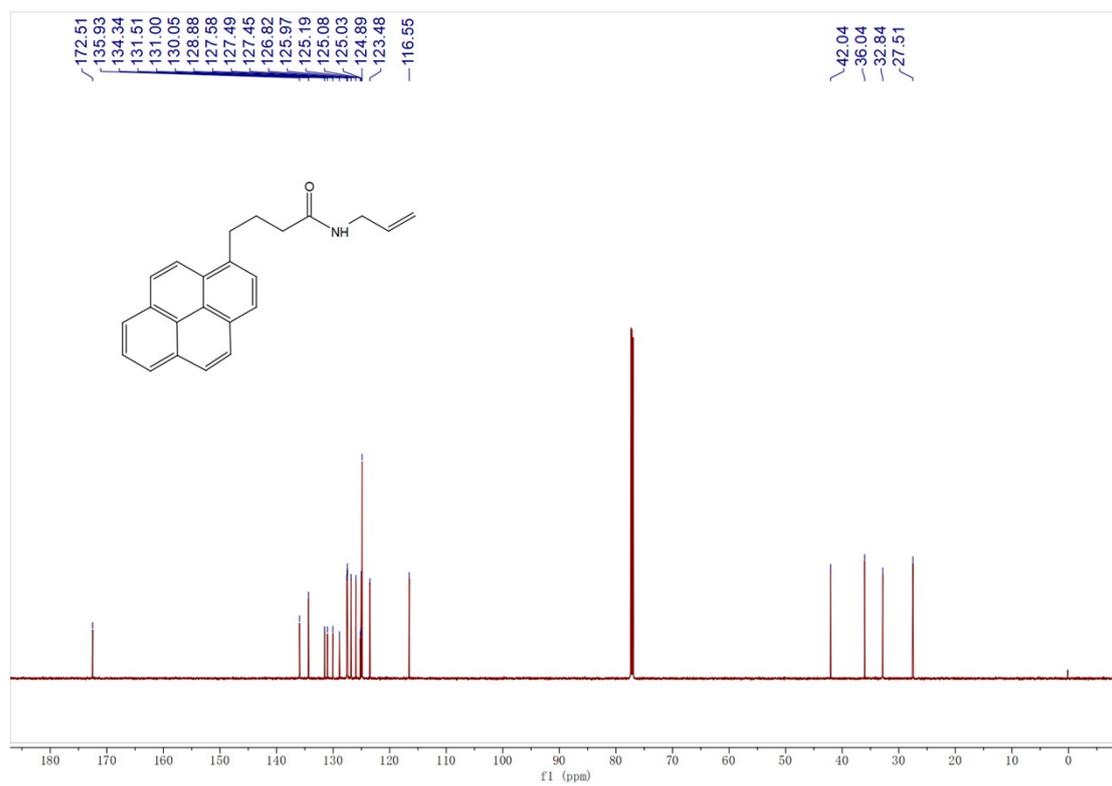
*E-mail: Jian.zhang@zjxu.edu.cn, ybzeng@mail.zjxu.edu.cn.
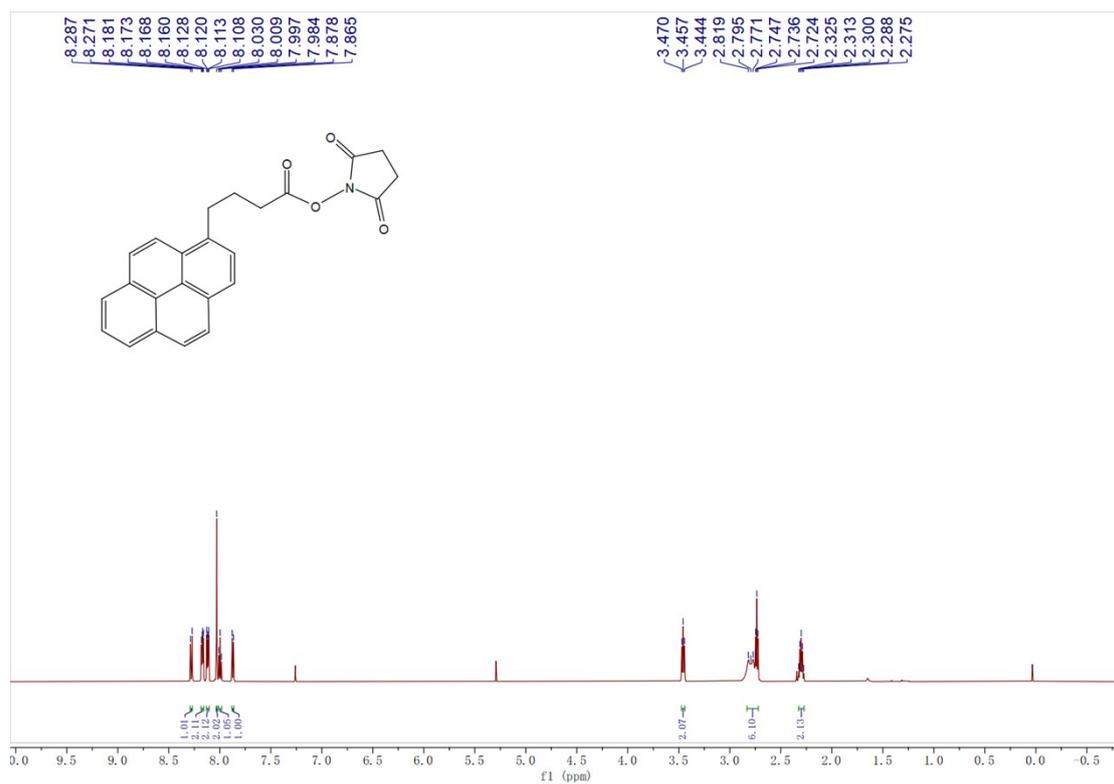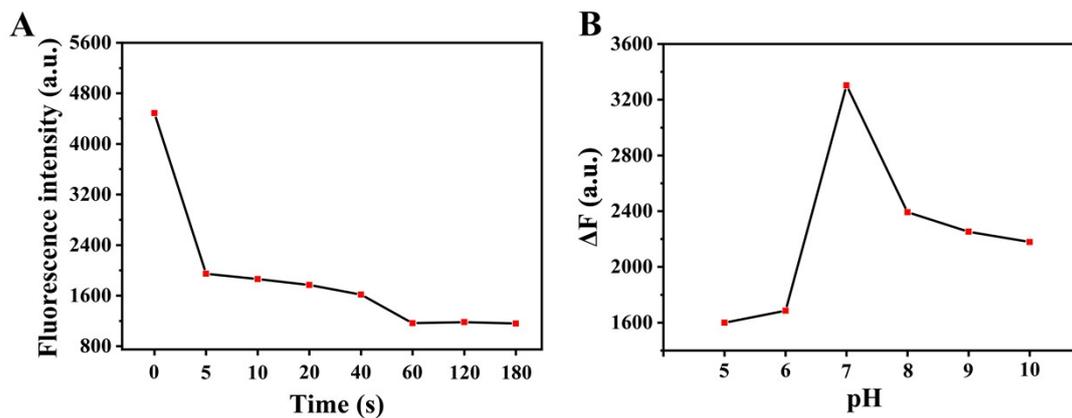
Fig. S1. ^{1}H-NMR spectrum of compound a.

Fig. S2. ^{13}C-NMR spectrum of compound a.

Fig. S3. ^{1}H-NMR spectrum of Al-Py.

Fig. S4. ^{13}C-NMR spectrum of Al-Py.

Fig. S5. (A) Fluorescence intensities of Py-FMIP with OTC at different time. (B) Effect of pH on ΔF. Condition: the OTC concentration was 100 μM.

Table S1 Cross-reactivity factor comparison of Py-FMIP sensor and other FL-MIPs sensors for antibiotics detection.

Fluorescence sensor	Target	Cross-reactivity factors	Ref.
$Cs_3Bi_2Br_9$@SiO_2-MIPs	OTC	3.5-3.8	1
IPQDs[a]@MIPs	Tetracyline	3.7-10.8	2
OH-HNTs[b]@N-GQDs[c]@Fe_3O_4@MIP	Marbofloxacin	3.0-5.3	3
Tb^{3+}-CdTe@SiO_2@MIPs	Ciprofloxacin	4.5-13.6	4
N-GQDs/ZnO*CF[d]/Fe_3O_4/MIP	Florfenicol	2.5-4.3	5
Py-FMIP	OTC	13.2-30.3	This work

a: inorganic halide perovskite quantum dots; b: hydroxylated-halloysite nanotubes; c: nitrogen-doped graphene quantum dots; d: carbon foam. The data of cross-reactivity factors of references 1 to 5 in Table S1 are cited from the literature[6].

References

1 X. Wei, Y. Gao, S. Zhang, A. Chen, J. Liu, F. Wang, I. Kerboua, M. Yan, J. Wang and Y. Zhang. Non-toxic $Cs_3Bi_2Br_9$ quantum dots molecular imprinted nanocomposite with boronate affinity and imprinting selectivity for selective detection of oxytetracycline, *J. Alloys Compd.*, 2024, 1002, 175329.

2 X. Wei, S. Zhang, T. Wang, A. Chen, J. Guo, B. Bai, S. Yang, Y. Li, X. Wang and X. Liu. Molecularly imprinted $CsPbBr_3$ quantum dot-based fluorescent sensor for trace tetracycline detection in aqueous environments, *J. Mater. Chem. C*, 2022, 10, 8432-8440.

3 A. Pongprom, N. Chansud, S. Sa-nguanprang, S. Jullakan and O. Bunkoed. Magnetic fluorescent probe of hydroxylated-halloysite and nitrogen-doped graphene quantum dots in molecularly imprinted polymer to enrich and determine marbofloxacin, *Microchem. J.*, 2023, 187, 108389.

4 X. Zhao, J. Yu, D. Lin, L. Han, B. Li, J. Chen, Y. Wu, Y. Huang, L. Chen and X. Wang. Visual detection of ciprofloxacin using a multi-emission ratiometric fluorescence sensor based on the molecularly imprinted polymers doped with terbium (III) ions, *Talanta*, 2025, 286, 127537.

5 J. Seangyai, N. Chansud and O. Bunkoed. A magnetic sensing probe of zinc oxide decorated carbon foam and nitrogen-doped graphene quantum dots in a selective polymer for the determination of florfenicol in milk, *J. Food Compos. Anal.*, 2023, 123, 105545.

6 R. Li, Z. Wang, Z. Li, H. Jia, J. Wang, Y. Wang, Y. Lu, J. Li and Q. Li. Recent progress in method development and application of fluorescent molecularly imprinted polymers in food analysis, *Trends Anal. Chem.*, 2026, 194, 118519.