Electronic Supplementary Material (ESI) for Photochemical & Photobiological Science

Supporting Information

Azacrown[N, S, O]-modified Porphyrin Sensor for Detection of Ag^{+}, Pb^{2+} and Cu^{2+}

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Content

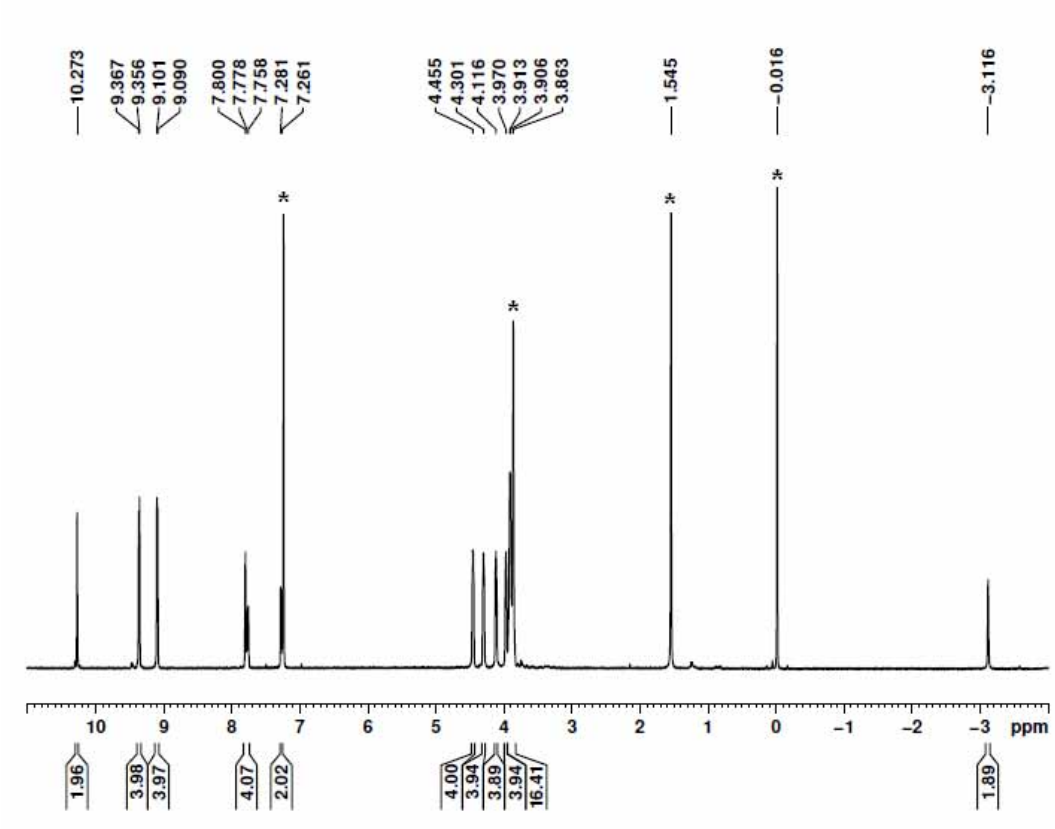

Figure S1. ^{1}H NMR of H_2Por-azacrown (**1**) in $CDCl_3$. * indicates the solvent impurities such as residual solvent signal band, MeOH and H_2O, respectively.

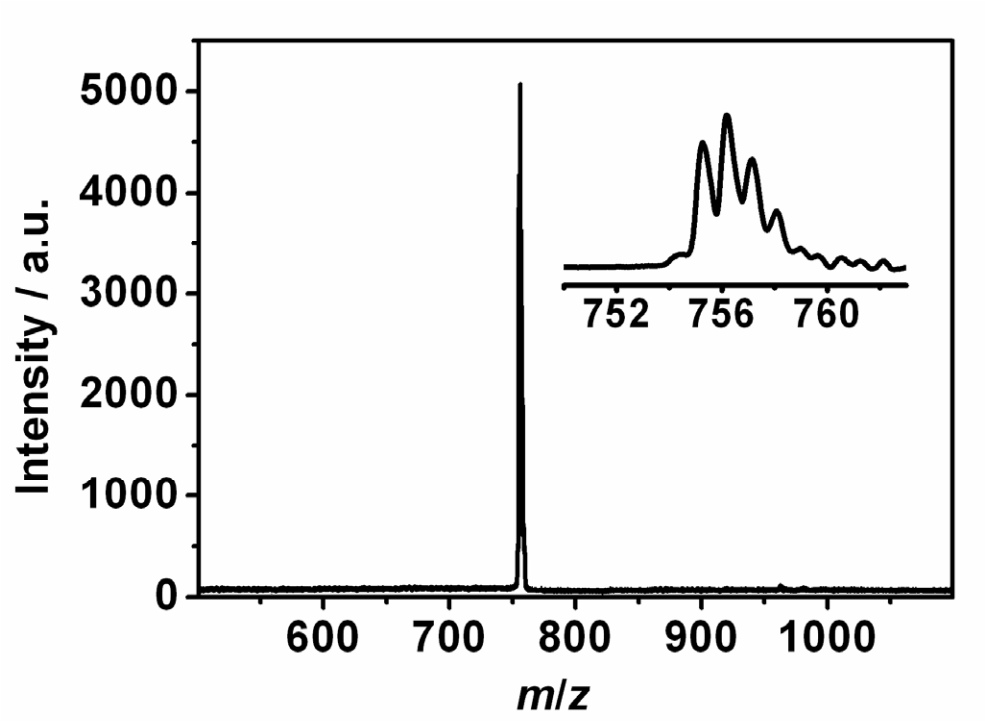

Figure S2. Experimental isotopic pattern for the molecular ion of the compound H_2Por-azacrown (**1**) shown in the MALDI-TOF mass spectrum.

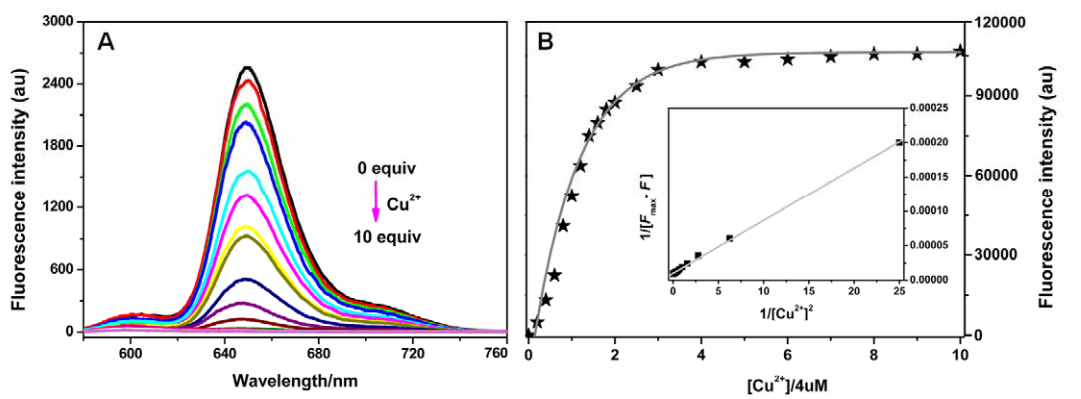

Figure S3 The fluorescent emission spectra of **1** at the concentration of 4 μM in CH_2Cl_2/MeOH (3:2) upon addition of increasing amount (0-10 equiv) of Cu^{2+} (A), and Relative fluorescence intensities (F_{max}-F) of **1** in the range from 580 to 750 nm as a function of the concentration of Cu^{2+} together with the inset showing assuming 1:2 stoichiometry for association between **1** and Cu^{2+} (B), with the excitation of 420 nm.

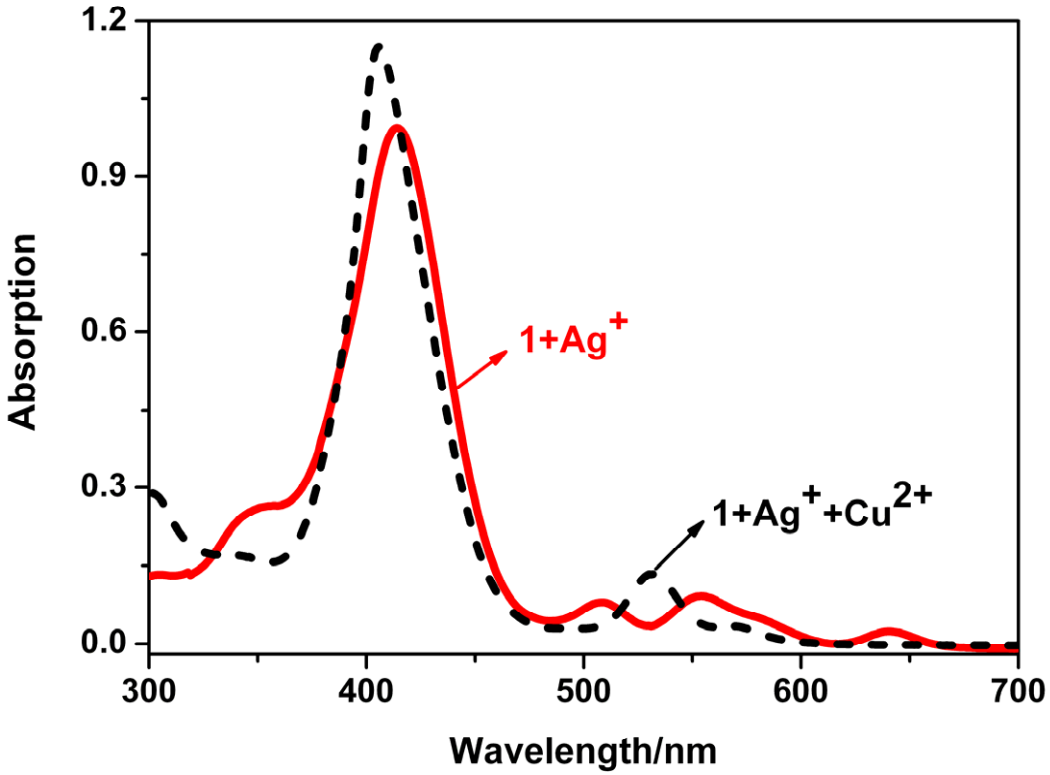

Figure S4. The electronic absorption spectrum of **1-Ag**$^{+}$ (1:10) at the concentration of 4 μM in CH_2Cl_2/MeOH (3:2) upon adding Cu^{2+} (10 equiv).

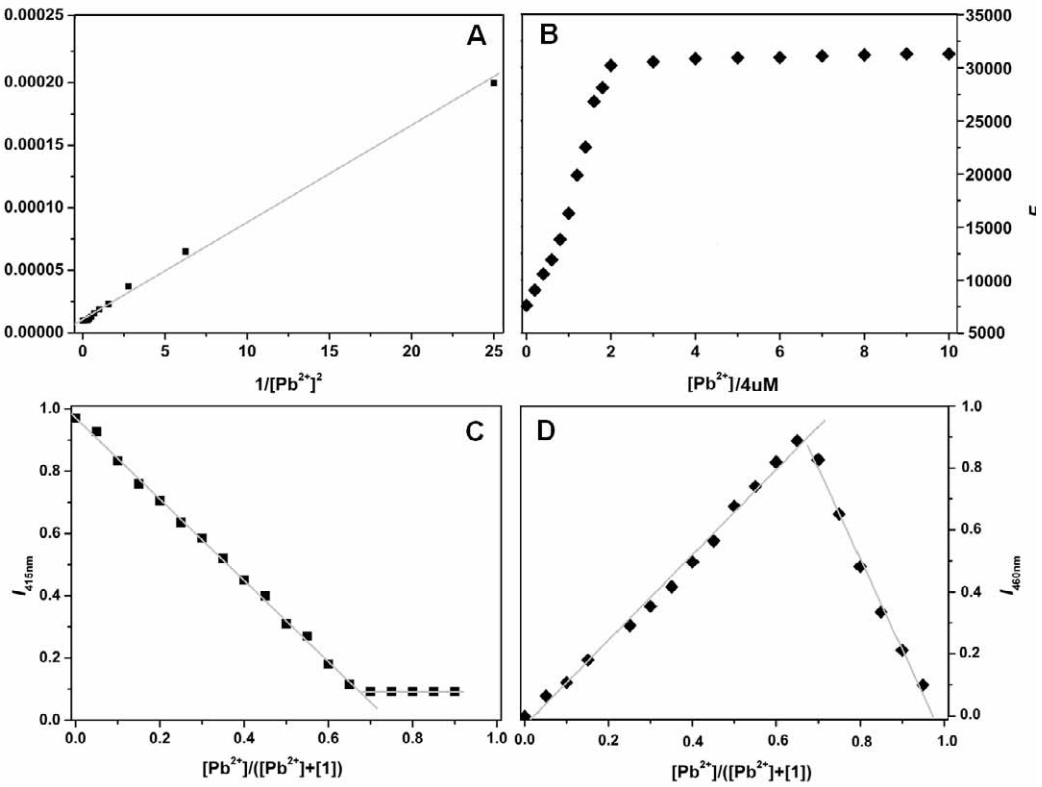

Figure S5. The linear relation between $1/F_{max}$-F and $1/[Pb^{2+}]^2$ according to Benesi-Hildebrand equation with the emission at 650 nm (A) and the change of fluorescence emission at 600 nm along with the increasing amount of Pb^{2+} (0-10 equiv) (B); the absorption Job's plot with the absorption at 415 nm (C) and 460 nm (D), respectively, indicating the 1:2 binding stoichiometry between **1** and Pb^{2+}.

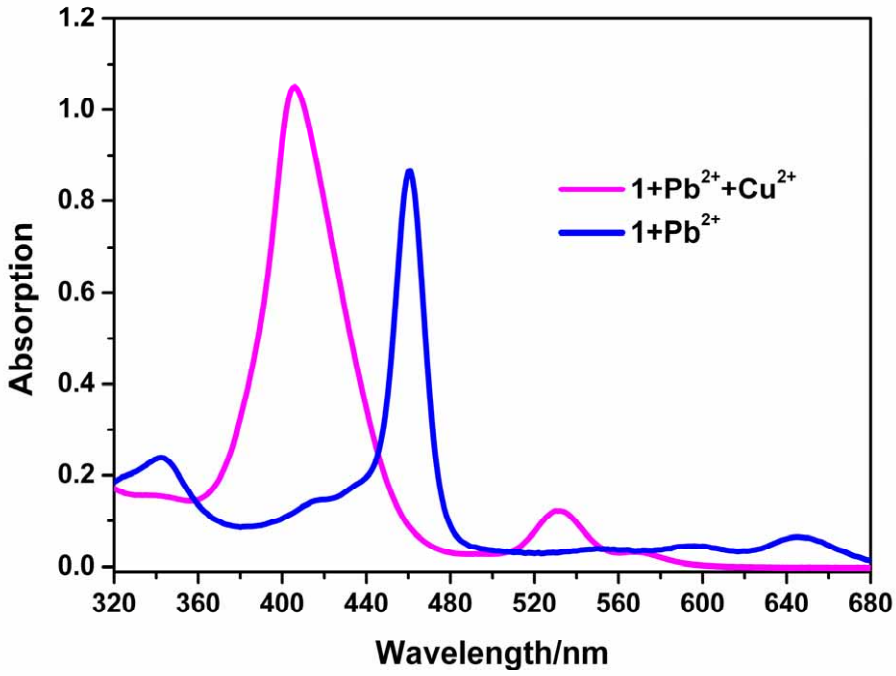

Figure S6. The electronic absorption spectrum of **1**-Pb^{2+} complex upon addition of Cu^{2+} (10 equiv).

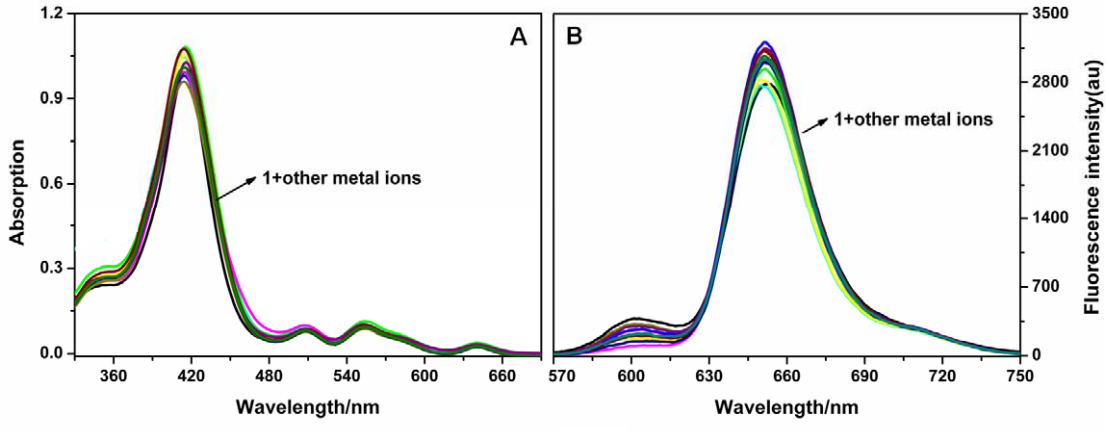

Figure S7. The electronic absorption (A) and fluorescence emission spectra (B) of **1** (4 μM) in CH_2Cl_2/MeOH (3:2) upon addition of Fe^{3+}, Co^{2+}, Hg^{2+}, Mn^{2+}, Zn^{2+}, Ni^{2+}, Cd^{2+}, Ca^{2+}, Ba^{2+}, Mg^{2+}, Li^{+}, Na^{+}, or K^{+} (10 equiv), respectively, with the excitation of 420 nm.

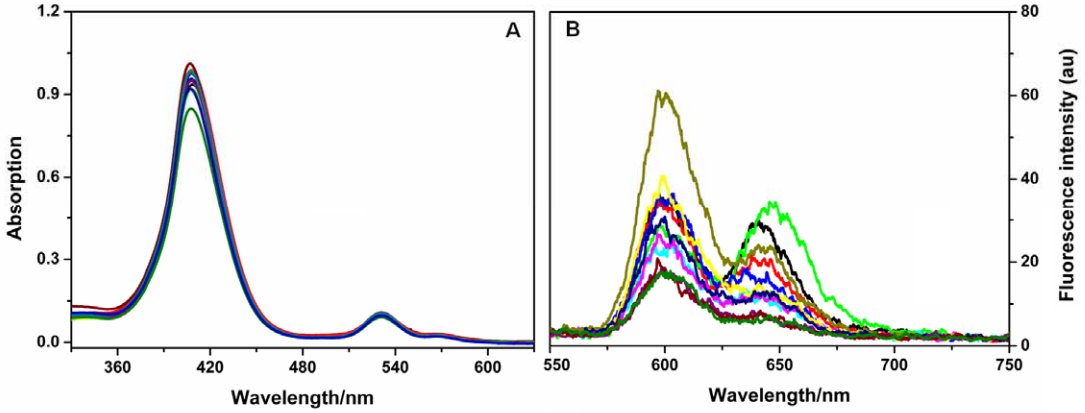

Figure S8. The electronic absorption (A) and fluorescence emission spectra (B) of **1-Cu^{2+}**(1:10) in CH_2Cl_2/MeOH (3:2) upon addition of K^+, Li^+, Cd^{2+}, Ni^{2+}, Mn^{2+}, Ba^{2+}, Fe^{3+}, Co^{2+}, Mg^{2+}, Ca^{2+}, Na^+, Hg^{2+}, or Zn^{2+} (10 equiv), respectively, with the excitation of 420 nm.

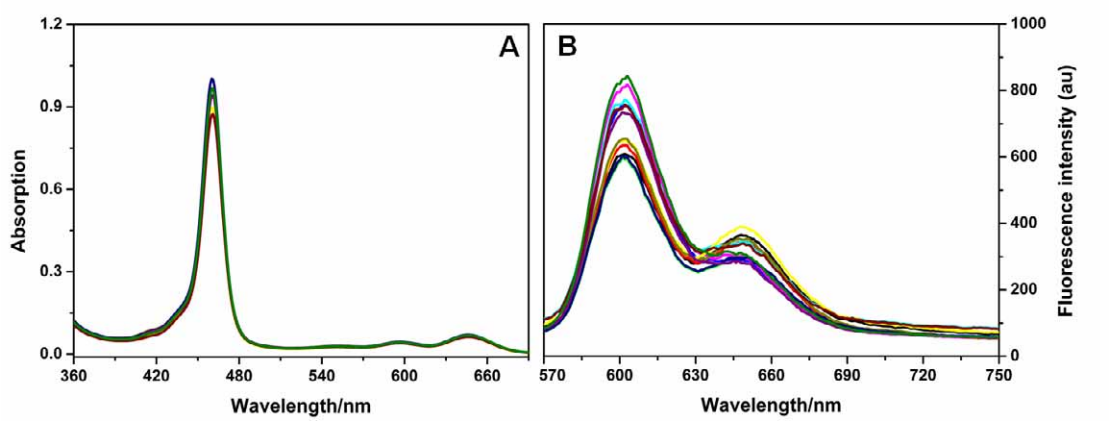

Figure S9. The electronic absorption (A) and fluorescence emission spectra (B) of **1-Pb**$^{2+}$(1:10) in CH_2Cl_2/MeOH (3:2) upon addition of K^+, Li^+, Cd^{2+}, Ni^{2+}, Mn^{2+}, Ba^{2+}, Fe^{3+}, Co^{2+}, Mg^{2+}, Ca^{2+}, Na^+, Hg^{2+}, or Zn^{2+} (10 equiv), respectively, with the excitation of 420 nm.

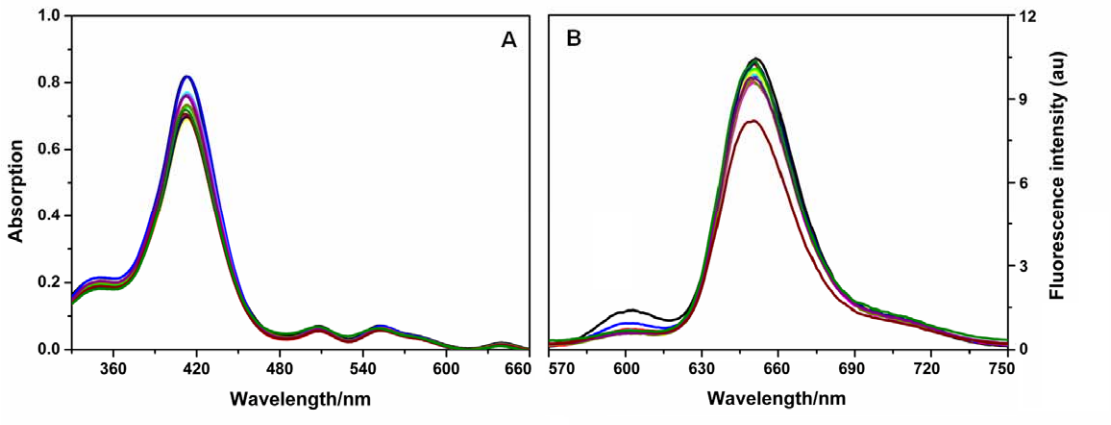

Figure S10. The electronic absorption (A) and fluorescence emission spectra (B) of **1-Ag**$^{+}$(1:10) in CH_2Cl_2/MeOH (3:2) upon addition of K^{+}, Li^{+}, Cd^{2+}, Ni^{2+}, Mn^{2+}, Ba^{2+}, Fe^{3+}, Co^{2+}, Mg^{2+}, Ca^{2+}, Na^{+}, Hg^{2+}, or Zn^{2+} (10 equiv), respectively, with the excitation of 420 nm.

Table S1. ^{1}H NMR data (δ) for H_2Por-azacrown (**1**) in $CDCl_3$.

Por-meso-H	pyrrole-H	Por-Ph-H	Aza-crown-H	**CH_3**	metal-free H
10.27 (s, 2 H)	9.37 (d, 4 H) 9.10 (d, 4 H)	7.80 (t, 4 H) 7.28 (t, 4 H)[a]	4.46 (s, 4 H) 4.30 (s, 4 H) 4.12 (s, 4 H), 3.97 (s, 4 H), 3.92~3.86(m, 4H) [b]	3.92-3.86 (m, 6 H)[b]	-3.12 (s, 2 H)

[a] Two proton signals are overlapped by the bands of the residual solvent $CHCl_3$, MeOH; [b] These signals are overlapped by the bands of MeOH.