

## Supporting Information

### **Label-free fluorescence aptasensor based on AIE effect and CoOOH for ultrasensitive detection of carcinoembryonic antigen**

Yulong Ju<sup>a</sup>, Qiukai Tang<sup>c</sup>, Yiwen Yang<sup>\*b</sup>, Yanbo Zeng<sup>b</sup>, Yunyun Zhai<sup>b</sup>, Hailong Wang<sup>b</sup>, Zuguang Li<sup>\*a</sup>, Lei Li<sup>\*b</sup>

<sup>a</sup> College of Chemical Engineering, Zhejiang University of Technology, Hangzhou 310014, Zhejiang, China

<sup>b</sup> College of Biological, Chemical Sciences and Engineering, Jiaying University, Jiaying 314001, Zhejiang, China

<sup>c</sup> Clinical Laboratory, Zhejiang Xin'an International Hospital, Jiaying 314031, Zhejiang, China

#### **Corresponding author:**

**Yiwen Yang**

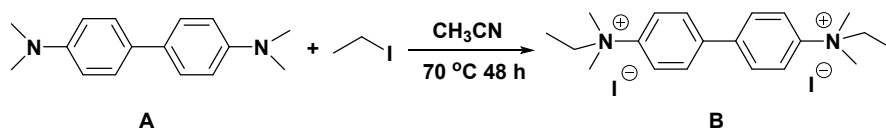
E-mail: [yangyiwen1002@126.com](mailto:yangyiwen1002@126.com)

**Zuguang Li**

E-mail: [lzg@zjut.edu.cn](mailto:lzg@zjut.edu.cn)

**Lei Li**

E-mail: [lei.li@mail.zjxu.edu.cn](mailto:lei.li@mail.zjxu.edu.cn)



**Scheme S1** Synthesis of Compound B

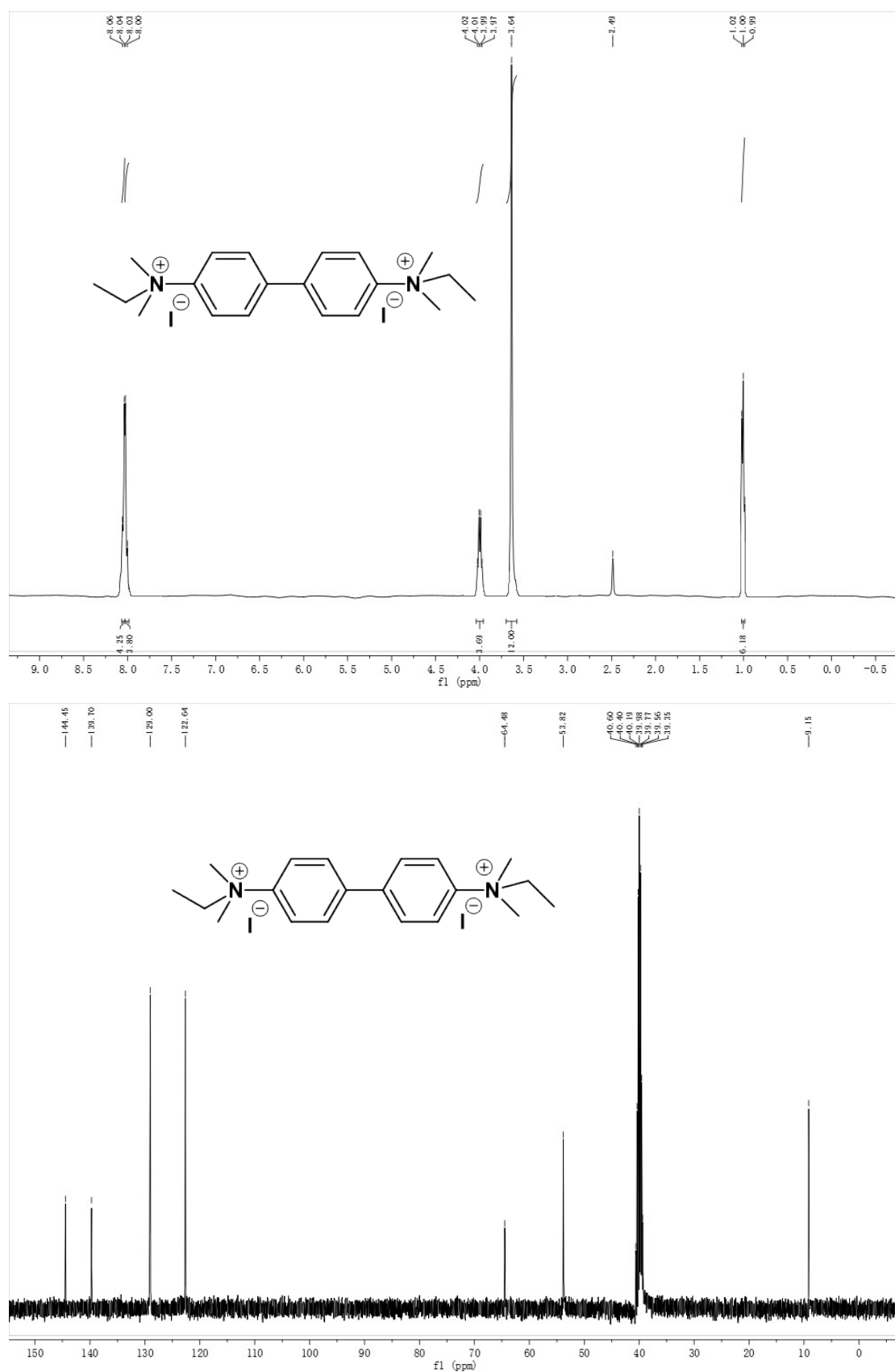


Fig. S1 <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra of Compound B

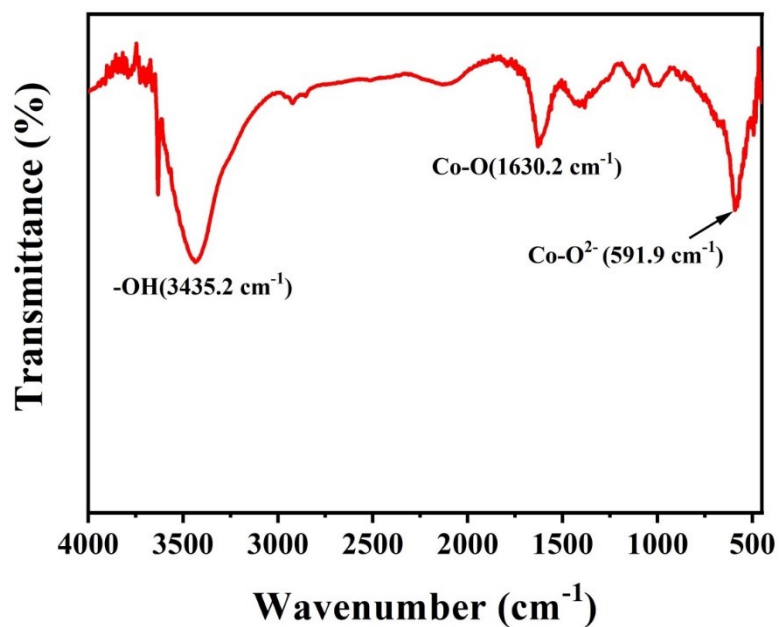


Fig.S2 IR spectra of CoOOH nanoflakes

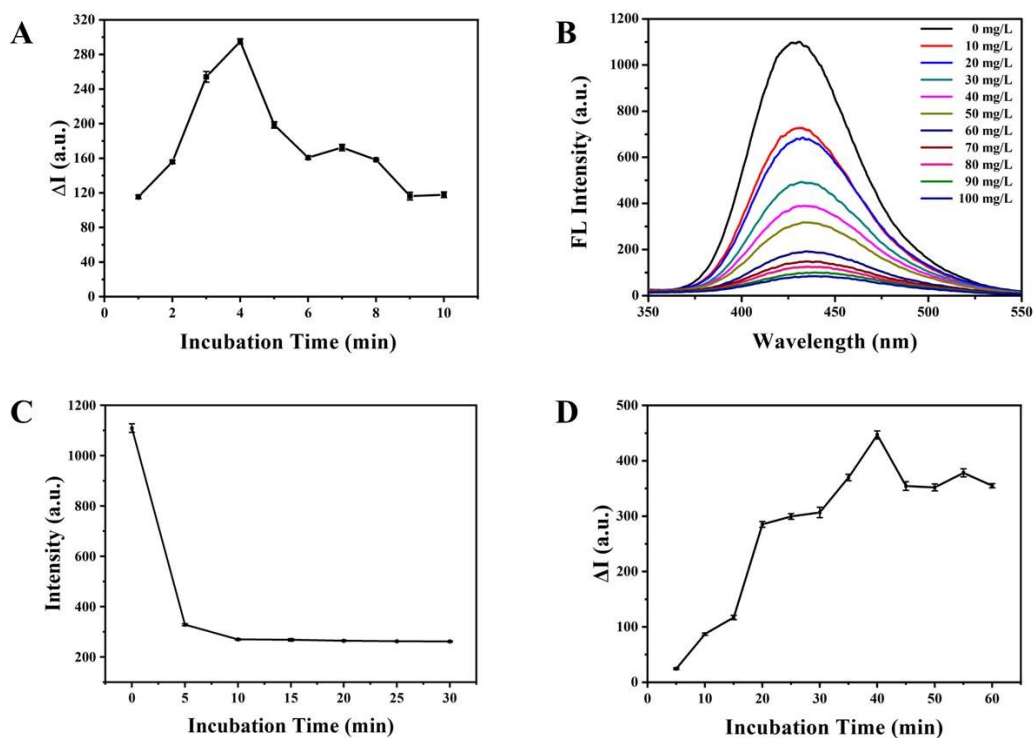


Fig.S3 (A) Effect of incubation time on fluorescence intensity of CEA-Apt/B complex; (B) Effect of CoOOH concentration on fluorescence intensity of the system ( $\lambda_{ex} = 294$  nm,  $\lambda_{em} = 431$  nm); (C) Effect of incubation time on fluorescence quenching; (D) Effect of incubation time on fluorescence recovery

**Table S1** Comparison between the proposed method and other methods for detecting CEA

No.	Method	LOD (ng/mL)	Linear range (ng/mL)	References
1	DMFC/Sensor	0.08	0.1–10 <sup>5</sup>	1
2	electrochemical immunosensor	0.05	0.1–5	2
3	PEC immunosensor	0.000468	0.0005–10	3
4	THz metamaterial biosensor	0.1	0.1–25	4
5	Chemiluminescence aptasensor	0.0015	0.01–100	5
6	Ag-coated Au tetrapod nanostars fluorescence probe	0.0082	0.01–0.28	6
7	Photoelectrochemical immunosensor	0.21	10–10 <sup>5</sup>	7
8	SERS immunosensor	3.3×10 <sup>-5</sup>	0.0001–100	8
9	Electrochemical biosensor	0.18	0.5–200	9
10	H–CdS-based PEC	0.00612	0.02–50	10
11	Label-free fluorescence aptasensor	0.0002	0.00067–10	This work

## References

1. L. P. T. Carneiro, N. S. Ferreira, A. P. M. Tavares, A. Pinto, A. Mendes and M. G. F. Sales, *Biosensors & Bioelectronics*, 2021, **175**, 112877.
2. M. Jozghorbani, M. Fathi, S. H. Kazemi and N. Alinejadian, *Analytical Biochemistry*, 2021, **613**, 114017.
3. K. Liu, H. Deng, Y. Wang, S. Cheng, X. Xiong and C. Li, *Sensors and Actuators B: Chemical*, 2020, **320**, 128341.
4. S. Lin, X. Xu, F. Hu, Z. Chen, Y. Wang, L. Zhang, Z. Peng, D. Li, L. Zeng, Y. Chen and Z. Wang, *IEEE Journal of Selected Topics in Quantum Electronics*, 2021, **27**, 1-7.
5. R. Han, Y. Sun, Y. Dai, D. Gao, X. Wang and C. Luo, *Sensors and Actuators B: Chemical*, 2021, **326**, 128833.
6. J.-J. Li, X.-H. Chen, G.-J. Weng, J. Zhu and J.-W. Zhao, *Materials Today Communications*, 2020, **25**, 101373.
7. X. P. Liu, J. S. Chen, C. J. Mao and B. K. Jin, *Analyst*, 2021, **146**, 146-155.
8. H. Medetalibeyoglu, G. Kotan, N. Atar and M. L. Yola, *Analytica Chimica Acta*, 2020, **1139**, 100-110.
9. H. Yang, J. Bao, D. Huo, Y. Zeng, X. Wang, M. Samalo, J. Zhao, S. Zhang, C. Shen and C. Hou, *Talanta*, 2021, **224**, 121816.
10. R. Zeng and D. Tang, *Talanta*, 2020, **219**, 121215.