Supplementary Information

Triphenylamine derived Schiff base for sequential fluorescent 'On-Off-On' detection of iron(III) and biogenic amines

Kanishk Bhardwaj[a], Shubham Kumar[a], Ritambhara Jangir[a], Bigyan Ranjan Jali[b] and Suban K. Sahoo[a]*

[a] Department of Chemistry, Sardar Vallabhbhai National Institute Technology, Surat-395007, Gujarat, India.

[b] Department of Chemistry, Veer Surendra Sai University of Technology, Burla, Sambalpur-768018, Odisha, India

*E-mail: sks@chem.svnit.ac.in; subansahoo@gmail.com.

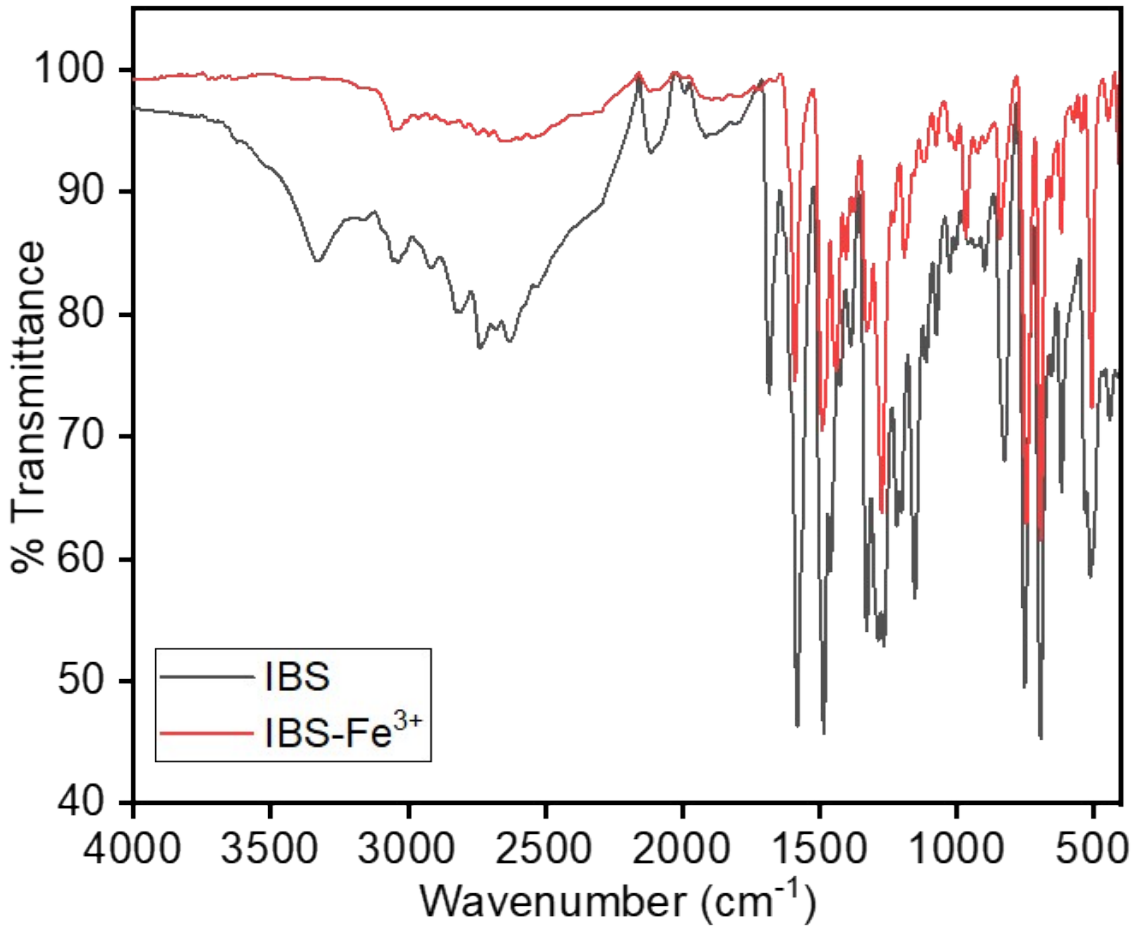


Fig. S1. FT-IR spectra of IBS and IBS-Fe^{3+} complex.

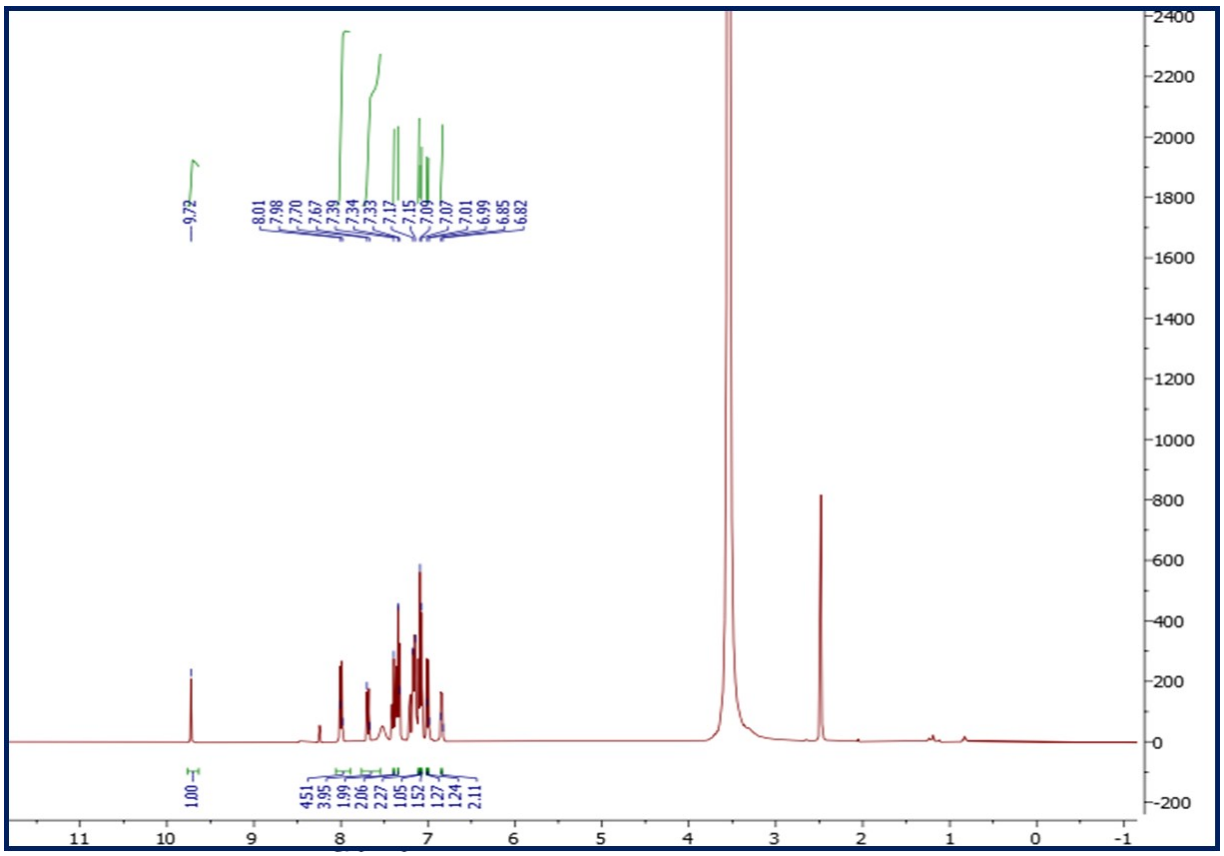


Fig. S2. ^{1}H NMR spectra of IBS in DMSO-d_6

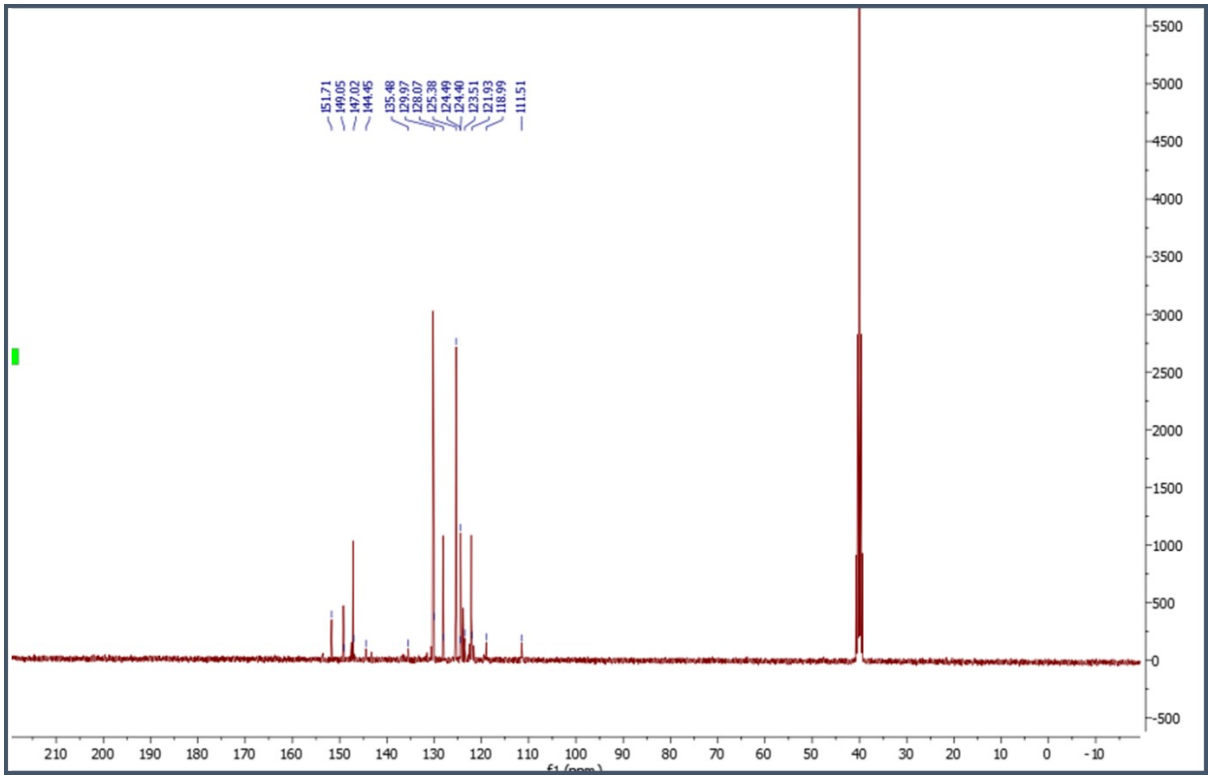


Fig. S3. ^{13}C NMR spectra of IBS in DMSO-d_6

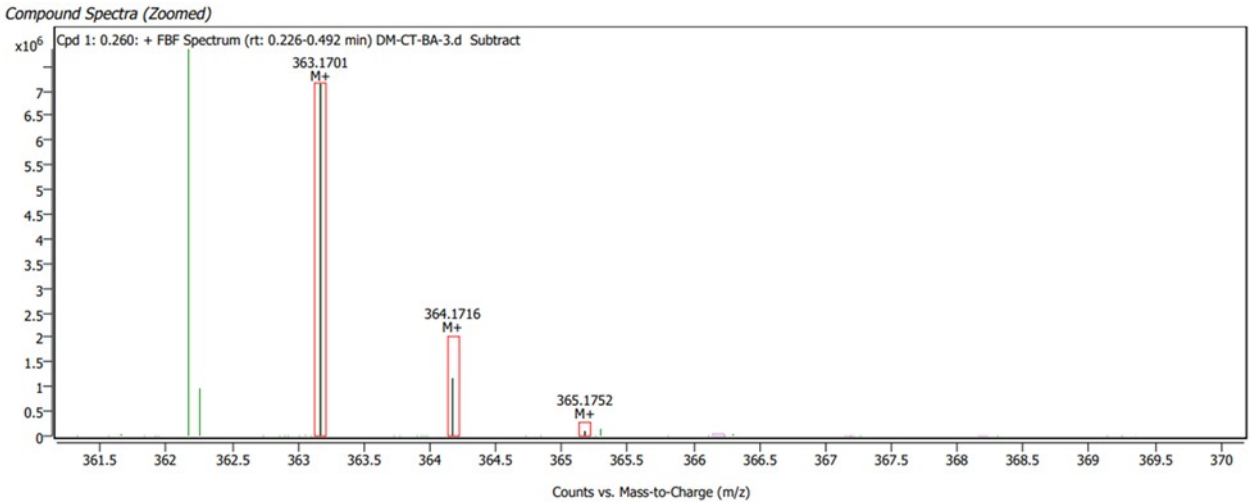


Fig. S4. HRMS spectrum of IBS.

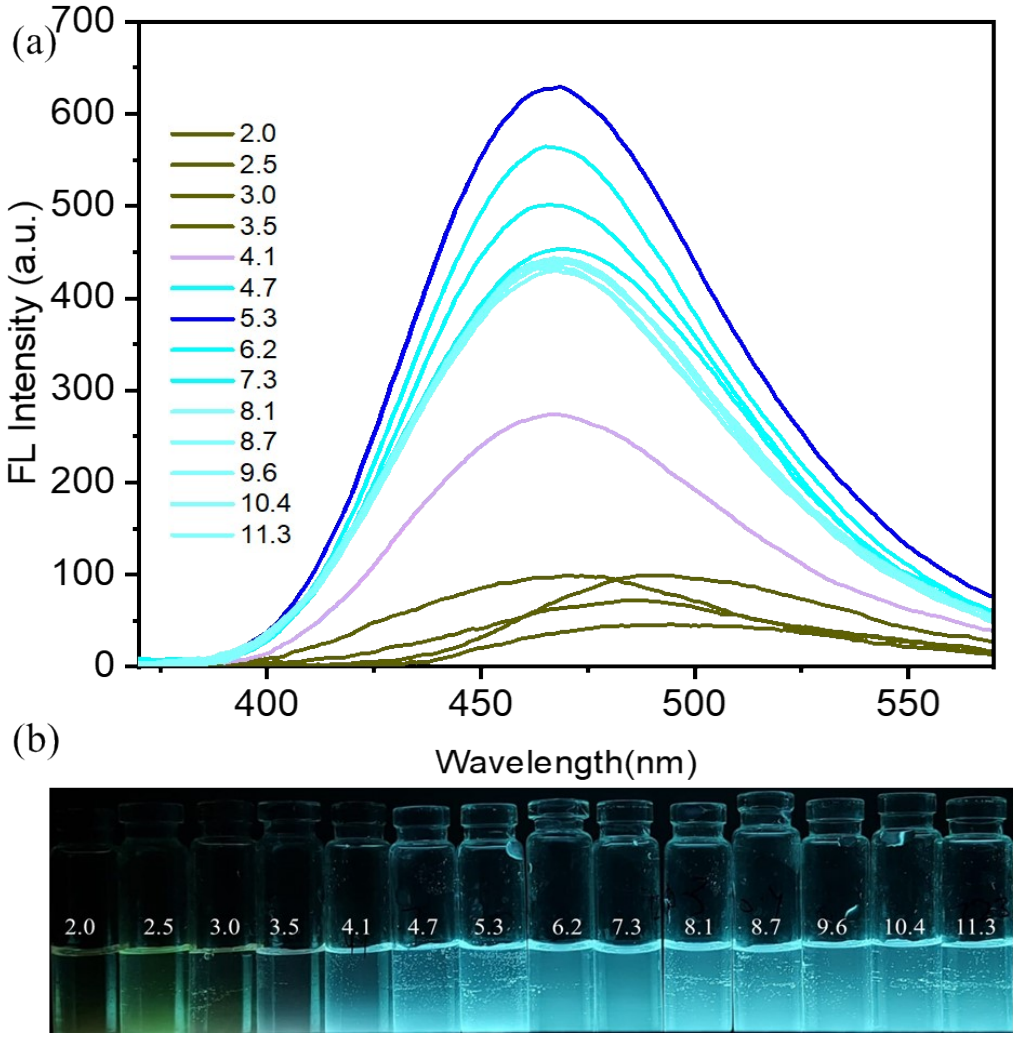


Fig. S5. (a) Fluorescence spectral changes of the aggregates of IBS at different pH. (b) Color changes of the aggregates of IBS at different pH under a U.V. lamp (365 nm).

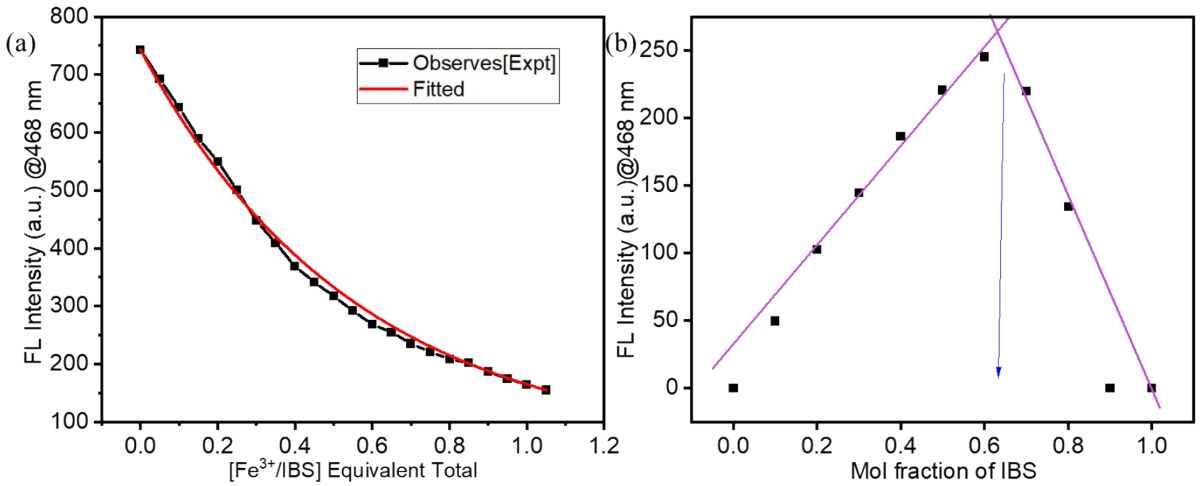


Fig. S6. (a) The bindfit plot to estimate K_a for IBS with Fe^{3+} and (b) Job's plot of IBS with Fe^{3+}.

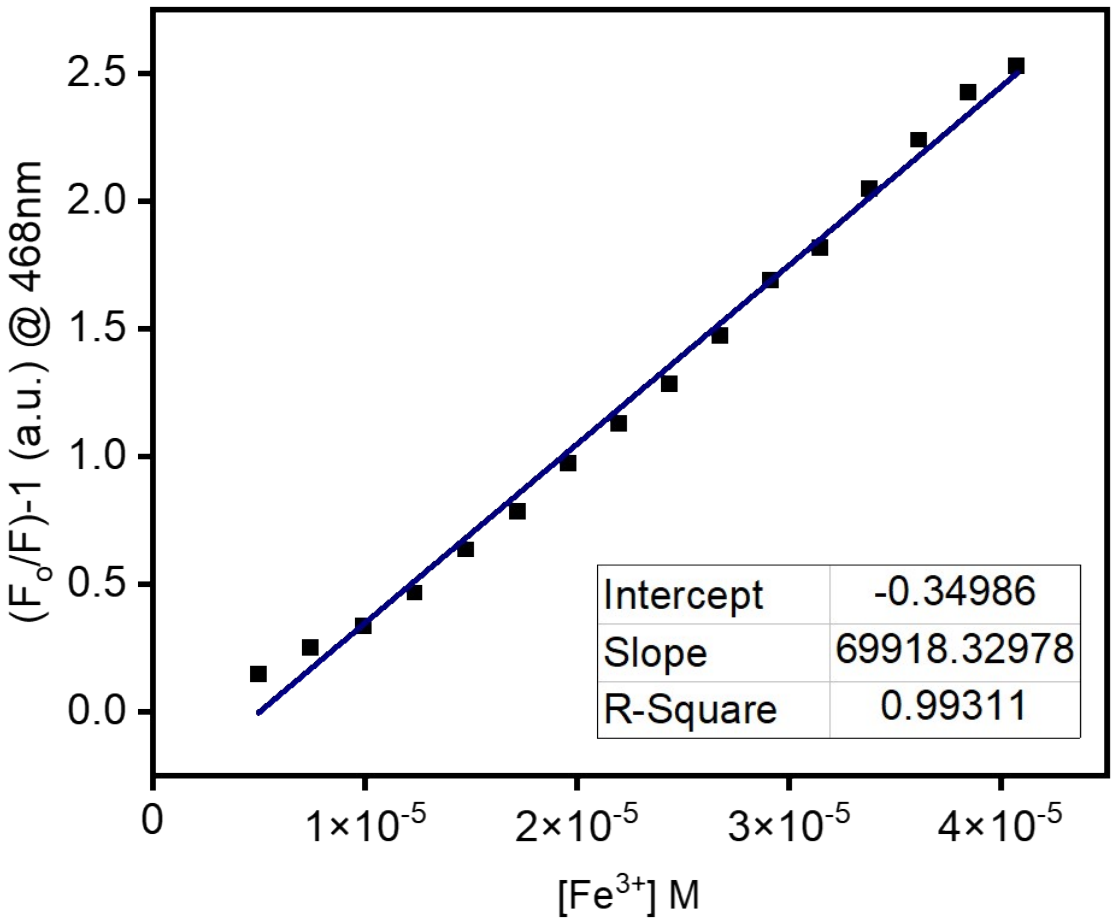


Fig. S7. Stern-Volmer plot of IBS with Fe^{3+} ion.

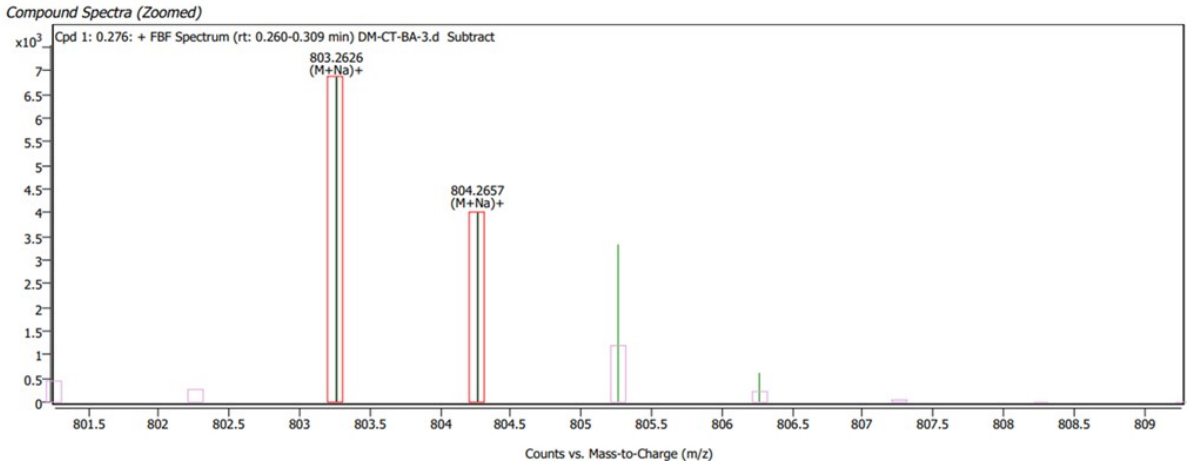


Fig. S8. HRMS spectrum of IBS-Fe^{3+} complex.

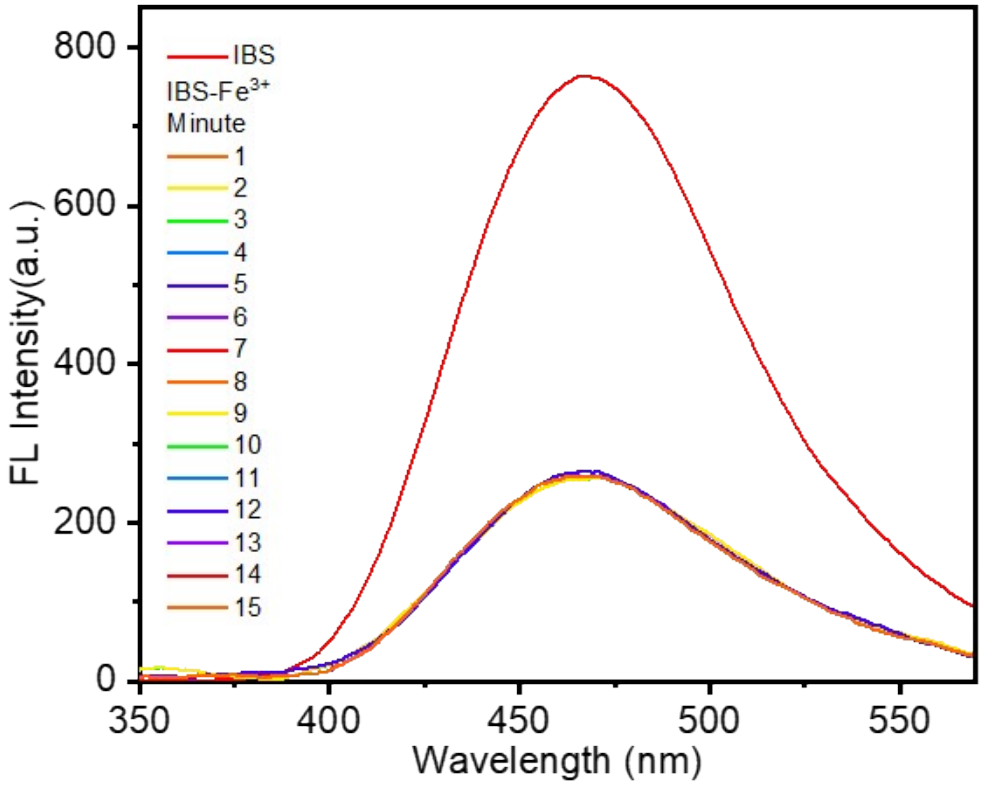


Fig. S9. Time-dependent fluorescence spectra of IBS after adding Fe^{3+}.

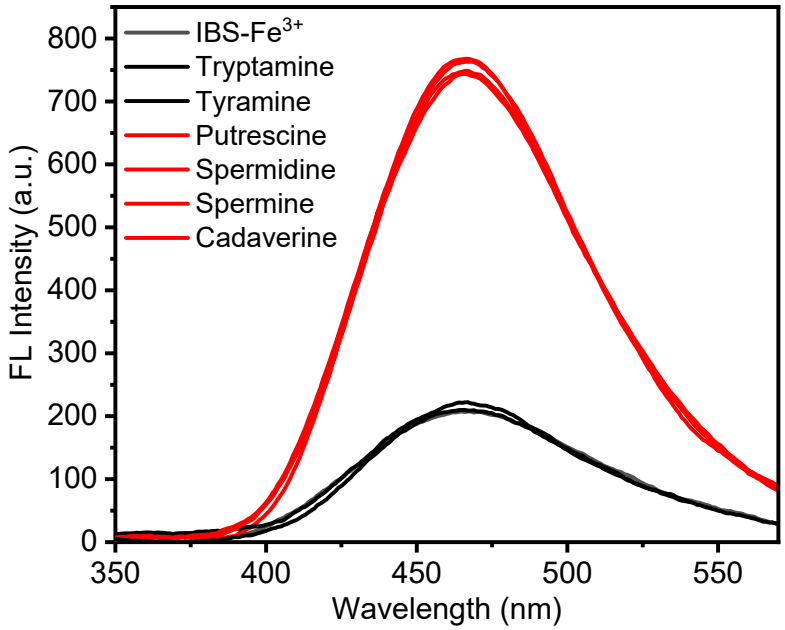


Fig. S10. (a) Fluorescence selectivity spectra of AIEgen IBS-Fe^{3+} upon addition of various BAs (100 μL, 1.25×10^{-5} M) in DMSO/H_2O mixtures (H_2O *fw* 60%).

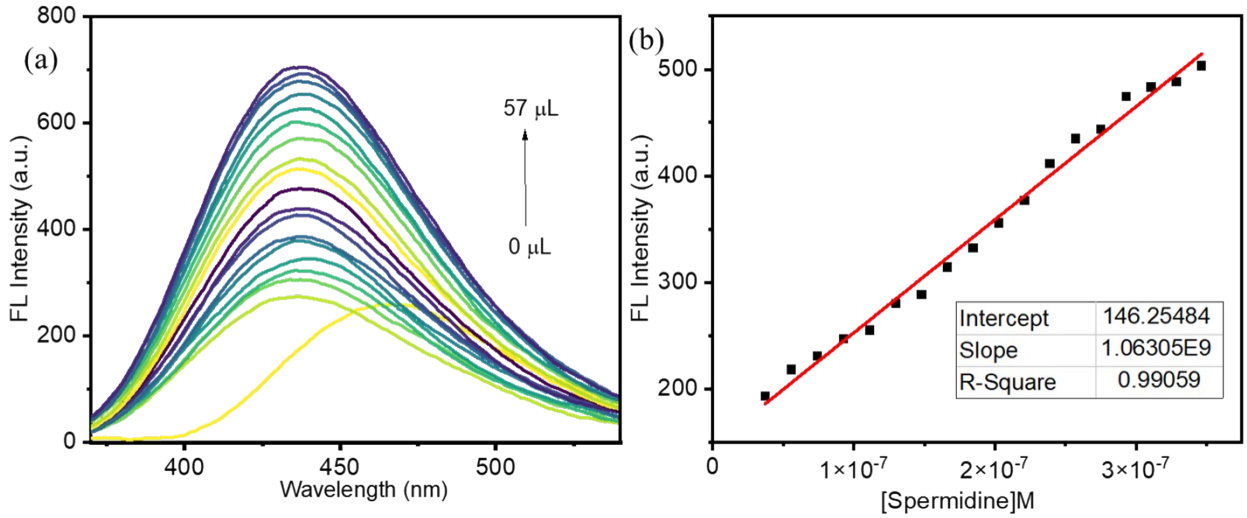
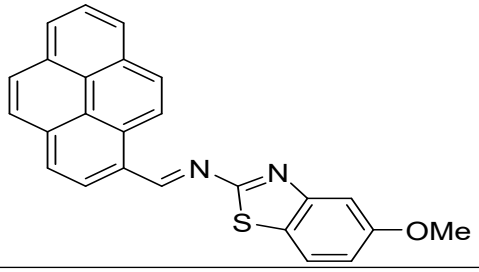
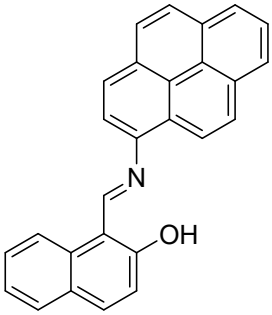
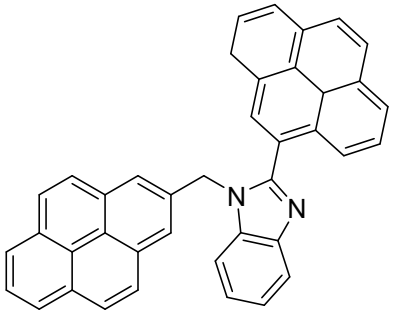
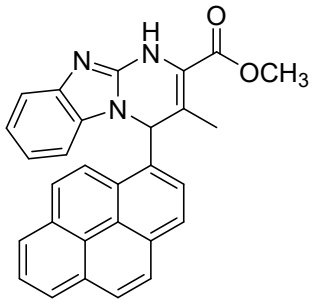
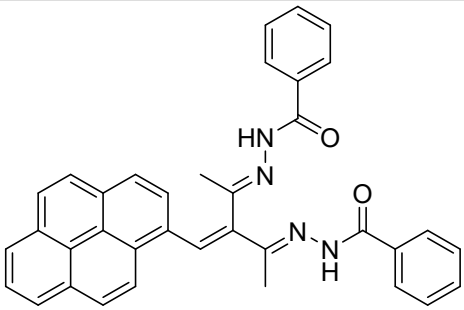


Fig. S11. (a) Fluorescence intensity of IBS-Fe^{3+} complex upon addition of different volumes of spermidine (0-57 μL of 1.25×10^{-5} M) (λ_{ex}= 300 nm) (b) Fluorescence of AIEgen IBS-Fe^{3+} versus concentration of spermidine solution.

Table S1. Comparison of our sensor with reported fluorescent turn-off Fe^{3+} sensors.

Fluorescent sensors	Medium	LOD	Ref.
	H_2O	2.61 μM	[1]
	Aqueous buffer/Ethanol	3.19 μM	[2]
	DMSO/ H_2O	1.81 μM	[3]
	CH_3CN	7.94 μM	[4]
	DMSO/HEPES buffer	1.67 μM	[5]

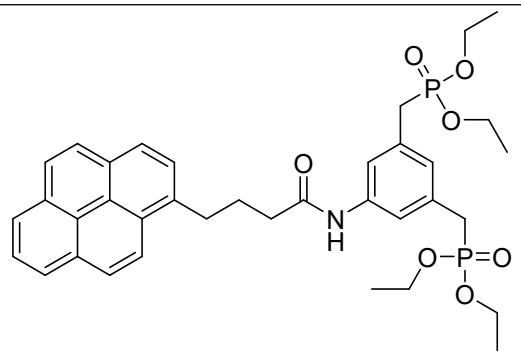
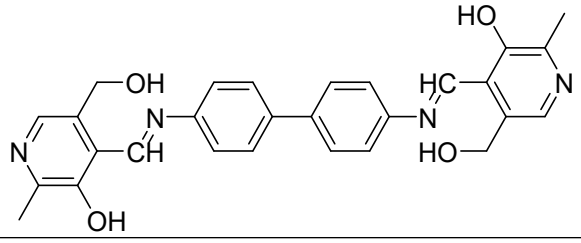
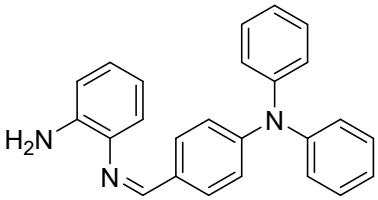
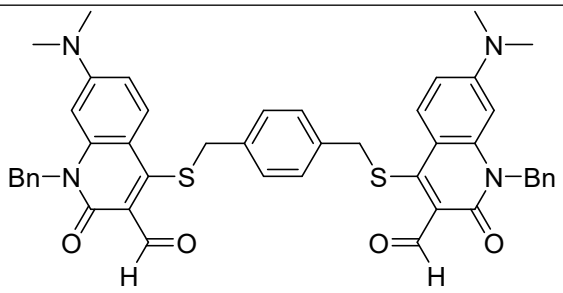
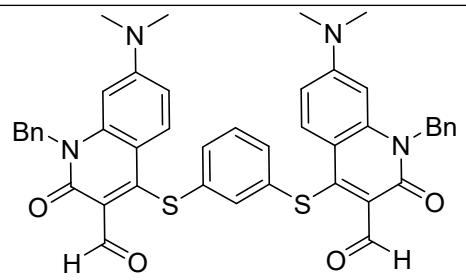
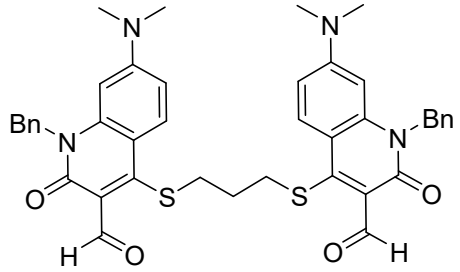
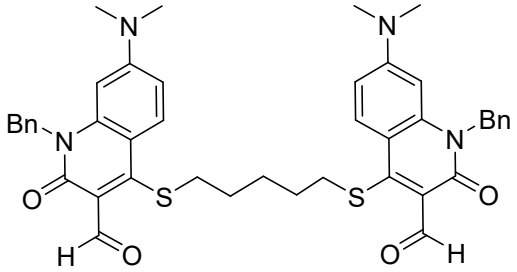
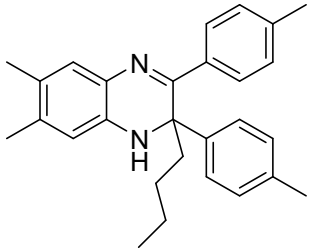
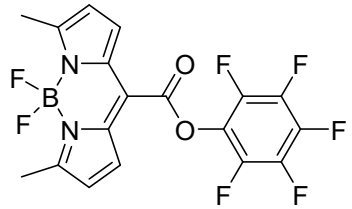
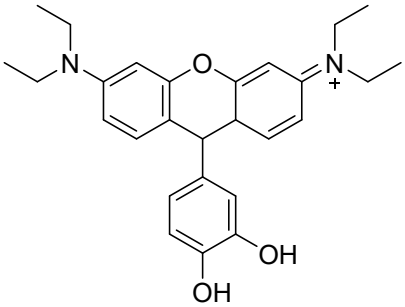
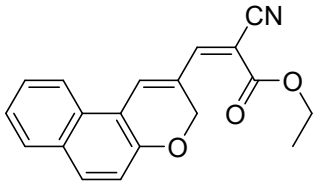
	CH_3CN / H_2O	0.99 μM	[6]
	DMSO/ H_2O	0.56 μM	[7]
 **IBS**	DMSO/ H_2O	0.219 μM	This work

Table S2. Comparison of our sensor with reported fluorescent biogenic amines sensors.

Fluorescent sensors	Sensing medium	LOD range	Ref.
	MeOH-HEPES	μM	[8]
	MeOH-HEPES	μM	

	MeOH-HEPES	μM	
	MeOH-HEPES	μM	
	Filter paper strips	ppb	[9]
	Acetonitrile	nM	[10]
	Acetonitrile	μM	[11]
	EtOH-H_2O	μM	[12]
IBS-Fe^{3+} complex	DMSO-H_2O	nM	This work

References

1. W. Zhang, Y. Luo, Y. Zhou, M. Liu, W. Xu, B. Bian, Z. Tao and X. Xiao, *Dyes Pigm.*, 2020, **176**, 108235.
2. D. Aigner, S. A. Freunberger, M. Wilkening, R. Saf, S. M. Borisov and I. Klimant, *Anal. Chem.*, 2014, **86**, 9293-9300.
3. P. Rasin, M. M. Mathew, V. Manakkadan, V. N. V. Palakkeezhillam and A. Sreekanth, *J. Fluoresc.*, 2022, **32**, 1229-1238.
4. T. Raj, P. Saluja and N. Singh, *Sens. Actuators B Chem.*, 2015, **206**, 98-106.
5. R. Dhivya, A. Gomathi and P. Viswanathamurthi, *J. Fluoresc.*, 2019, **29**, 797-802.
6. S. D. Padghan, R. S. Bhosale, S. V. Bhosale, F. Antolasic, M. Al Kobaisi and S. V. Bhosale, *Molecules*, 2017, **22**, 1417.
7. K. Bhardwaj, T. Anand, R. Jangir and S. K. Sahoo, *J. Fluoresc.*, 2023, 1-10.
8. K. Secor, J. Plante, C. Avetta and T. Glass, *J. Mater. Chem.*, 2005, **15**, 4073-4077.
9. L. Wang, X. Ran, H. Tang and D. Cao, *Dyes Pigm.*, 2021, **194**, 109634.
10. S. Jeon, T.-I. Kim, H. Jin, U. Lee, J. Bae, J. Bouffard and Y. Kim, *J. Am. Chem. Soc.*, 2020, **142**, 9231-9239.
11. M. K. Noushija, A. V. Krishna, R. T. M. Ali and S. Shanmugaraju, *Sens. Diagn.*, 2025, **4**, 293-309.
12. Y. Li, X. Jiang, Y. Li, X. Yan, L. Tang, X. Sun, K. Zhong, X. Li and J. Li, *Food Chem.*, 2024, **458**, 140239.