

Electronic Supplementary Information (ESI) for the Manuscript ID [NJ-ART-02-2016-000410.R1](#)

A Co(II) complex of a vitamer of vitamin B₆ acts as sensor of Hg²⁺ and pH in aqueous media

Nilam Sing^a, Sanjay Roy^b, Partha Sarathi Guin^b, Kalachand Mahali^{*c}, Prakash Majee^d, Sudip Kumar Mondal^{*d}, Partha Mahata^e, Partha Sarathi Sengupta^a, Palash Mondal^{*a}

^aDepartment of Chemistry(UG & PG), Vivekananda Mahavidyalaya, Burdwan-713103, India

^bDepartment of Chemistry , Shibpur Dinobundhoo Institution (College), 412/1 G. T. Road (South), Howrah-711102, India

^cDepartment of Chemistry , University of Kalyani, Kalyani-741235, India

^dDepartment of Chemistry, Visva-Bharati, Santiniketan-731235, India

^dDepartment of Chemistry, Suri Vidyasagar College, Suri -731101, India

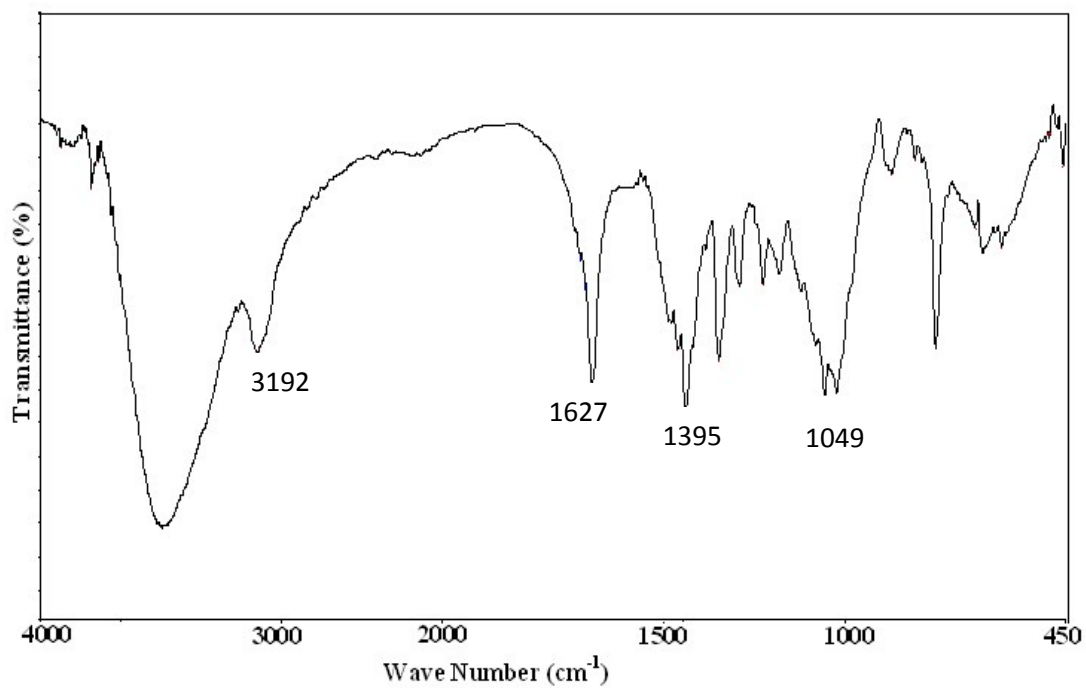


Figure S1: FTIR Spectra of complex 1

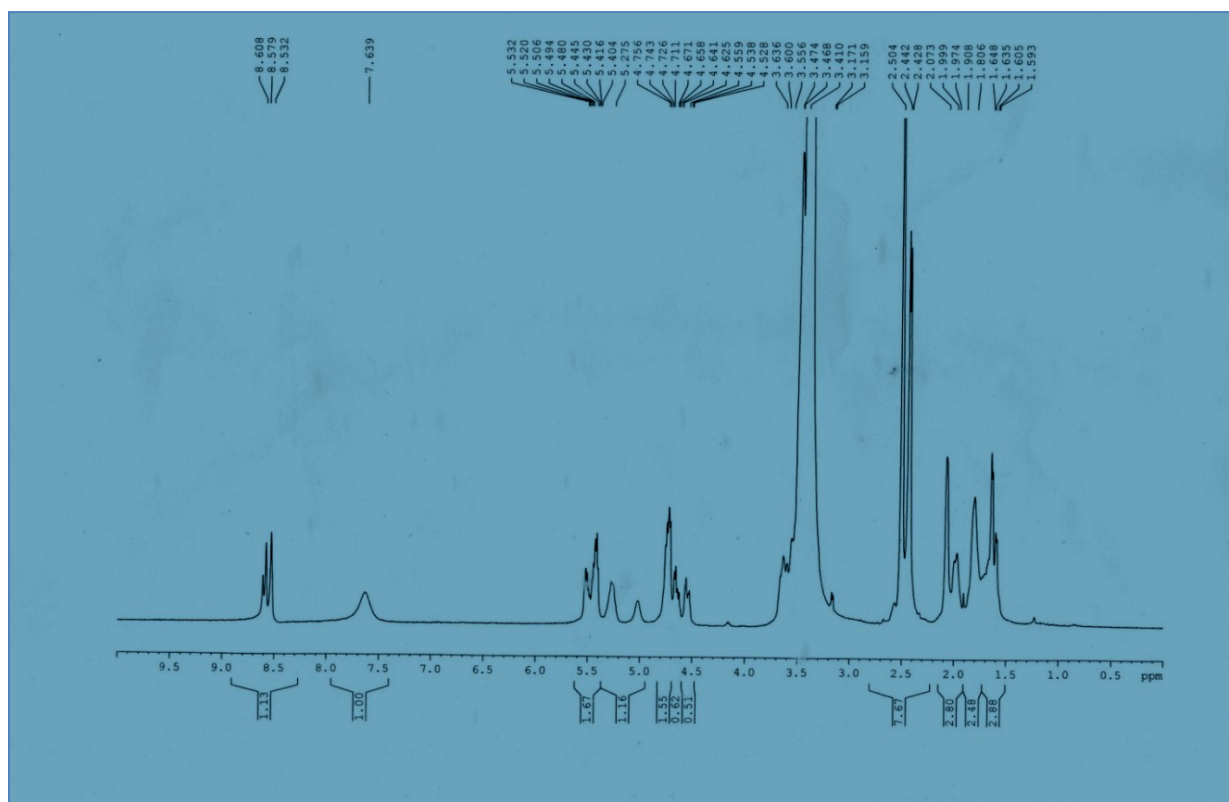


Figure S2: ¹H NMR of complex 1

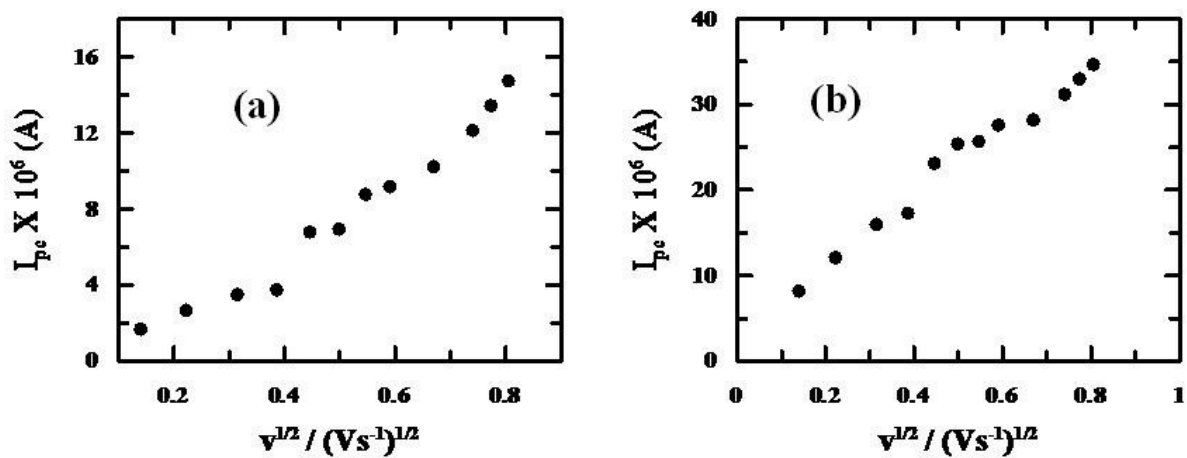


Figure S3: Plot of Cathodic peak currents [I_{p1} (a) and I_{p2} (b)] for the first and second reduction of complex 1 in dimethyl sulphoxide media.

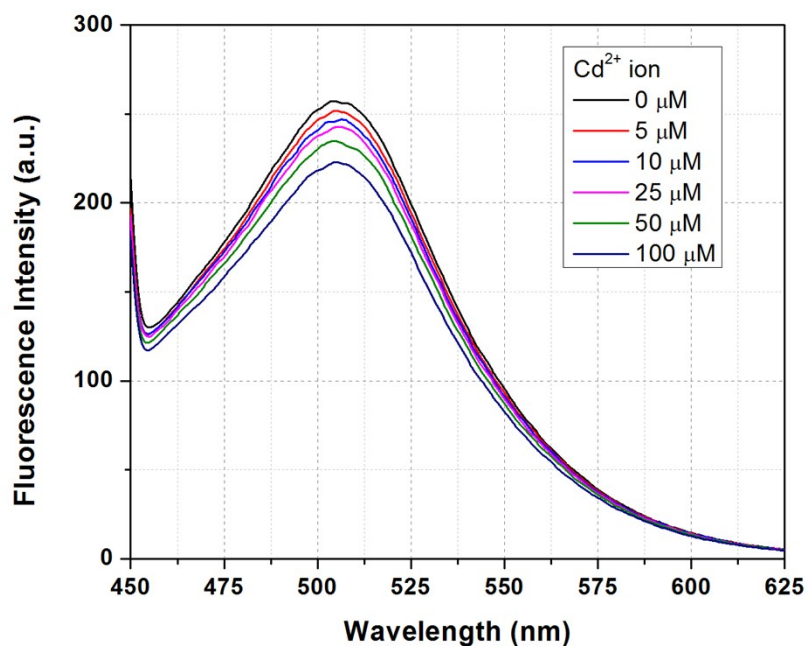


Figure S4: Emission spectra of complex 1 in aqueous solution upon addition of increasing amount of Cd^{2+} ($\lambda_{ex} = 425$ nm). Concentration of Cd^{2+} in the medium is indicated in the legend.

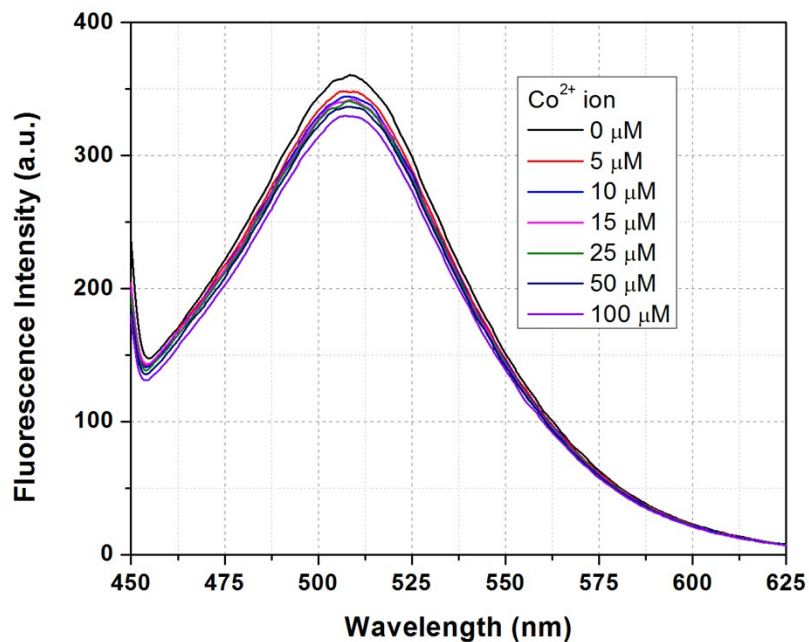


Figure S5: Emission spectra of complex 1 in aqueous solution upon addition of increasing amount of Co^{2+} ($\lambda_{\text{ex}} = 425 \text{ nm}$). Concentration of Co^{2+} in the medium is indicated in the legend.

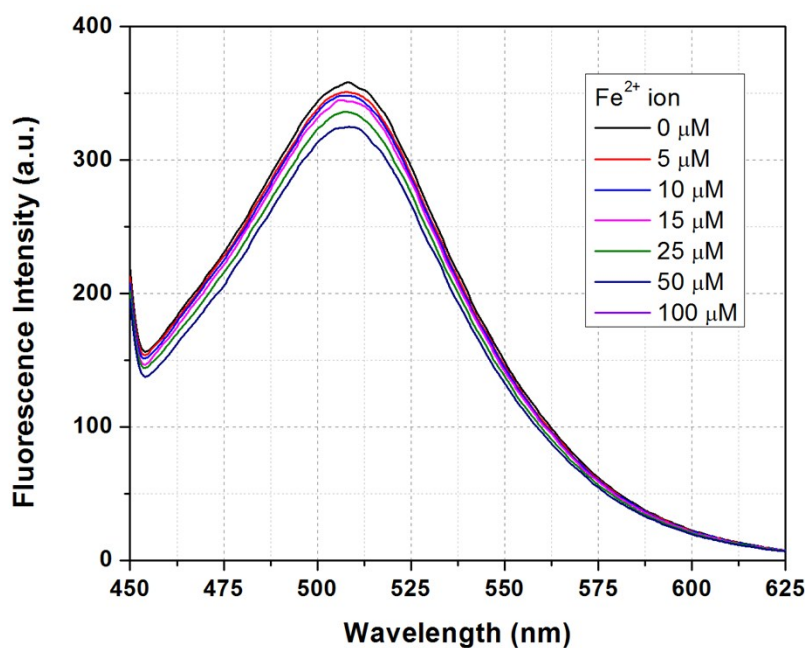


Figure S6: Emission spectra of complex 1 in aqueous solution upon addition of increasing amount of Fe^{2+} ($\lambda_{\text{ex}} = 425 \text{ nm}$). Concentration of Fe^{2+} in the medium is indicated in the legend.

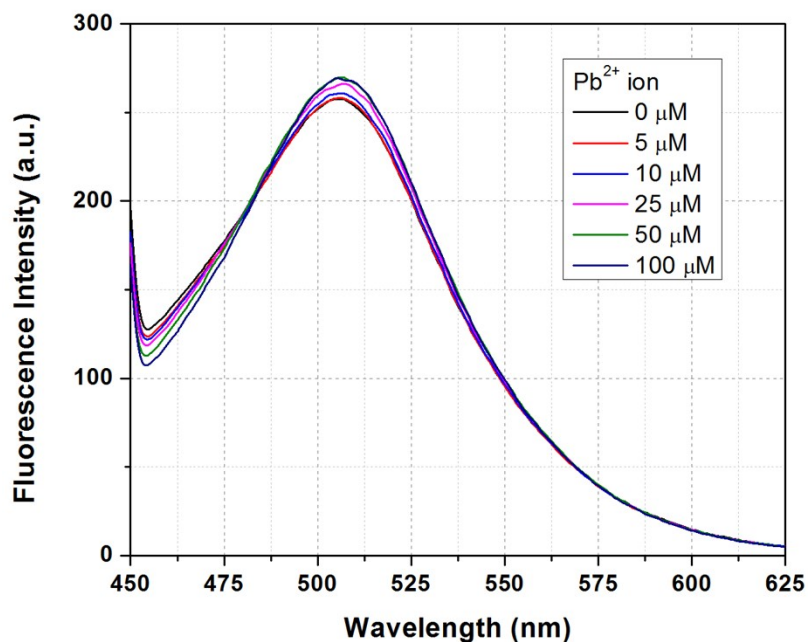


Figure S7: Emission spectra of complex 1 in aqueous solution upon addition of increasing amount of Pb^{2+} ($\lambda_{\text{ex}} = 425 \text{ nm}$). Concentration of Pb^{2+} in the medium is indicated in the legend.

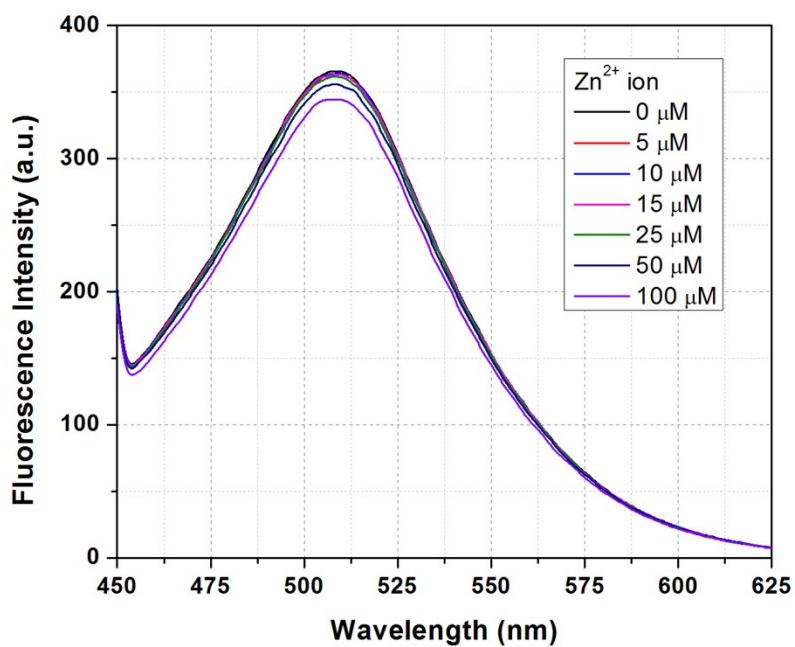


Figure S8: Emission spectra of complex 1 in aqueous solution upon addition of increasing amount of Zn^{2+} ($\lambda_{\text{ex}} = 425 \text{ nm}$). Concentration of Zn^{2+} in the medium is indicated in the legend.

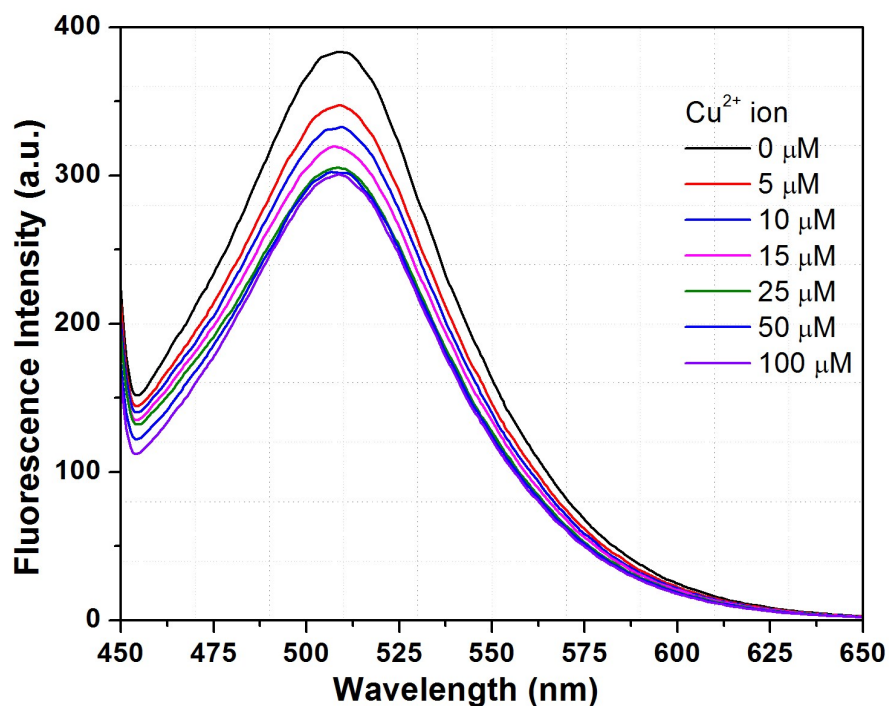


Figure S9: Emission spectra of complex 1 in aqueous solution upon incremental addition of Zn^{2+} ions ($\lambda_{\text{ex}}=425$ nm). Concentration of Cu^{2+} ions in the medium is indicated in the legend.

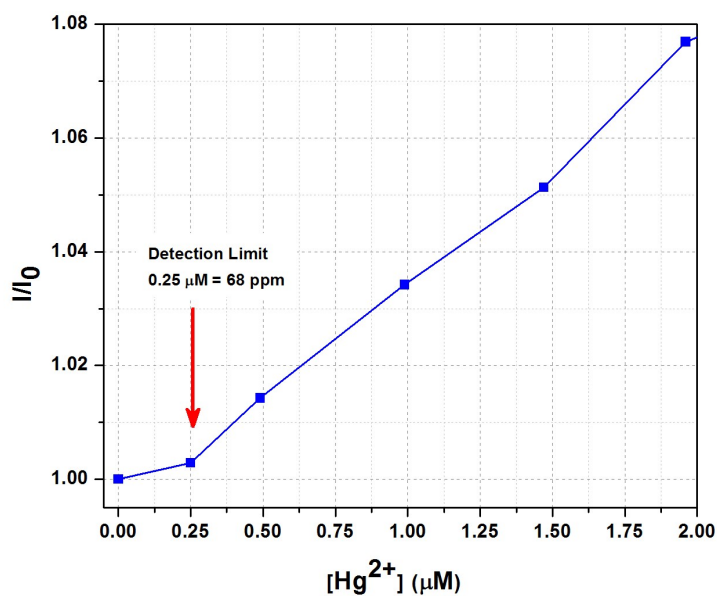
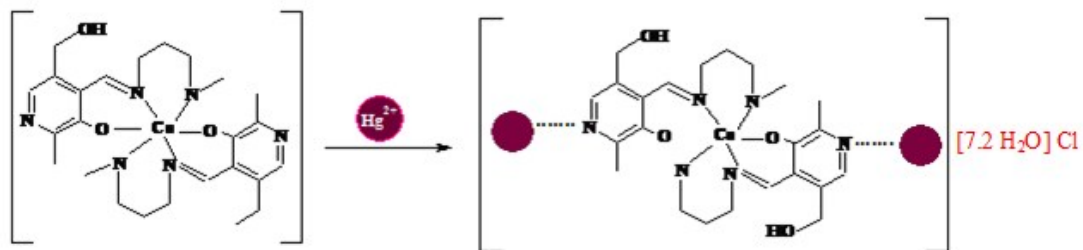


Figure S10: Fluorescence enhancement (at $\lambda_{\text{em}}=506$ nm) versus concentration of Hg^{2+} ions indicating the detection limit. I_0 and I are the fluorescence intensity of complex 1 in absence and presence of Hg^{2+} ions, respectively.



Scheme S1: Probable non covalent type interaction between complex 1 and Hg^{2+} ions.

Scan Rate (mV s^{-1})	E_{p1} (mV)	E_{p2} (mV)
20	-590	-1540
100	-635	-1560
150	-685	-1570
250	-700	-1580
350	-705	-1610
450	-720	-1615
650	-730	-1625

Table S1: Variation of reduction potentials with scan rate for the reduction of the complex 1 in dimethyl sulphoxide media.