Electronic Supplementary Material (ESI) for Analyst.

Supporting Information

Multifunctional Dendritic Molecular Probe for Selective Detection of Cu^{2+} Ions Using Potentiometric and Fluorometric Techniques

Partha Sarathi Sheet, Suji Park, Pavel Sengupta and Dipankar Koley*

*Department of Chemistry, Oregon State University, Corvallis, OR 97331, USA.

*Corresponding author: Dipankar.Koley@oregonstate.edu

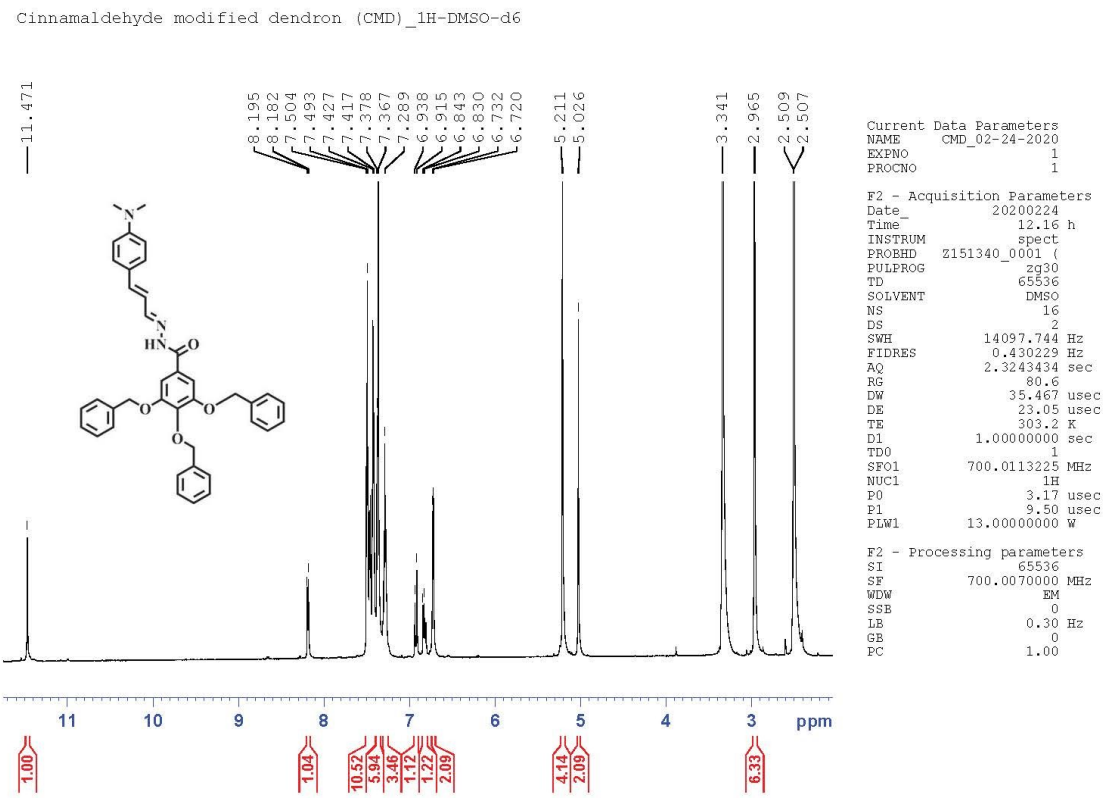

Figure S1. ^{1}H NMR of Cinnamaldehyde modified dendron (CMD).

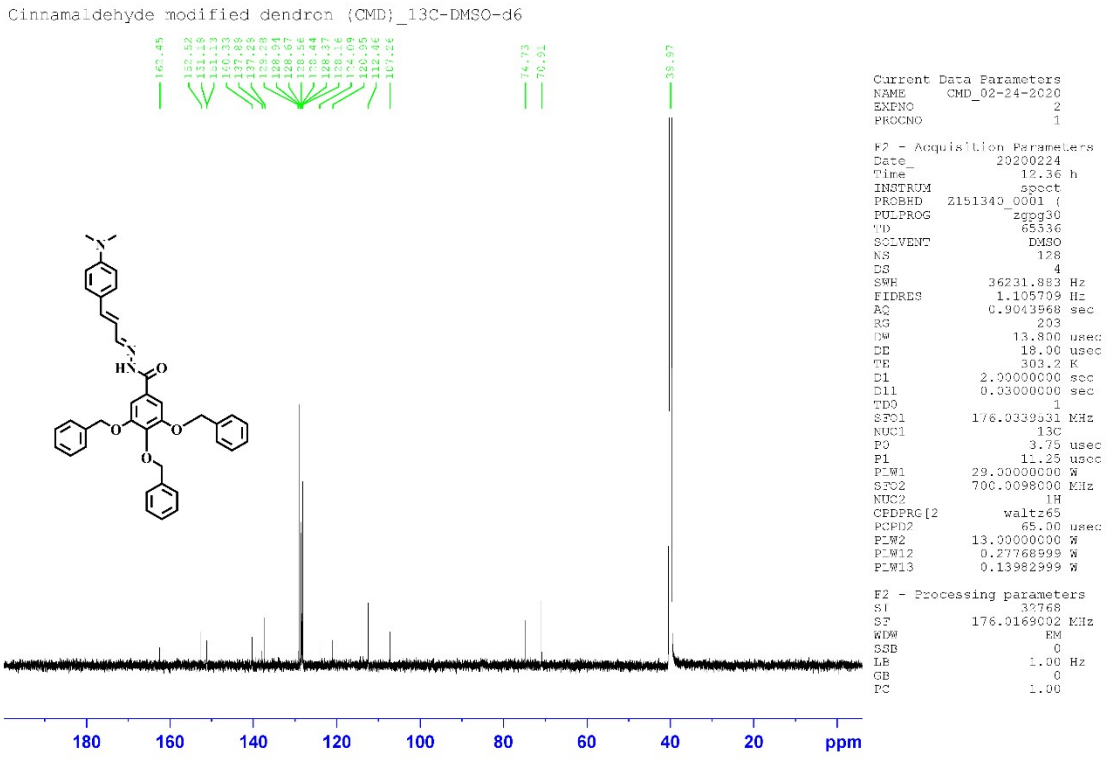

Figure S2. ^{13}C NMR of Cinnamaldehyde modified dendron (CMD).

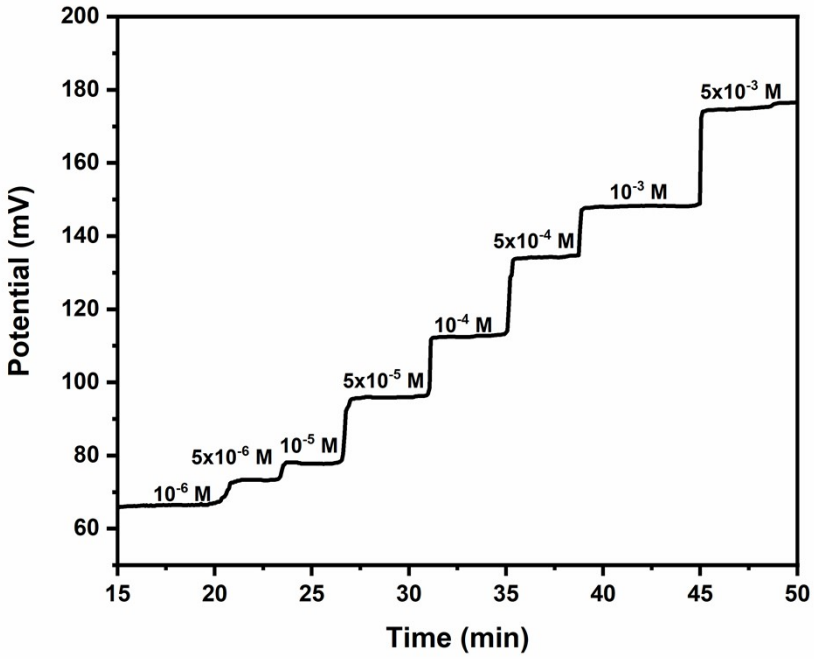

Figure S3. The potential response of the Cu^{2+} microsensor upon the addition of Cu^{2+} ions.

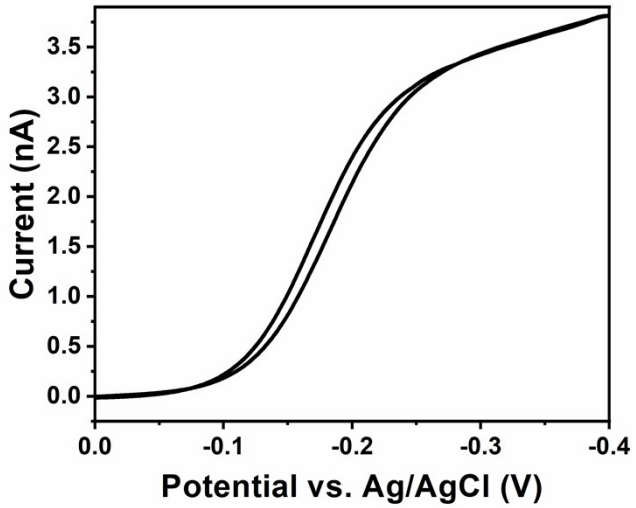

Figure S4. Cyclic voltammetry of Cu^{2+} micro-ISE in 1 mM RuHex in 0.1 M KCl (vs Ag/AgCl).

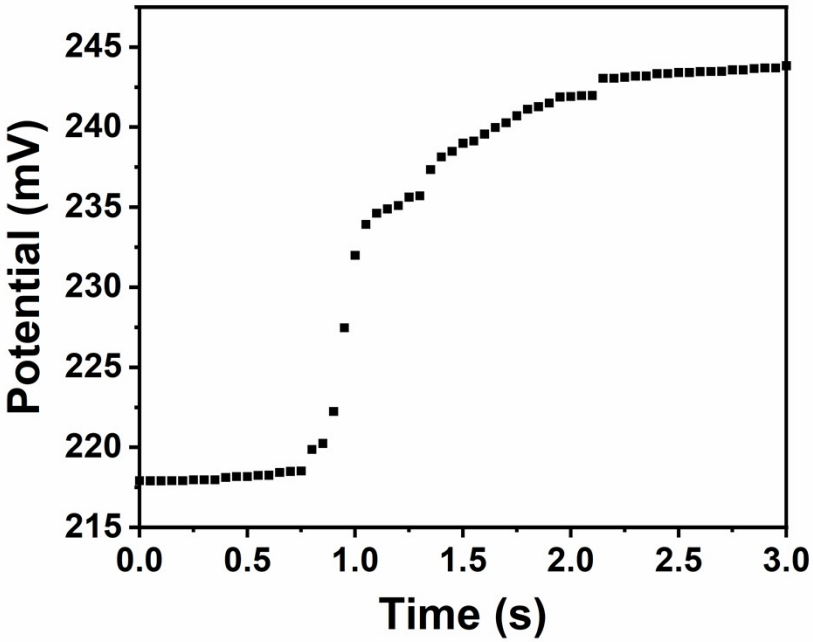

Figure S5. The response time of the Cu^{2+} microsensor. Potential was recorded when the concentration changes from 10^{-5} M to 10^{-4} M Cu^{2+}.

Parameters	CMD	Cu (II) ionophore I
Detection limit (μM)	3.5	0.14
Slope (mV/decade)	29.3	29
Response time (s)	1.5	9
pH range	3.5-6.0	3.2-5.5

Table S1. Comparison table for the sensing performance between the ISEs made with CMD as ionophore vs ISEs containing the commercially available Cu (II) ionophore I.

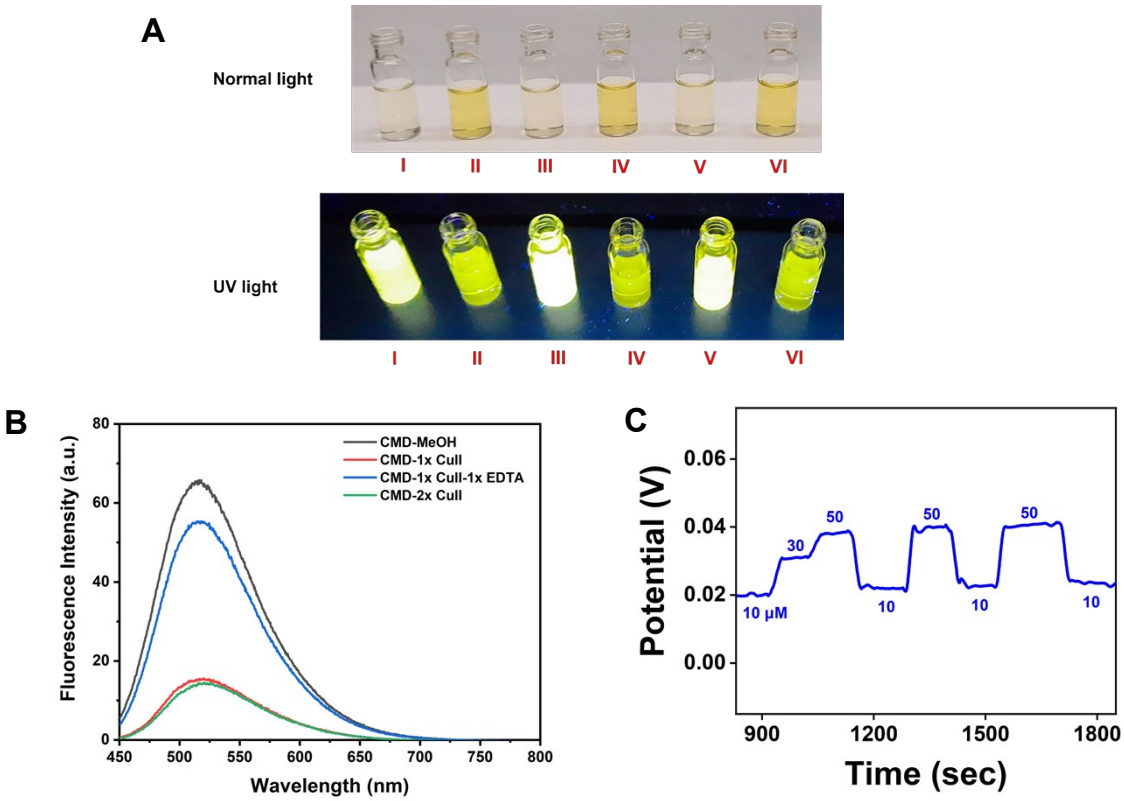

Figure S6. (A) Visual detection of CMD reversibility under normal and UV light (excitation at 365 nm) (in order: I = 20 μM CMD; II = I + 5 μM Cu^{2+}; III = II + 5 μM EDTA; IV = III + 5 μM Cu^{2+}; V = IV + 5 μM EDTA; VI = V + 5 μM Cu^{2+}) (B) Fluorescence spectra of CMD reversibility performed with alternate additions of 5 μM Cu^{2+} and 5 μM EDTA in 20 μM CMD (C) Reversibility of Cu^{2+}-ISE. The potential was recorded while the Cu^{2+} concentration was repeatedly changed from 10 μM to 50 μM and vice versa.

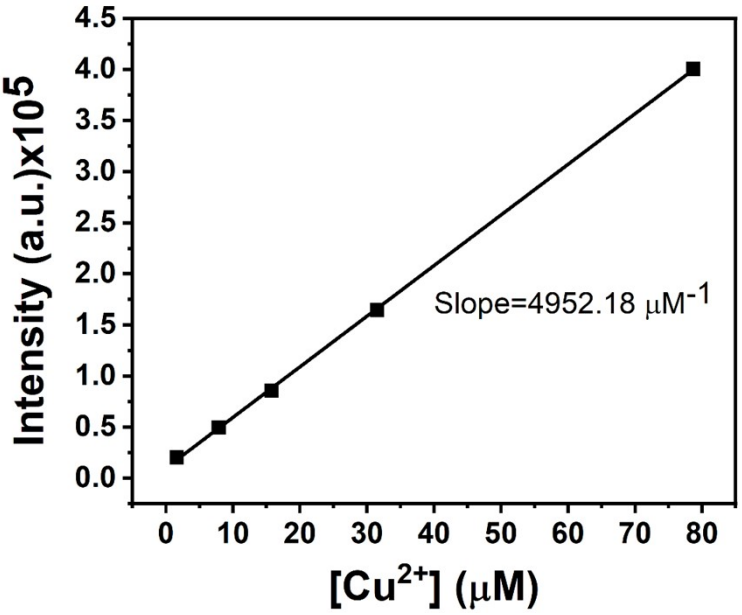

Figure S7. Calibration plot for the inductively coupled plasma- optical emission spectrometry (ICP-OES).