

A coronene diimide based radical anion for detection of picomolar H₂O₂: a biochemical assay for detection of picomolar glucose in aqueous medium

Navdeep Kaur^a and Prabhpreet Singh^{*a}

Department of Chemistry, UGC Centre for Advanced Studies-II, Guru Nanak Dev University, Amritsar 143001 (pb.)-India

E-mail: prabhpreet.chem@gndu.ac.in; M: +91 8427101534

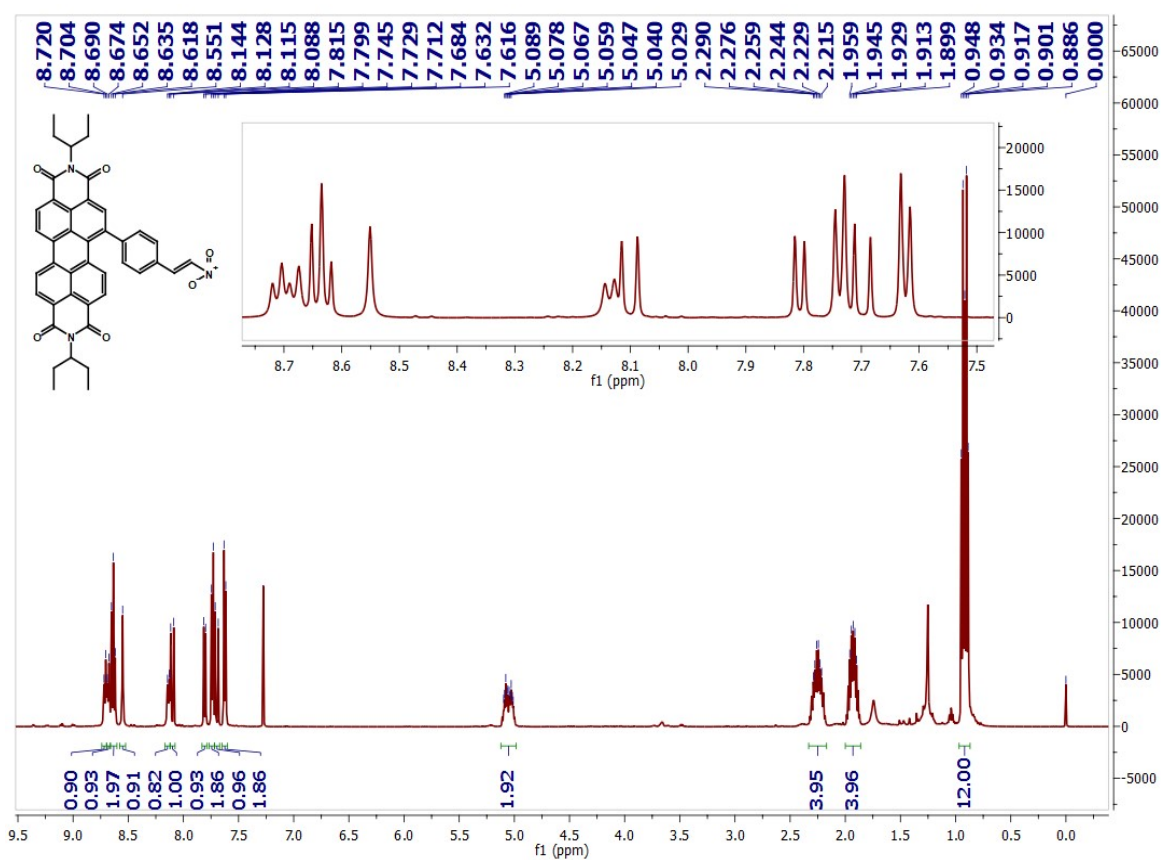


Figure S1. The Proton (¹H) NMR spectrum for PDI 1.

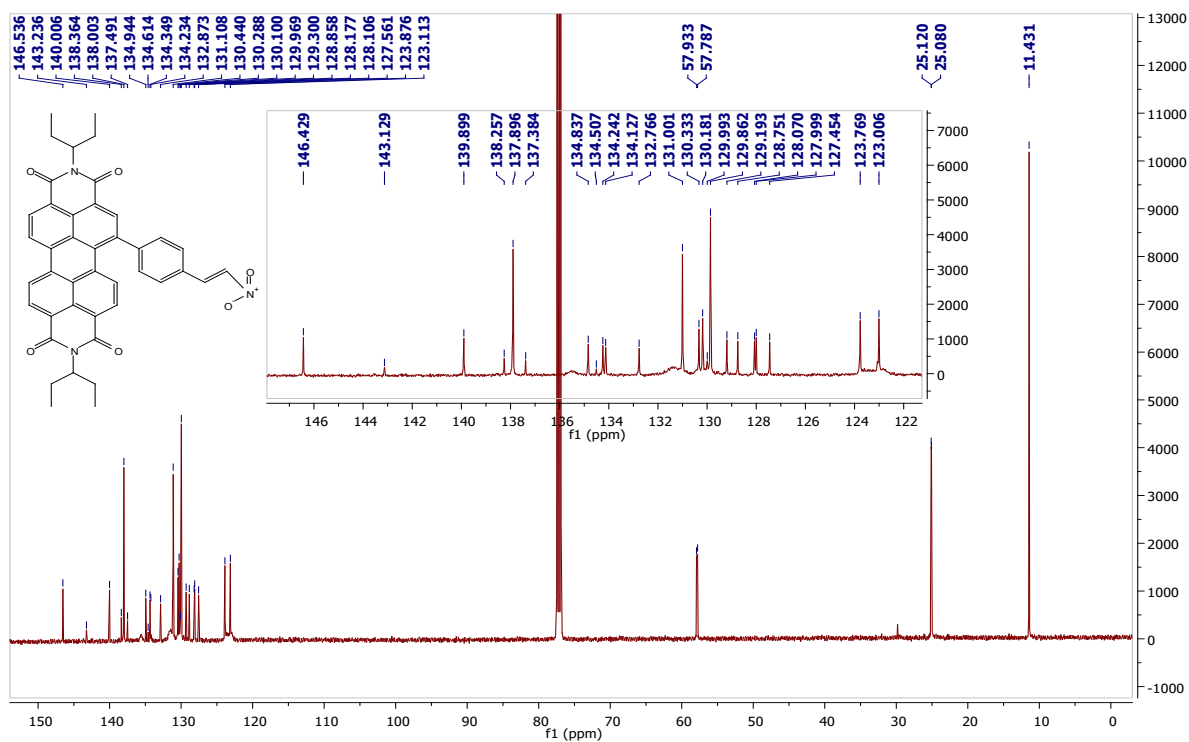


Figure S2. The Carbon (^{13}C) NMR spectrum for PDI 1.

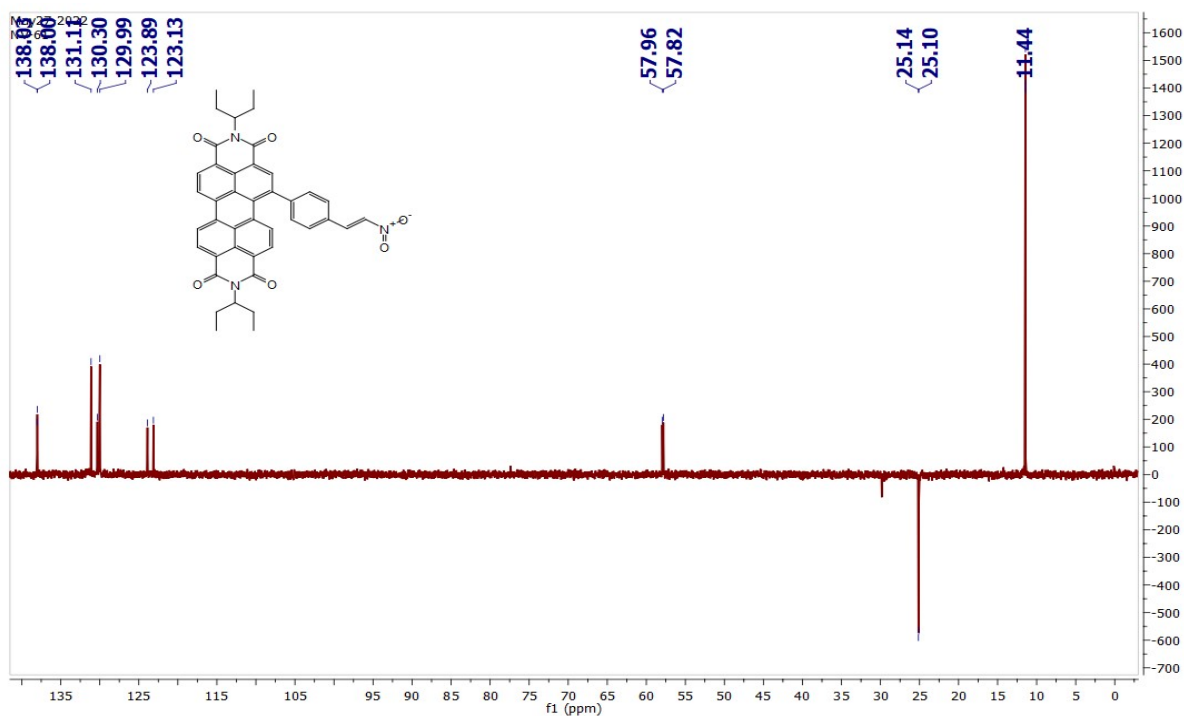


Figure S3. The Carbon DEPT-135 NMR spectrum for PDI 1.

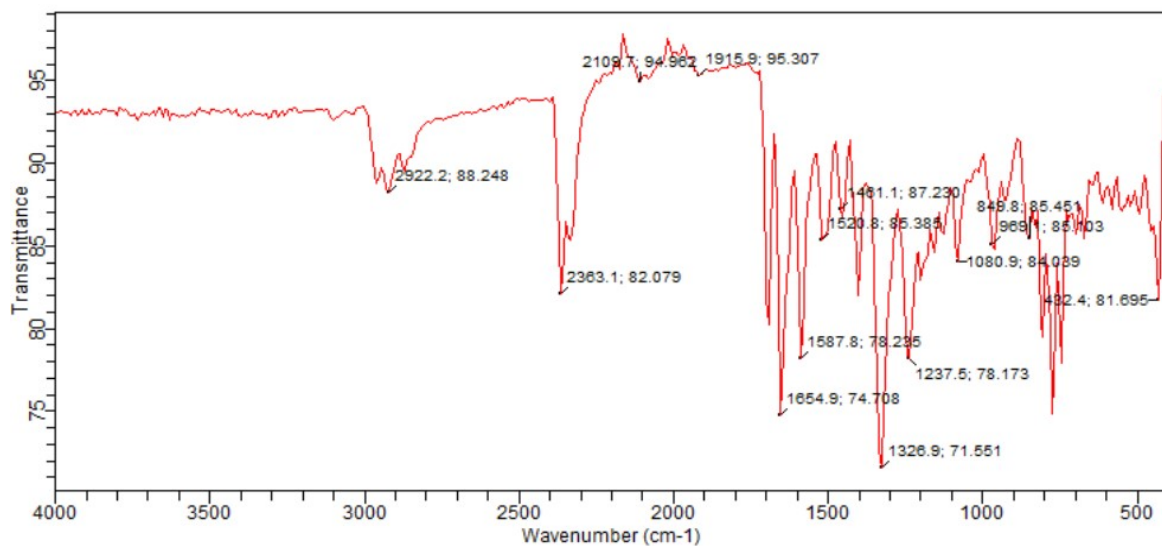


Figure S4. FTIR (ATR) spectrum for PDI 1.

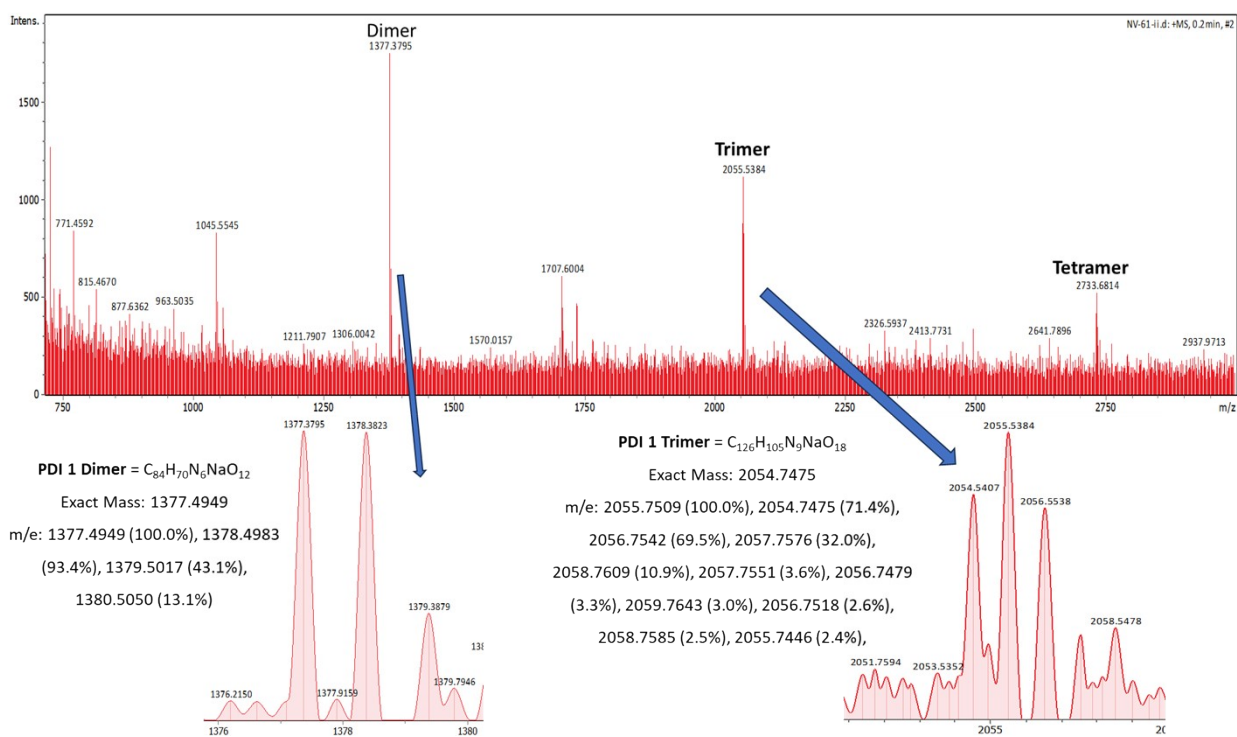


Figure S5. Mass spectrum of PDI 1.

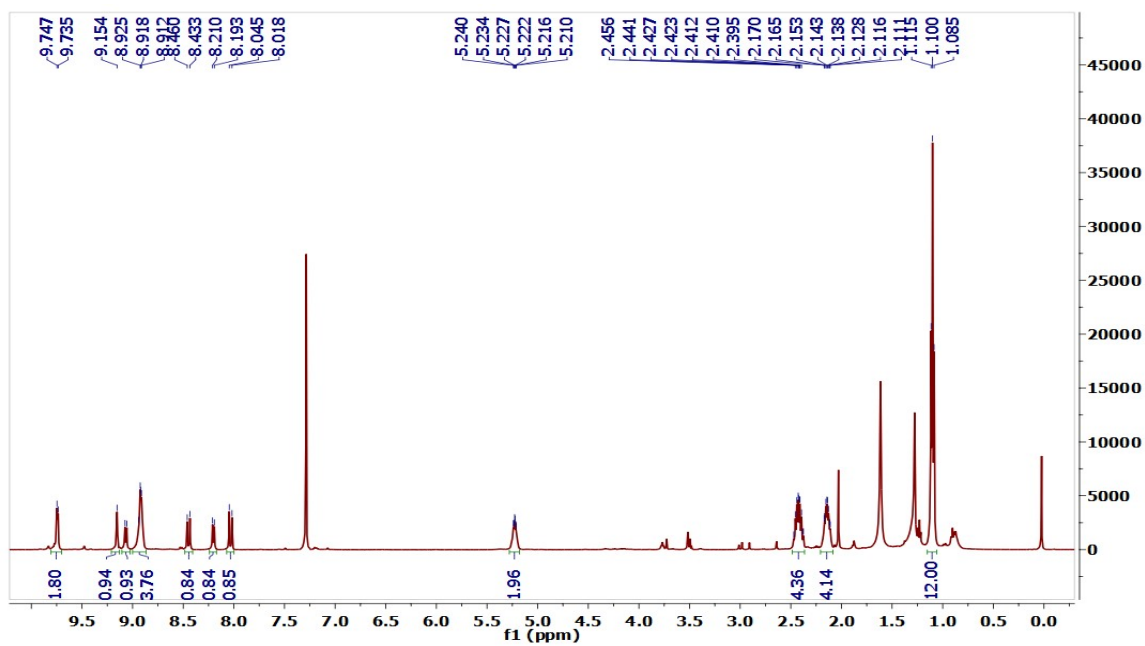


Figure S6. Proton NMR spectrum for CDI 2.

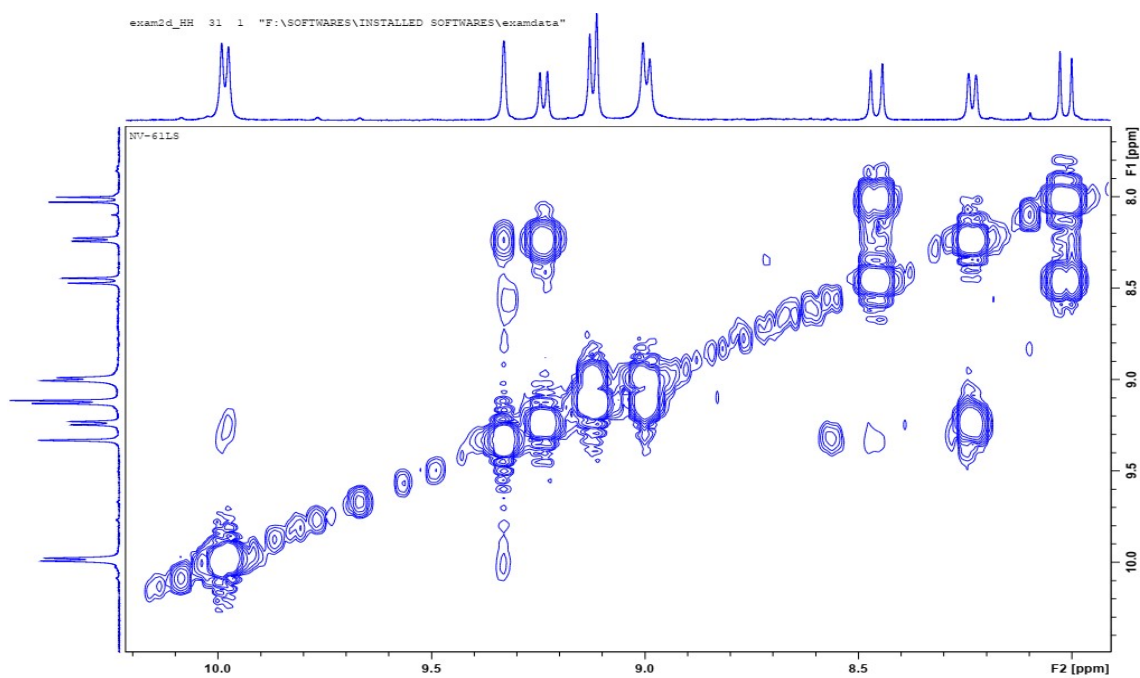


Figure S7. Partial COSY (2D) NMR spectrum for aromatic region of CDI 2.

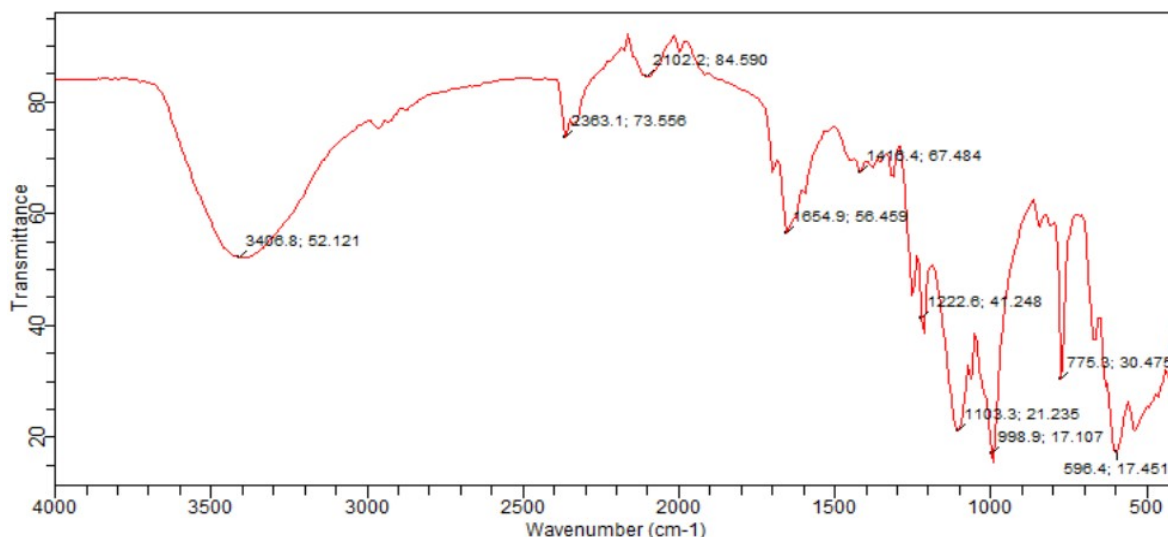


Figure S8. FTIR (ATR) spectrum for CDI 2 radical anion.

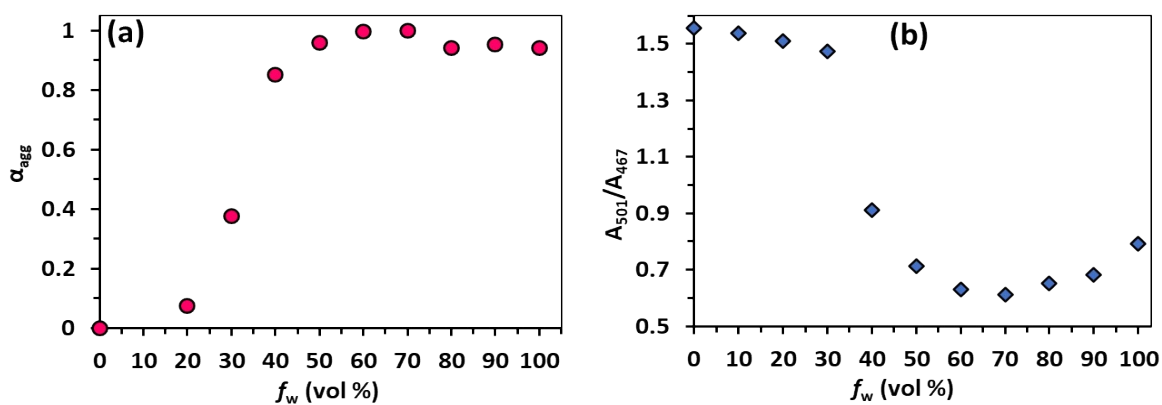


Figure S9: (a) The plot of degree of aggregation and (b) Franck–Condon factor against the volume fraction of water added in THF.

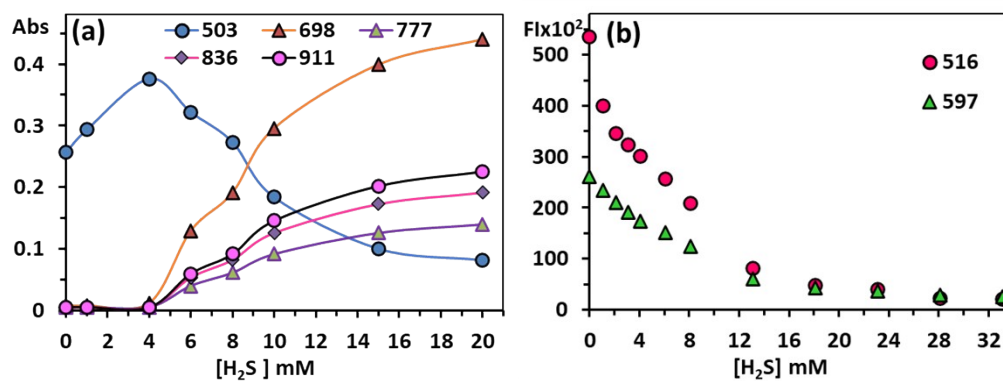


Figure S10: (a) Absorbance and (b) emission intensities plot at different wavelengths against concentrations of H₂S showing the plateau in each titration.

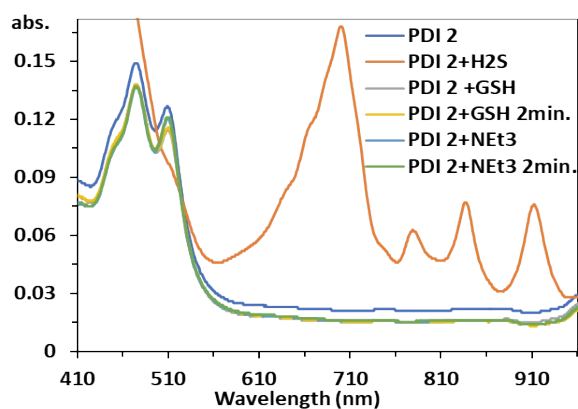


Figure S11: The absorbance spectra of CDI 2 upon addition of triethylamine (NET_3) and glutathione (GSH) recorded immediately and after 2 min. of addition. The absorbance spectra for H_2S have also been added for the comparison.

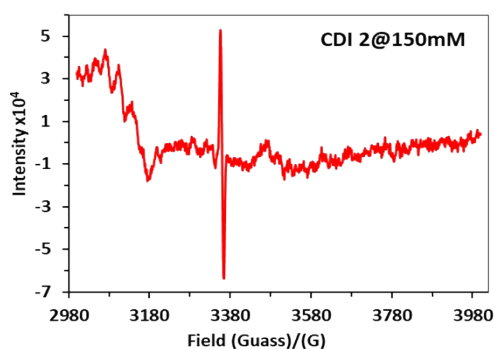


Figure S12: The EPR spectrum of neutral CDI 2 (0.1 mM) in the presence of 150 mM concentration of H_2S (full scale spectrum).

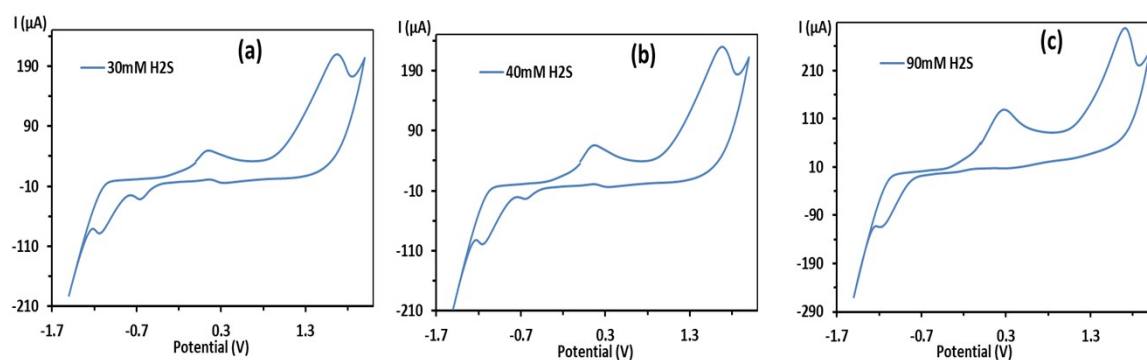


Figure S13: Cyclic voltammetry (CV) plots of CDI 2 (0.1 mM) in the presence of different concentrations of H_2S .

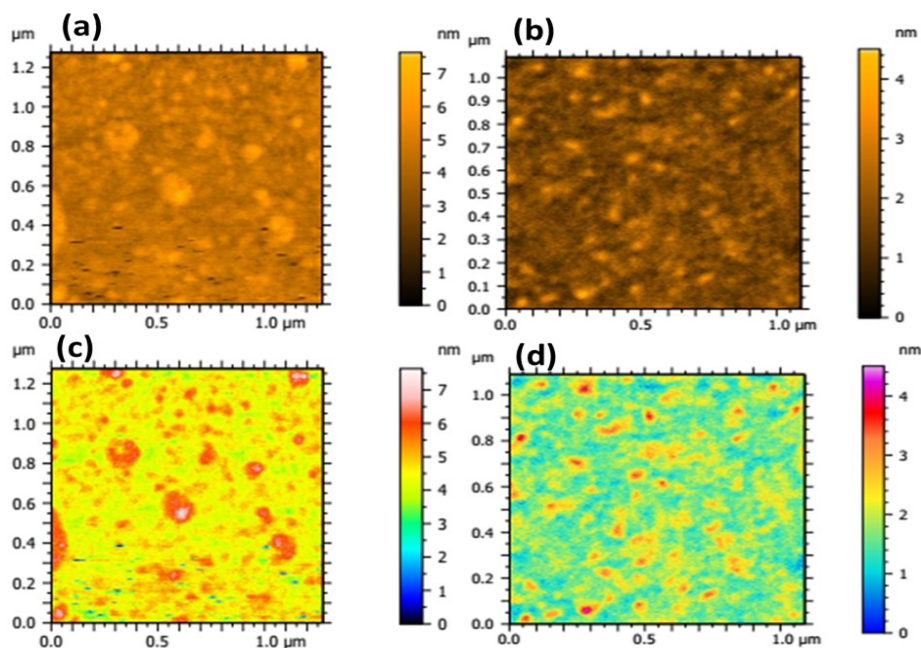


Figure S14: The AFM images of neutral CDI 1 (a, c) and CDI 2⁻ (b, d) recorded on thin films prepared using 5 μM concentrations in 40% HEPES buffer–THF solution.

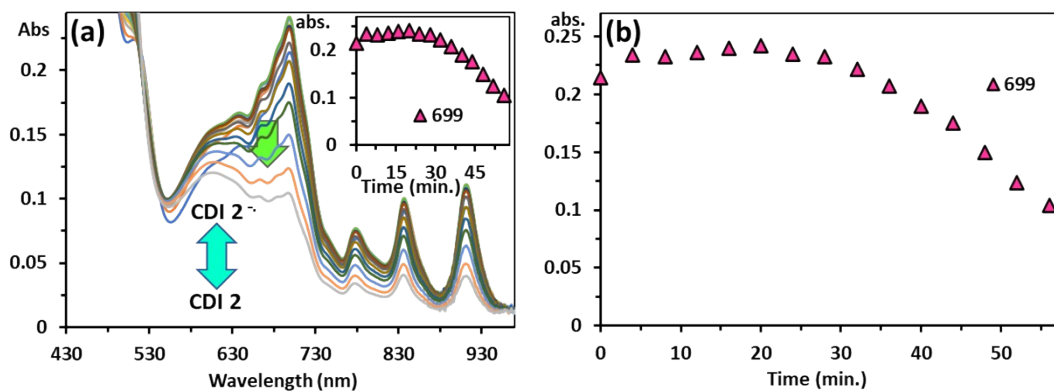


Figure S15: (a,b) Plot of CDI 2⁻ against time to determine the air stability and its corresponding bar graph.

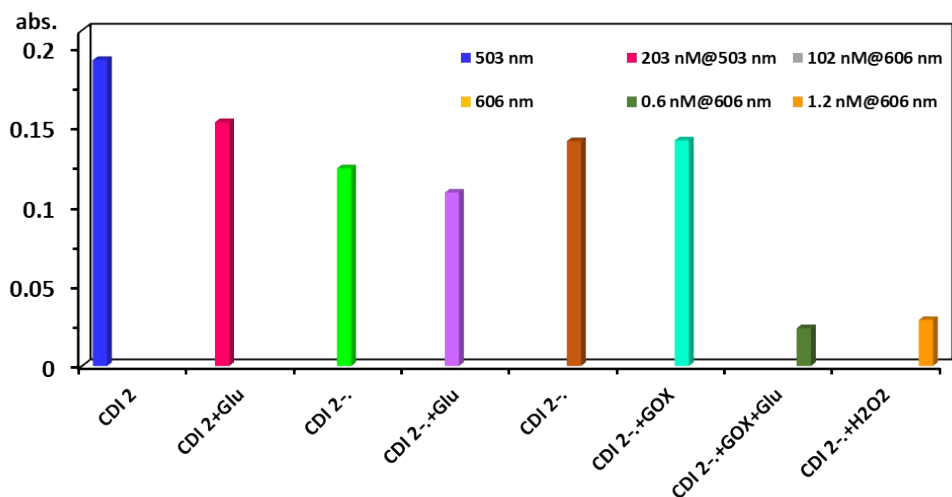


Figure S16: Bar graph showing the effect of glucose and GOx on CDI or CDI 2⁻ using combination of these.

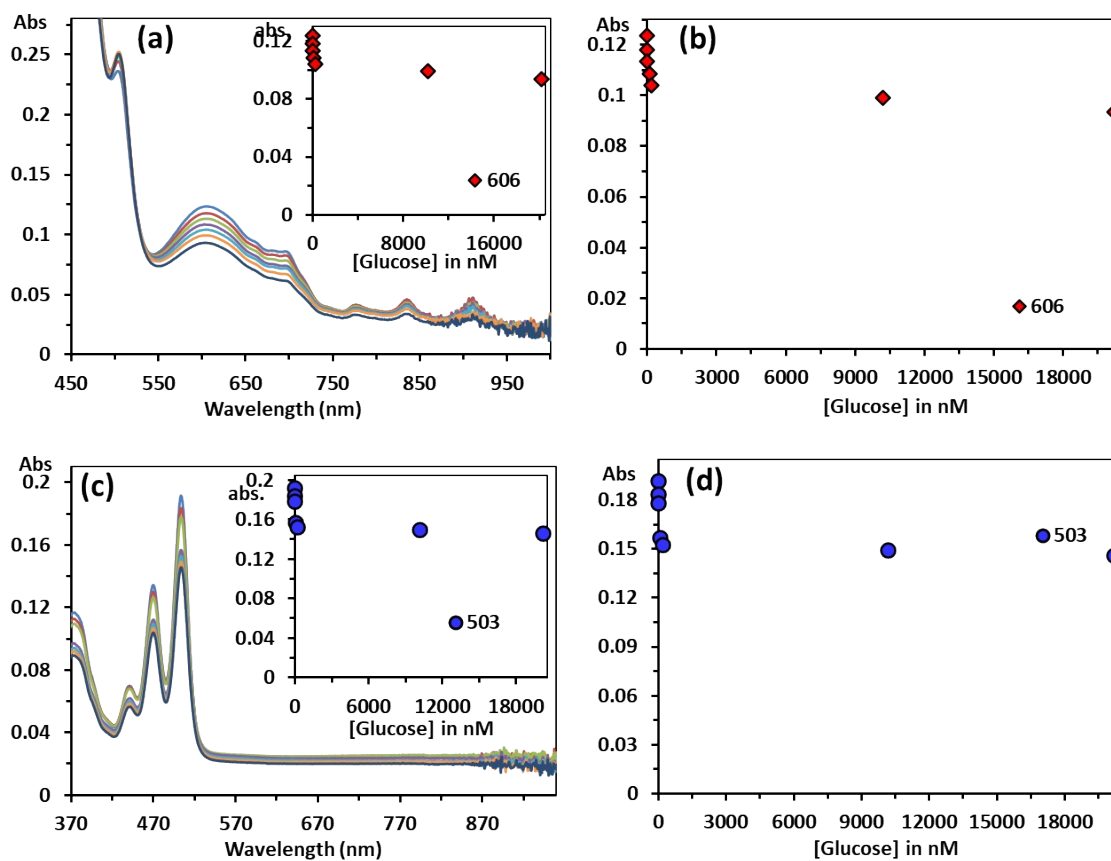


Figure S17: Effect of glucose alone on (a,b) CDI 2⁻ and (c,d) CDI 2 upon addition of micromolar concentrations of glucose.

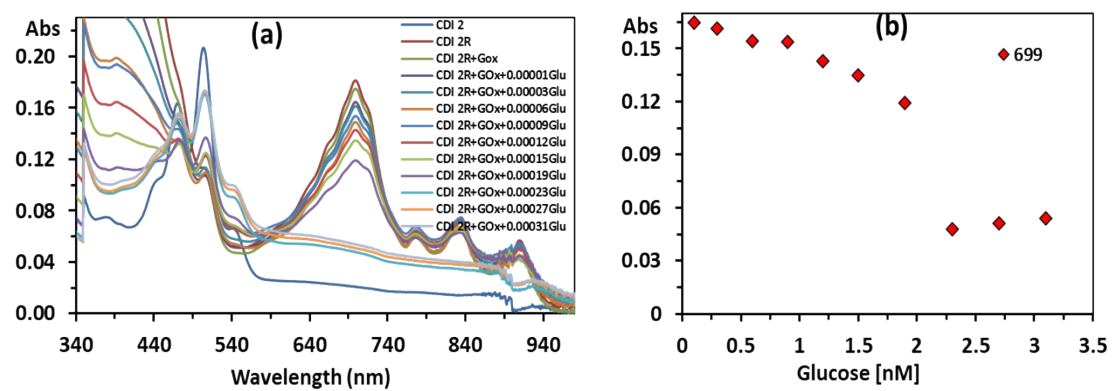


Figure S18: (a) Absorbance spectra and (b) absorbance intensity plot of CDI 2⁻ upon addition of different concentrations of glucose recorded in 40% HEPES buffer-THF solution containing 10% blood serum.