

Supplementary Materials

Lanthanide Molecular Species Generated $\text{Fe}_3\text{O}_4@\text{SiO}_2\text{-TbDPA}$ Nanosphere for the Efficient Determination of Nitrite

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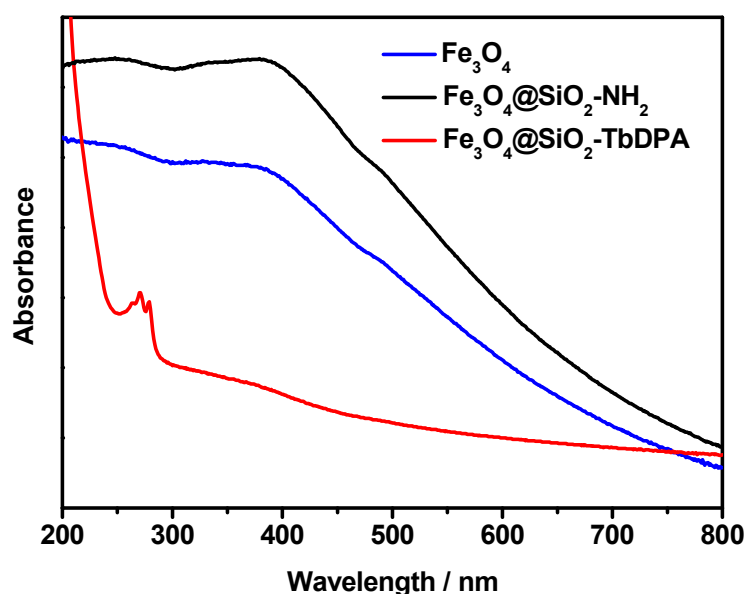


Figure S1. UV-Vis spectra of Fe_3O_4 , $\text{Fe}_3\text{O}_4@\text{SiO}_2\text{-NH}_2$ and $\text{Fe}_3\text{O}_4@\text{SiO}_2\text{-TbDPA}$ in aqueous solution.

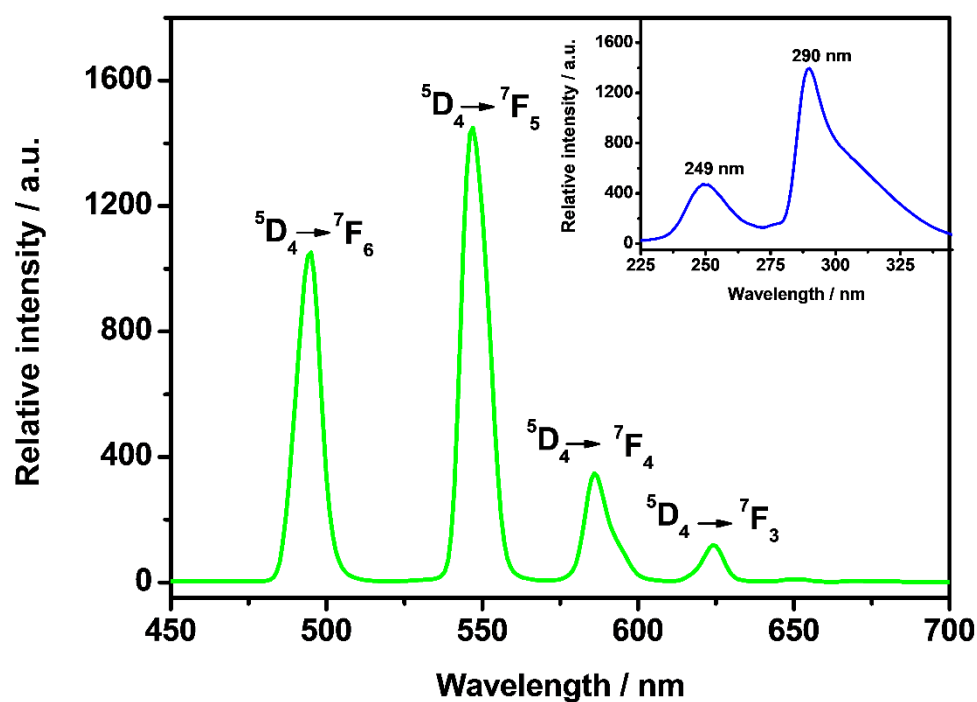


Figure S2. Emission spectra of $\text{Fe}_3\text{O}_4@\text{SiO}_2\text{-TbDPA}$ (0.1 mg/mL) in aqueous solution. (Inset: Excitation spectrum of $\text{Fe}_3\text{O}_4@\text{SiO}_2\text{-TbDPA}$) (emission wavelength at 546 nm).

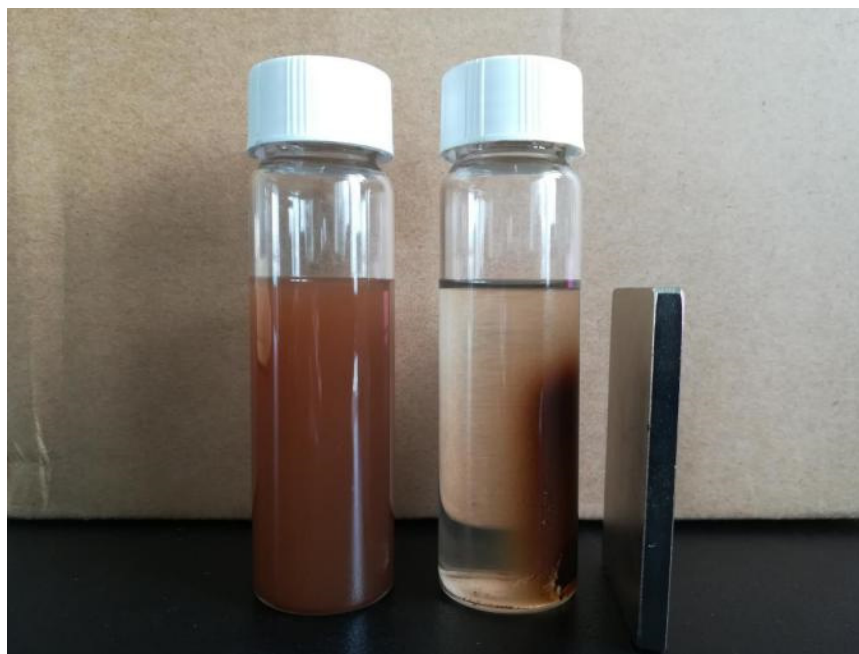


Figure S3. Photograph of a magnet attracting $\text{Fe}_3\text{O}_4@\text{SiO}_2\text{-TbDPA}$ in aqueous solution.

Table S1. Magnetic parameters of Fe₃O₄, Fe₃O₄@SiO₂-NH₂ and Fe₃O₄@SiO₂-TbDPA nanocomposite.

Samples	Ms(emu/g)	Hc(Oe)	Mr(emu/g)
Fe ₃ O ₄	0.163	33.856	0.00453
Fe ₃ O ₄ @SiO ₂ -NH ₂	0.099	26.332	0.00691
Fe ₃ O ₄ @SiO ₂ -TbDPA	0.075	18.809	0.00477

Table S2. Comparison between the current method and the reported literatures for the detection of nitrite.

Method	Materials	Detection limit	References
Surface-enhanced Raman spectroscopy	Fe ₃ O ₄ @SiO ₂ /Au	13.69 µM	[5]
Electrochemical	SiO ₂ /C/MnPc	0.79 µM	[7]
Electrochemical	Fe ₃ O ₄ -MWNTs	1.19 µM	[32]
Fluorescence	Fe ₃ O ₄ @ MCM-41	1.1 µM	[42]
Fluorescence	Fe ₃ O ₄ @Rh 6G	0.8 µM	[43]
Fluorescence	Carbon dots	0.65 µM	[44]
Fluorescence	Graphene quantum dot	9.8 µM	[45]
Fluorescence	Carbon dots	30 µM	[46]
Fluorescence	UiO-66-NH ₂	77 µM	[47]
Fluorescence	Fe ₃ O ₄ @SiO ₂ -DPA	1.03 µM	This work

Table S3. Results of determination of nitrite in tap water (n=3).

Sample number (No.)	Nitrite added (µM)	Nitrite found (µM)	Recovery (%)	RSD (%)
No. 1	5	4.8	96	2.2
No. 2	10	10.8	108	2.7
No. 3	30	29.1	97	3.1
No. 4	50	50.5	101	2.8