Supporting information for

Dy(III)-coordination imprinted self-assembly microspheres based on the core of silica for highly sensitive and selective detection of two carbamate pesticides

Zerong Long ,[*a] Shilin Shen [a,b] and Hui Yuan [a]

[a] State Key Laboratory of Market Supervision, Xinjiang Uygur Autonomous Region Product Quality Supervision and Inspection Institute, Urumqi 830011, China

[b] School of Chinese Pharmacy, Xinjiang Medical University, Urumqi 830011, China

*Correspondence should be addressed to Zerong Long. (long8326rong@163.com; ORCID iD：0000-0002-4587-4014)

The supporting materials include:

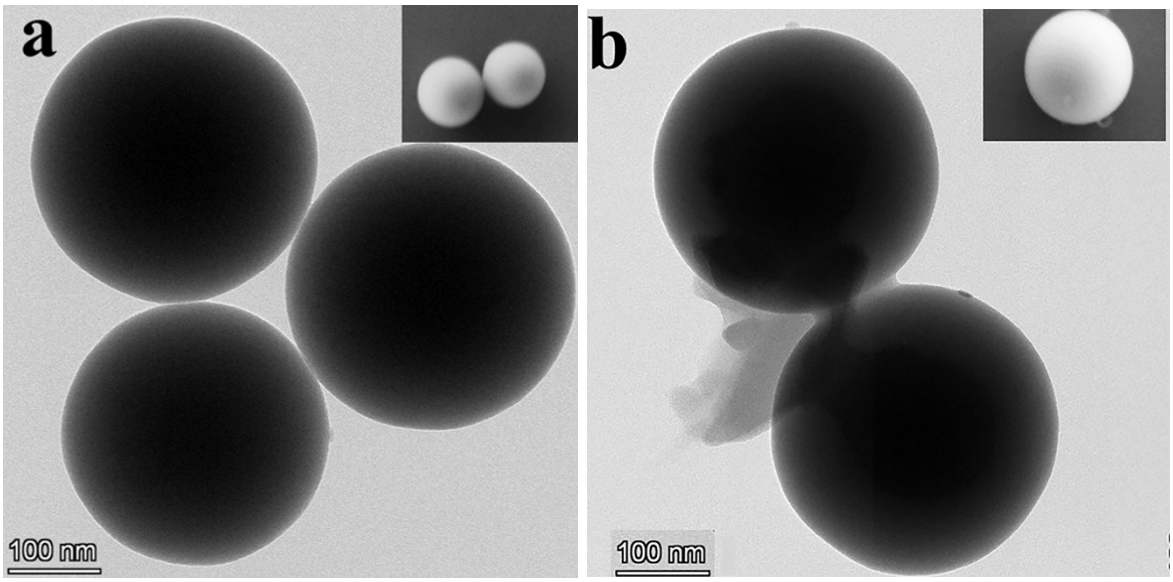

Fig S1. TEM images of (a) SiO_2@Dy(Phen)-MIPs for imprinted MC (MC-MIPs), and (b) SiO_2@Dy(Phen)-MIPs for imprinted PC (PC-MIPs). Inset is their individual SEM micrography.

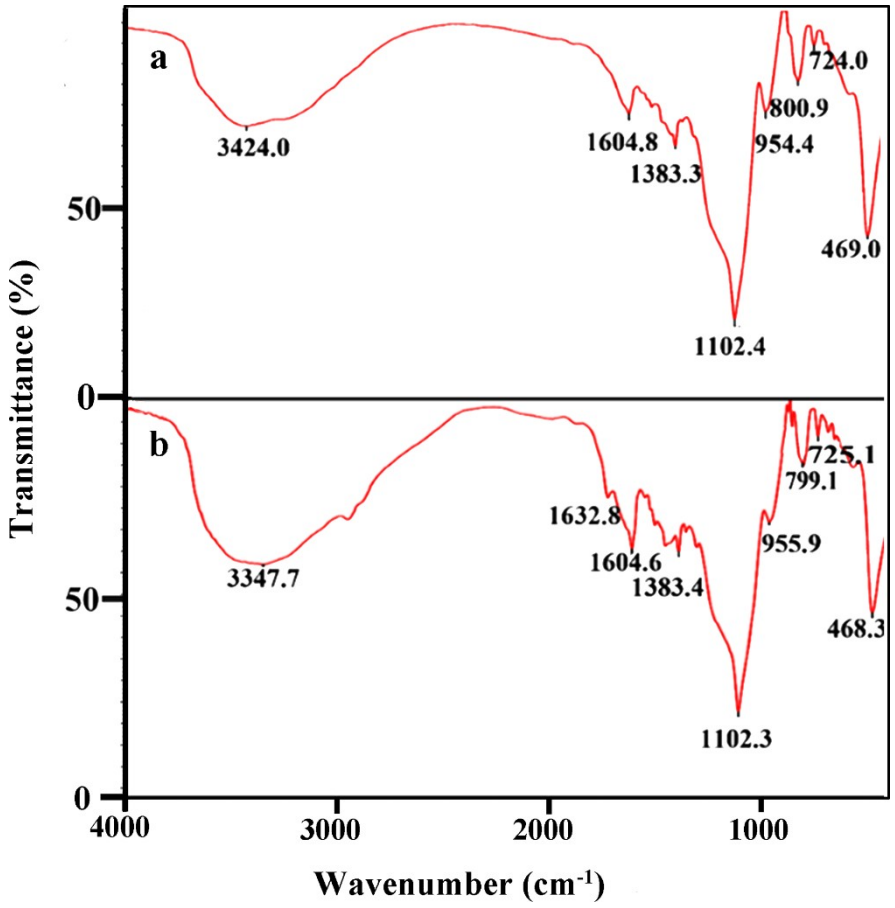

Fig S2. FT-IR spectra of (a) SiO_2@Dy(Phen)@CTS and (b) SiO_2@Dy(Phen)-DMIPs (DMIPs).

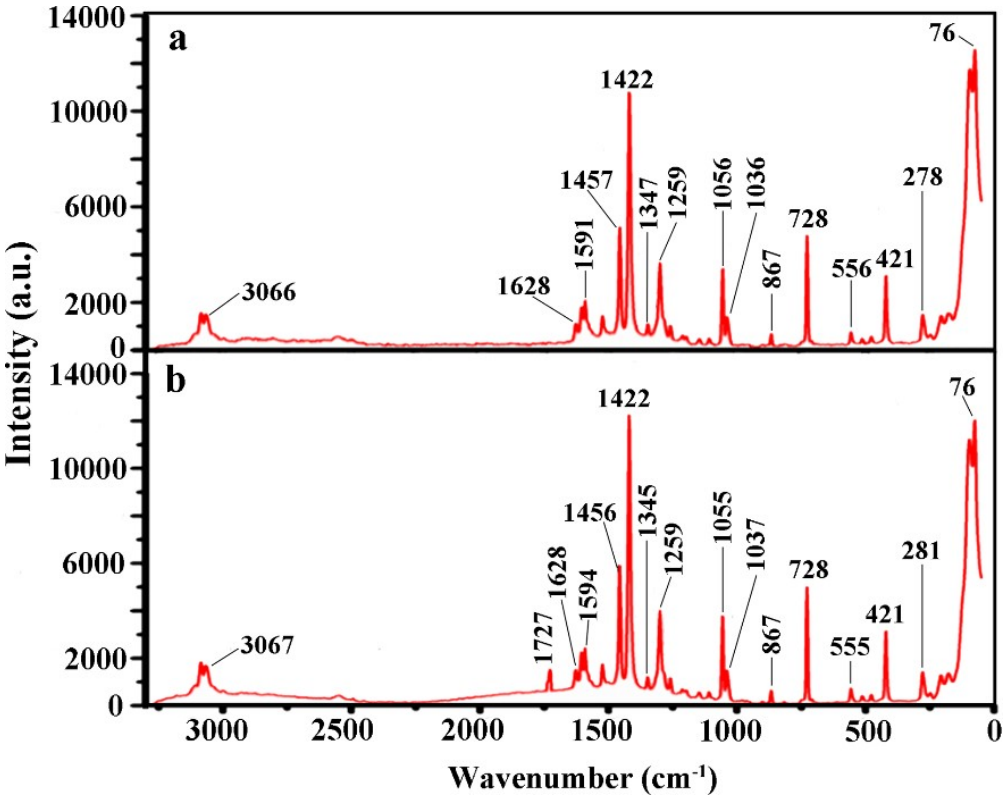

Fig S3. Raman Spectrum of (a) DMIPs and (b) PC and MC mixture loaded on DMIPs.

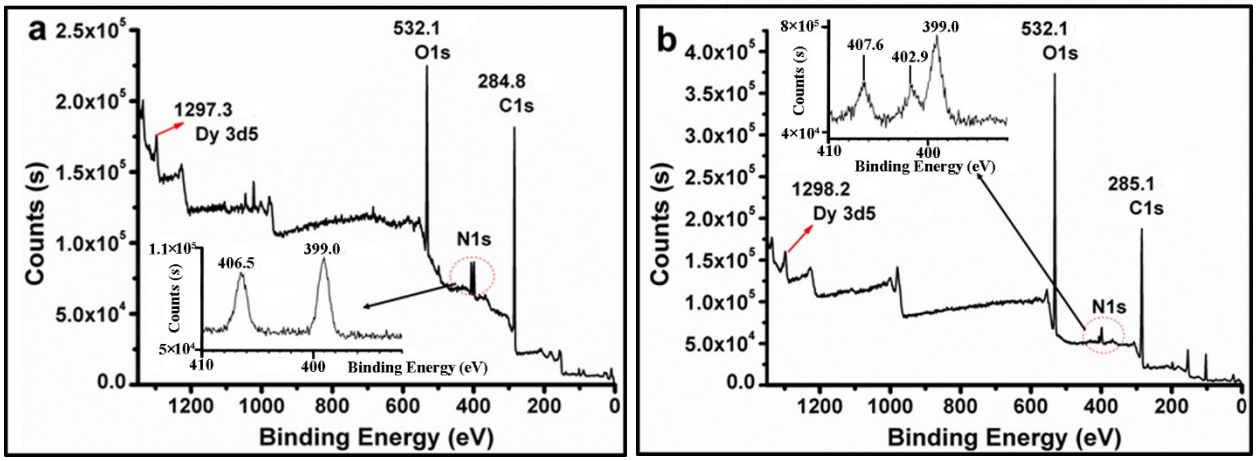

Fig S4. XPS spectra of (a) SiO_2@Dy(Phen) and (b) DMIPs

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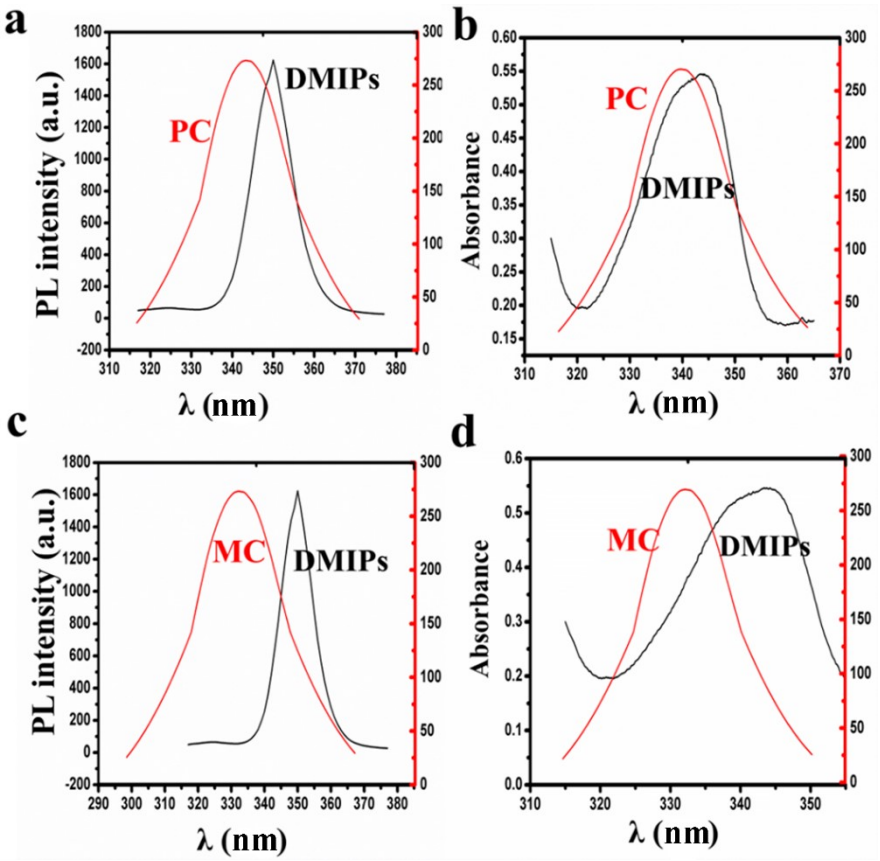

Fig S5. The overlap degree of (a) emission spectrum of MC (red line) and excitation spectrum of DMIPs (black line), (b) emission spectrum of MC (red line) and UV absorption spectrum of DMIPs (black line), (c) emission spectrum of PC and excitation spectrum of DMIPs and (d) emission spectrum of PC and UV absorption spectrum of DMIPs.

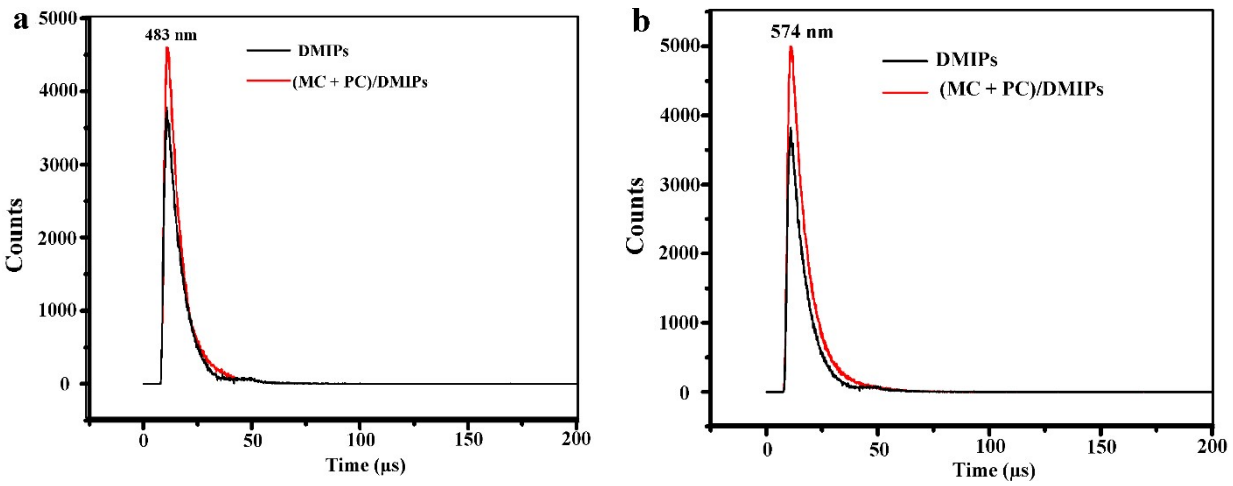

Fig S6. The fluorescence lifetime of DMIPs upon 30 ng mL^{-1} (a) MC at 483 nm, and (b) PC at 574 nm emission in the equal concentration mixture of MC and PC.

Table S1 Comparison of the proposed SiO_2@Dy(Phen)-MIP (DMIP) sensor with other analytical methods.

Material or method	Linear range (nM)		LOD (nM)		Ref
	MC	PC	MC	PC	
g-C_3N_4/GO/Fc-TED/GCE	45-2.1×10^5	/	8.3	/	[1]
cd-BELISA	0.06-6.0×10^3	/	0.8	/	[2]
SPME/CE-ECL	6.0-7.3×10^3	1.3-2.5×10^3	3.0	0.5	[3]
***MSPE-HPLC-UV**	3.0-6.0×10^2	4.2-4.2×10^2	0.6	0.9	[4]
QuEChERS/LC-MS	60-1.2×10^4	4.2-4.2×10^2	12.1	0.9	[5]
DMIP sensor	60-3.6×10^2	4.2-1.2×10^2	24.2	1.7	This study

***** nmol kg^{-1}；g-C_3N_4/GO/Fc-TED/GCE: graphitic carbon nitride/graphene oxide nanocomposite grafted on a ferrocene containing dendrimer glassy carbon electrode, cd-BELISA: a competitive direct biomimetic ELISA based on the metolcarb-imprinted film as the antibody mimic, SPME/CE-ECL: solid-phase microextraction combined with capillary electrophoresis equipped with column end electrochemiluminescence, MSPE-HPLC-UV: high-performance liquid chromatography (UV/Vis detector) with magnetic solid-phase extraction, QuEChERS/LC-MS: quick, easy, cheap, effective, rugged, and safe sample pretreatment method coupled with liquid chromatograph mass spectrometer.

Table S2 Influence of different concentrations of mixed standard solutions (PC+MC) on fluorescence lifetime of DMIPs.

Added (ng mL^{-1})	Fluorescence lifetime (μs) of MC/DMIPs at 483 nm	Fluorescence lifetime (μs) of PC/DMIPs at 574 nm
0	38.39	57.7
10	48.33	68.3
30	58.52	98.3

References

1 F. Xiao, H. Li, X. Zhang, M. Wang, C. Qian, Y. Wang, *Anal. Chim. Acta*, 2020, **1103**, 84-96.

2 Y. Tang, G. Fang, S. Wang, J. Sun, K. Qian, *J. AOAC Int*. 2013, **96(2)**, 453-458.

3 W. Zhang, F. Yang, Y. Zhang, K. Zhou, *Int. J. Electrochem. Sci*. 2021, **16**, 210652.

4 M. Sun, X. Ma, J. Wang, W. Wang, *J. Sep. Sci*. 2013, **36(8)**,1478-1485.

5 M. Li, Y. Jin, H.-F. Li, Y. Hashi, Y. Ma, J.-M. Lin, *J. Sep. Sci*. 2013, **36(15)**,2522-2529.