Supplementary Material (ESI) for Chemical Communications

Highly sensitive naked-eye and fluorescence "turn-on" detection of Cu^{2+} using Fenton reaction assisted signal amplification

Yi-Bin Ruan,[a] Chun Li,[a,b] Jie Tang[b] and Juan Xie[a]*

[a] *PPSM, Institut d'Alembert, ENS Cachan, CNRS, Universud, 61 av President Wilson, F-94230 Cachan, France*

[b]*Institute of Medicinal Chemistry, Department of Chemistry, East China Normal University, Shanghai 200062, China*

Email: joanne.xie@ppsm.ens-cachan.fr

Electronic Supporting Information

1. Materials and Methods

Absorption spectra were recorded on a Uvikon-940 KON-TRON spectrophotometers and corrected emission spectra were performed on a Jobin-Yvon Spex Fluorolog 1681 spectrofluorometer (1 cm quartz cell was used). Stock solution (1.0 mM) of compounds **1** and **2** was prepared in DMSO. Stock solutions of metal nitrate/perchlorate salts were prepared in H_2O/MeCN, respectively.

The tested metal salts included $Cu(NO_3)_2$, CuI, $AgNO_3$, $Ca(ClO_4)_2$, $Ba(ClO_4)_2$, $Mn(ClO_4)_2$, $Mg(ClO_4)_2$, $Co(ClO_4)_2$, $Cd(ClO_4)_2$, $Zn(ClO_4)_2$, $Ni(ClO_4)_2$, $Fe(ClO_4)_2$, $Pb(ClO_4)_2$, and $Hg(ClO_4)_2$.

2. Procedure of detection of Cu^{2+}

To the Mill-Q water solution containing 10 μM of compound **1**, 1.0 mM NaAscH was first introduced, and then varying concentration of Cu^{2+} was subsequently added to the above solution. The solution was incubated for 7 min and then spectra were recorded.

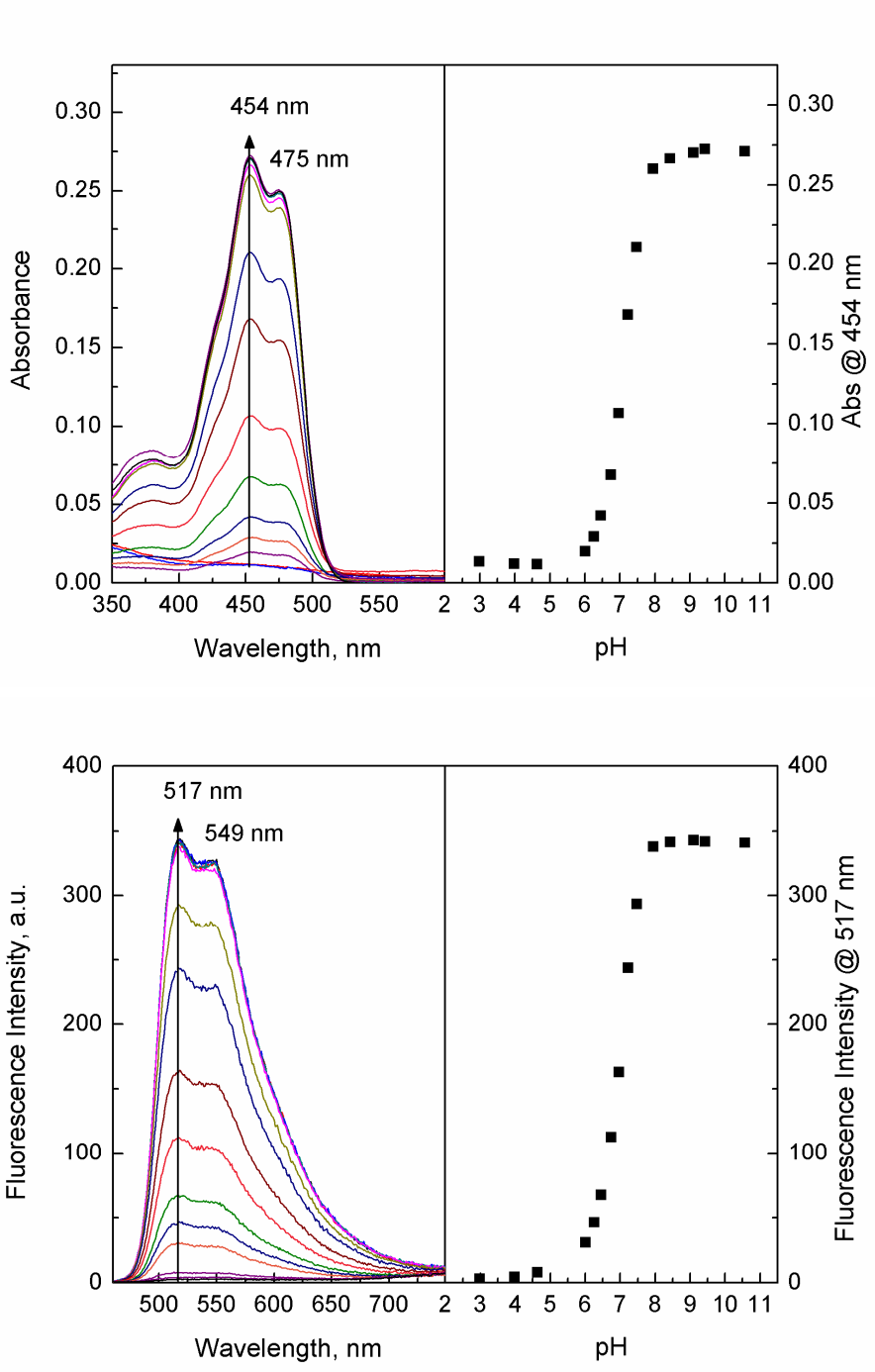


Fig. S1 Absorption (top) and fluorescence (bottom) spectra of compound **1** in 10 mM HEPES solution under different pH conditions. [**1**] = 10.0 μM, λ_{ex} = 454 nm.

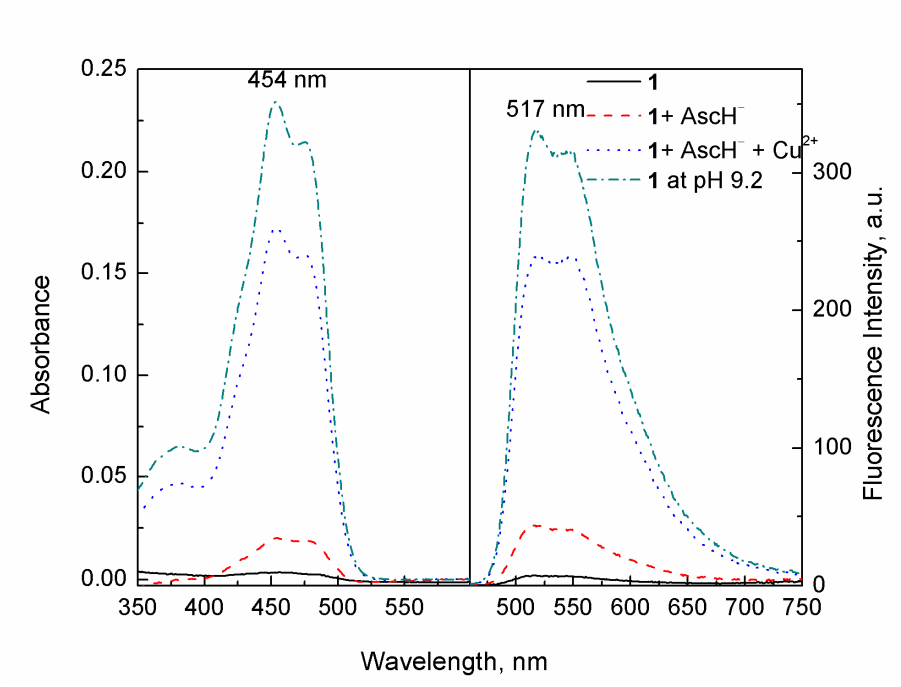


Fig. S2 Absorption (left) and fluorescence (right) spectra of **1**, **1** in the absence and presence of Cu^{2+} in H_2O or **1** at pH 9.2. [**1**] = 10.0 μM, [Cu^{2+}] = 0.5 μM, [$AscH^-$] = 1.0 mM, λ_{ex} = 454 nm, reaction time 7 min.

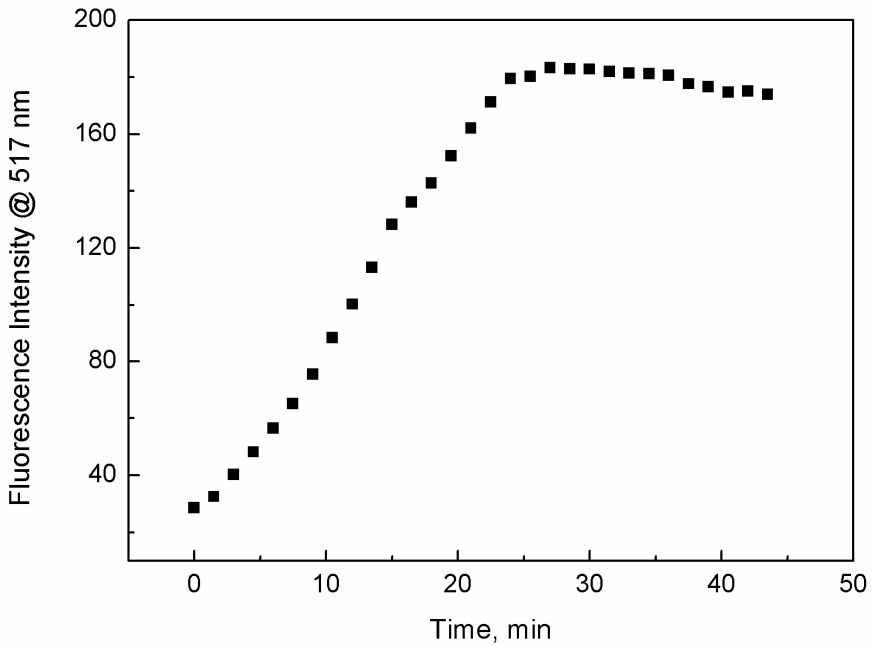


Fig. S3 Kinetics profiles of **1** in the presence of 200 nM Cu^{2+} in H_2O. [**1**] = 10.0 μM, [$AscH^-$] = 1.0 mM, λ_{ex} = 454 nm.

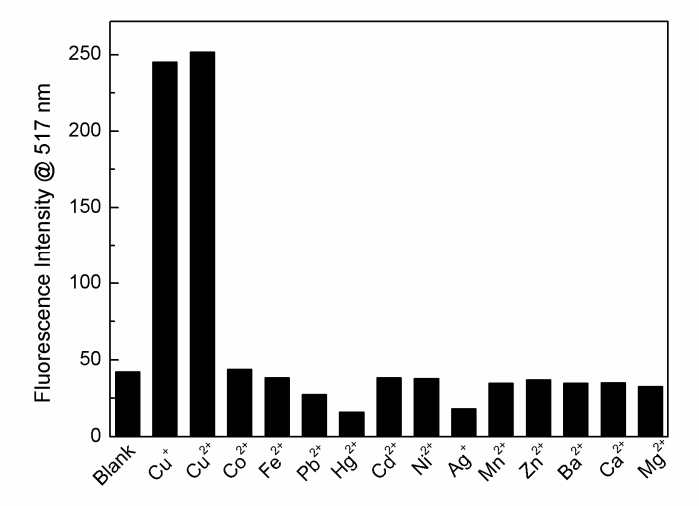
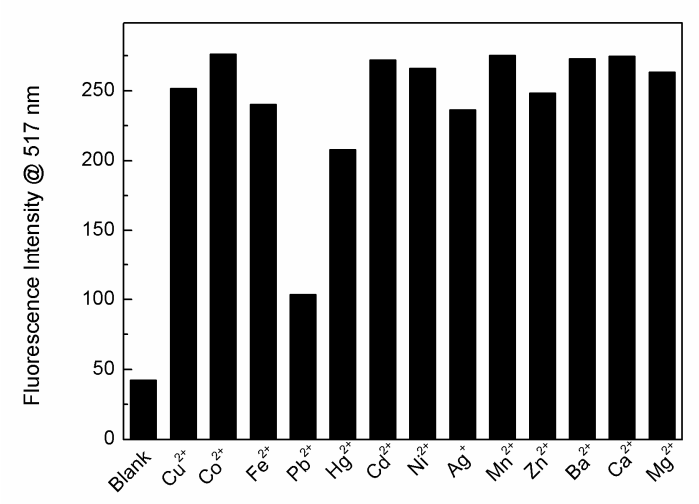


Fig. S4 Fluorescence intensity at 517 nm of **1** in the presence of various metal ions in H_2O. [**1**] = 10.0 μM, [Cu^{+}] = [Cu^{2+}] = 0.5 μM and other metal ions 40 μM, [$AscH^{-}$] = 1.0 mM, reaction time 7 min.



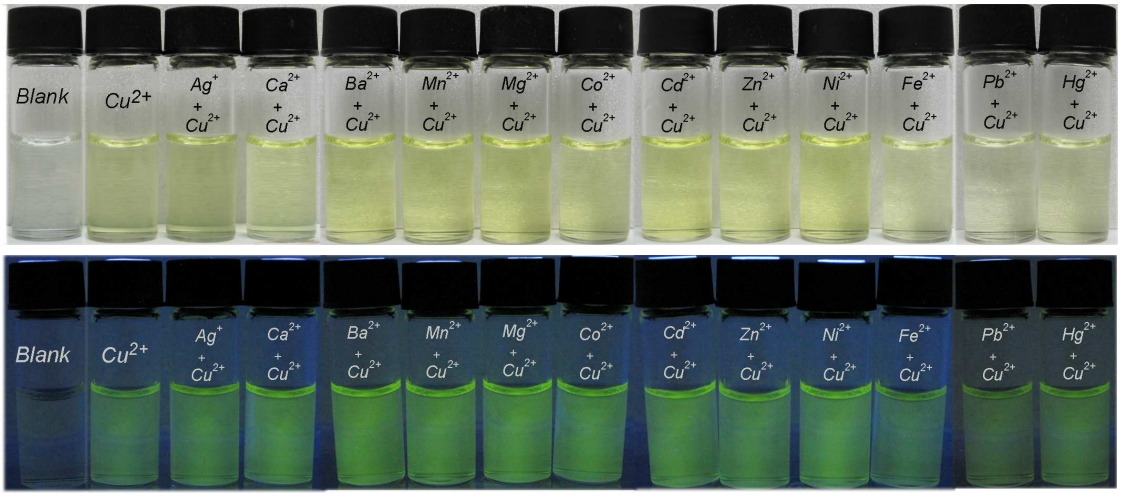


Fig. S5 Fluorescence intensity at 517 nm (top), color (middle) and fluorescence (bottom) change of **1** in the presence of various metal ions and then further addition of Cu^{2+} in H_2O. [**1**] = 10.0 μM, [Cu^{2+}] = 5.0 μM and other metal ions 40 μM, [$AscH^{-}$] = 1.0 mM, illuminated under 365 nm, reaction time 5 min.

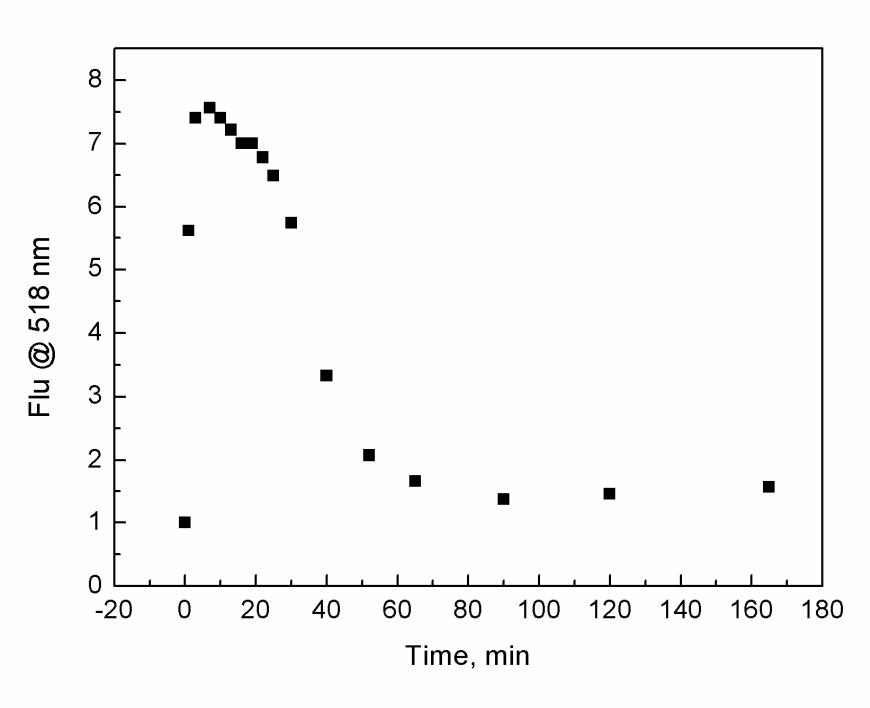


Fig. S6 Kinetics profiles of **1** in the presence of Cu^{2+} in H_2O. [**1**] = 10.0 μM, [Cu^{2+}] = 0.5 μM, [$AscH^-$] = 1.0 mM, λ_{ex} = 454 nm.

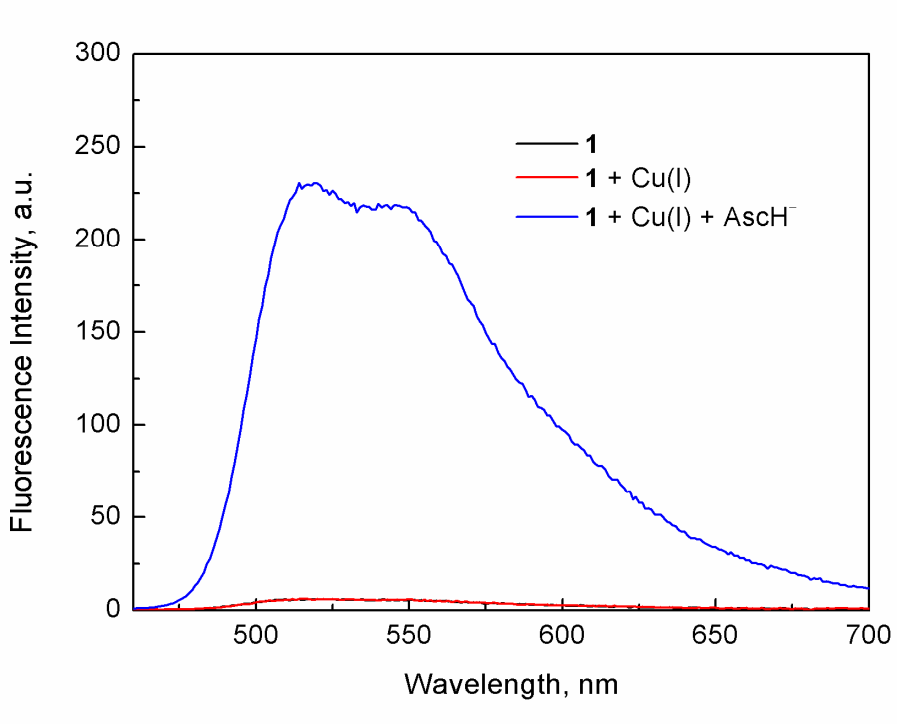


Fig. S7 Fluorescence spectra of **1**, **1** + Cu^+ in the absence and presence of $AscH^-$ in H_2O. [**1**] = 10.0 μM, [Cu^+] = 0.5 μM, [$AscH^-$] = 1.0 mM, λ_{ex} = 454 nm.

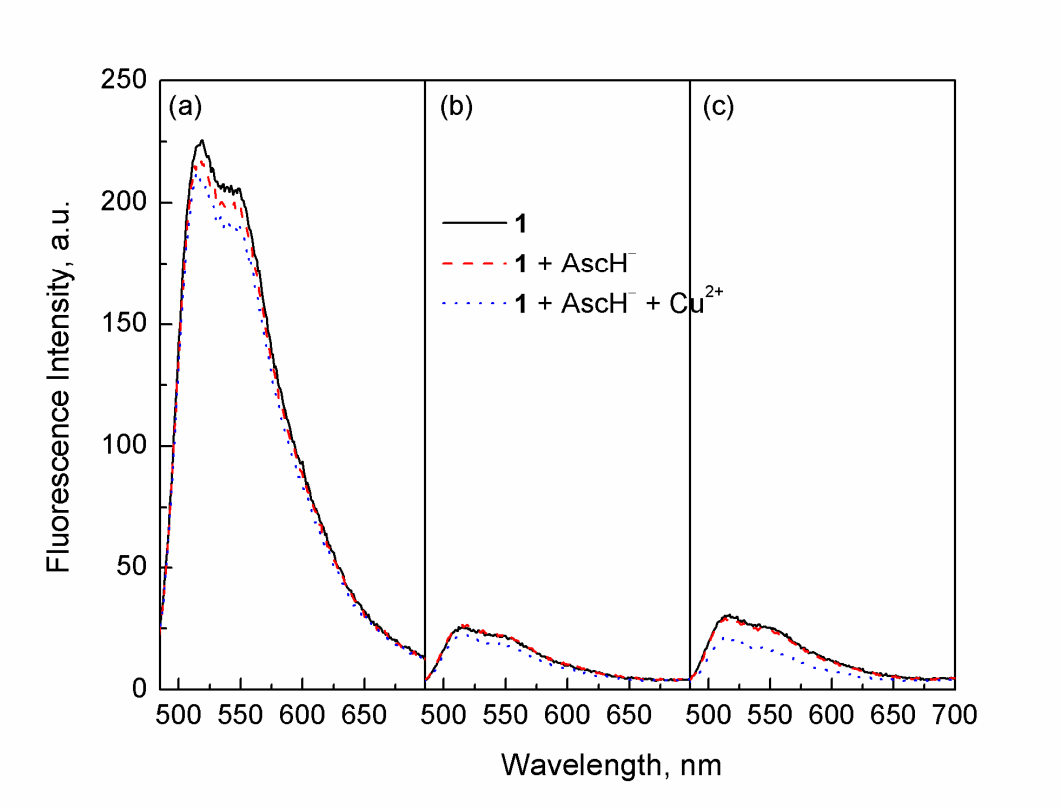


Fig. S8 Fluorescence spectra of **1** in the absence and presence of Cu^{2+} in buffered solution. (a) 10 mM HEPES at pH 7.2; (b) 10 mM HEPES at pH 6.0; (c) 10 mM $NaHPO_4$-NaH_2PO_4 at pH 6.0. [**1**] = 10.0 μM, [Cu^{2+}] = 0.5 μM, [$AscH^-$] = 1.0 mM, λ_{ex} = 480 nm, reaction time 8 min.

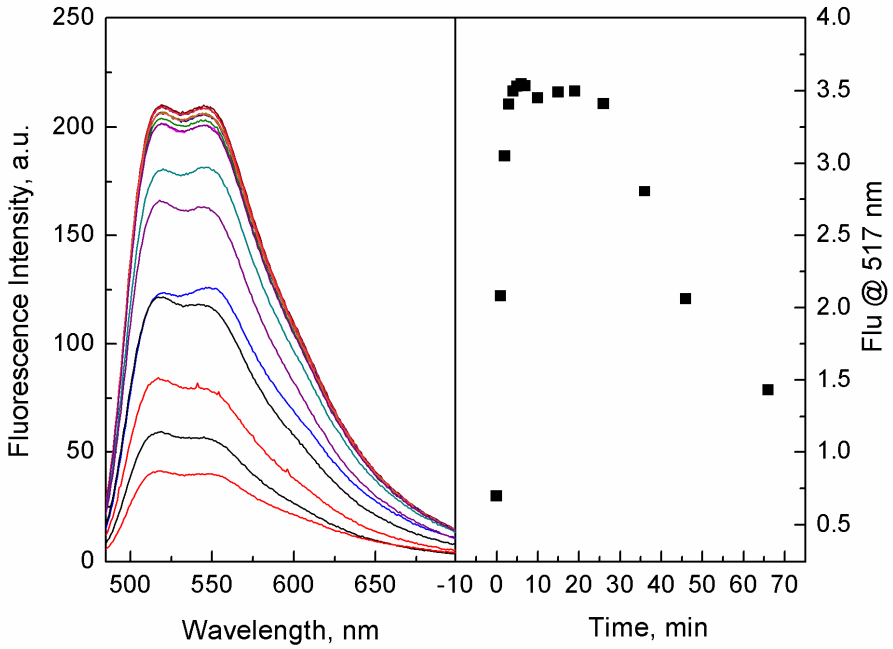


Fig. S9 Kinetics profiles of **2** in the presence of Cu^{2+} in H_2O. [**2**] = 10.0 μM, [Cu^{2+}] = 0.5 μM, [$AscH^-$] = 1.0 mM, λ_{ex} = 454 nm.