Electronic Supplementary Information (ESI)

Dimethoxy triarylamine-derived terpyridine-zinc complex: a fluorescence light-up sensor for citrate detection based on the aggregation-induced emission

Tao Jiang, Niannian Lu, Yandi Hang, Ji Yang, Ju Mei,* Jian Wang, Jianli Hua* and He Tian

Key Laboratory for Advanced Materials, Institute of Fine Chemicals, School of chemistry and Molecular Engineering, East China University of Science and Technology, 200237, Shanghai, China.

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S1. Fig. S1

Fig. S1 Scanning electronic microscope (SEM) image of DTPA-TPY in the THF/H$_2$O mixture ($f_w$ = 90 vol%, containing 1 vol% DMSO).

S2. Fig. S2

Fig. S2 (a) Emission spectra of DTPA-TPY-Zn in the THF/H$_2$O mixtures with different water fractions (containing 1 vol% DMSO). (b) Plot of maximum emission intensity of DTPA-TPY-Zn versus water fraction in the aqueous mixture. Dye concentration: 100 µM. Excitation wavelength: 410 nm.
S3. Fig. S3

Fig. S3 (a) Normalized absorption spectra of DTPA-TPY and DTPA-TPY-Zn in the THF/H₂O mixtures (fᵥ = 65 vol%, containing 1 vol% DMSO). (b) Fluorescence spectra of DTPA-TPY and DTPA-TPY-Zn in the THF/H₂O mixtures (fᵥ = 90 vol%, containing 1 vol% DMSO). Dye concentration: 100 µM. Excitation wavelength: 410 nm.

S4. Fig. S4

Fig. S4 (a) Fluorescence spectra of DTPA-TPY-Zn (100 µM) at the different THF/H₂O mixtures (containing 1 vol% DMSO) in the absence of citrate. (b) Fluorescence spectra of DTPA-TPY-Zn (100 µM) at the different THF/H₂O mixtures (containing 1 vol% DMSO) in the presence of citrate (100 µM). I/I₀ represents the ratio between the fluorescence intensity of detection system with (I) and without (I₀) citrate.
**S5. Fig. S5**

**Fig. S5** Binding constant curve for **DTPA-TPY-Zn** (100 μM) with citrate in the THF/H$_2$O mixtures ($f_w = 65 \text{ vol\%}$, containing 1 vol\% DMSO). [Working formula: $y = \frac{A_0 + A*K*x}{1 + K*x}$.] $x = [\text{analyte}], \ y = \text{absorbance}$. $\lambda_{abs} = 418 \text{ nm}$. 

**S6. Fig. S6**

**Fig. S6** Photographs of **DTPA-TPY-Zn** in the absence and presence of citrate (100 μM) in the THF/H$_2$O mixtures solution ($f_w = 65 \text{ vol\%}$, containing 1 vol\% DMSO, pH = 7) under 365 nm UV irradiation.
Fig. S7 Plotting the fluorescence intensity (value of the emission maxima at 525 nm) as a function of low citrate concentration (4–36 μM) for DTPA-TPY-Zn (100 μM) in the THF/H₂O mixtures (f_w = 65 vol%, containing 1 vol% DMSO).

S8. Characterization Data

¹H NMR of compound 3
$^1$H NMR of compound DTPA-TPY

$^{13}$C NMR of compound DTPA-TPY
High-Res ESI-TOF mass spectrum of DTPA-TPY

Elemental Composition Report

Single Mass Analysis

Tolerance = 50.0 PPM / DBE, min = -1.5, max = 100.0
Element prediction: 0/8
Number of isotope peaks used for i-FIT = 2

Monoisotopic Mass, Even Electron ions

4 formulas evaluated with 1 results within limits (up to 1 closest results for each mass)

Elements ratio:

C: 0.41  H 0.33  N: 0.4  O: 0.2

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1-TOF 6.0.07  4.74=C323

H 7.75.45 (6.477) Cm (6.267)

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1H NMR of compound DTPA-TPY-Zn
$^1$H NMR of compound DTPA-TPY-Zn

MALDI-TOF mass spectrum of DTPA-TPY-Zn