

Cu(II) complex formation with natural pyomelanin and ceftazidime in an aqueous system

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Page 3. **Figure S1. (a)** Potentiometric titration curves for acidic systems: natural pyomelanin and Cu(II) – natural pyomelanin compared with solely HClO₄ and solely Cu(II) ion; $C_{\text{HClO}_4} = 2.0 \times 10^{-2} \text{ mol L}^{-1}$, $C_{\text{pyomelanin}} = 0.4 \text{ mg mL}^{-1}$, $C_{\text{Cu}} = 3.5 \times 10^{-4} \text{ mol L}^{-1}$. **(b)** Narrowed part of the titration curve for natural pyomelanin.

Page 4. **Figure S2.** UV spectra of 0.4 mg mL^{-1} of the natural pyomelanin, recorded over the 200-900 nm range, within the pH range **(a)** 2.48-5.17, **(b)** 5.17-10.99. For clarity, the baseline has been removed from the spectral plots.

- Page 5. **Figure S3.** UV spectra of 0.4 mg mL^{-1} of the natural pyomelanin within the pH range **(a)** 2.48 – 5.17, **(b)** 5.17-10.99. For clarity, the baseline has been removed from the spectral plots.
- Page 6. **Figure S4.** UV-Vis absorption spectra of the Cu(II) – natural pyomelanin system, recorded over the 200-900 nm range, within the pH range 2.29 to 6.33 (the line at pH 6.33 corresponds to the beginning of disturbances caused by precipitation); $C_{\text{pyomelanin}} = 0.4 \text{ mg mL}^{-1}$, $C_{\text{Cu}} = 3.5 \times 10^{-4} \text{ mol L}^{-1}$. For clarity, the baseline has been removed from the spectral plots.
- Page 7. **Figure S5.** Potentiometric titration curves for acidic systems: ceftazidime and Cu(II) – ceftazidime compared with solely HClO_4 and solely Cu(II) ion; $C_{\text{HClO}_4} = 2.0 \times 10^{-2} \text{ mol L}^{-1}$, $C_{\text{ceftazidime}} = 3.6 \times 10^{-3} \text{ mol L}^{-1}$, $C_{\text{Cu}} = 1.8 \times 10^{-3} \text{ mol L}^{-1}$.
- Page 8. **Figure S6. (a)** UV spectra of ceftazidime within the pH range 1.82 – 12.03, $C_{\text{ceftazidime}} = 1 \times 10^{-5} \text{ M}$. For clarity, the baseline has been removed from the spectral plots. **(b)** Molar absorption coefficients for various ceftazidime forms.
- Page 9. **Figure S7.** UV-Vis absorption spectra of the heteroligand Cu(II) – natural pyomelanin – ceftazidime system, recorded over the 200-1100 nm range, within the pH range 2.37 – 12.05; $C_{\text{pyomelanin}} = 0.4 \text{ mg mL}^{-1}$, $C_{\text{ceftazidime}} = 3.6 \times 10^{-3} \text{ mol L}^{-1}$; $C_{\text{Cu}} = 1.8 \times 10^{-3} \text{ mol L}^{-1}$. For clarity, the baseline has been removed from the spectral plots.
- Page 10. **Figure S8.** UV-Vis absorption spectra of the heteroligand Cu(II) – natural pyomelanin – ceftazidime system, within the pH range 2.37 – 12.05; $C_{\text{pyomelanin}} = 0.4 \text{ mg mL}^{-1}$, $C_{\text{ceftazidime}} = 3.6 \times 10^{-3} \text{ mol L}^{-1}$; $C_{\text{Cu}} = 1.8 \times 10^{-3} \text{ mol L}^{-1}$. For clarity, the baseline has been removed from the spectral plots.

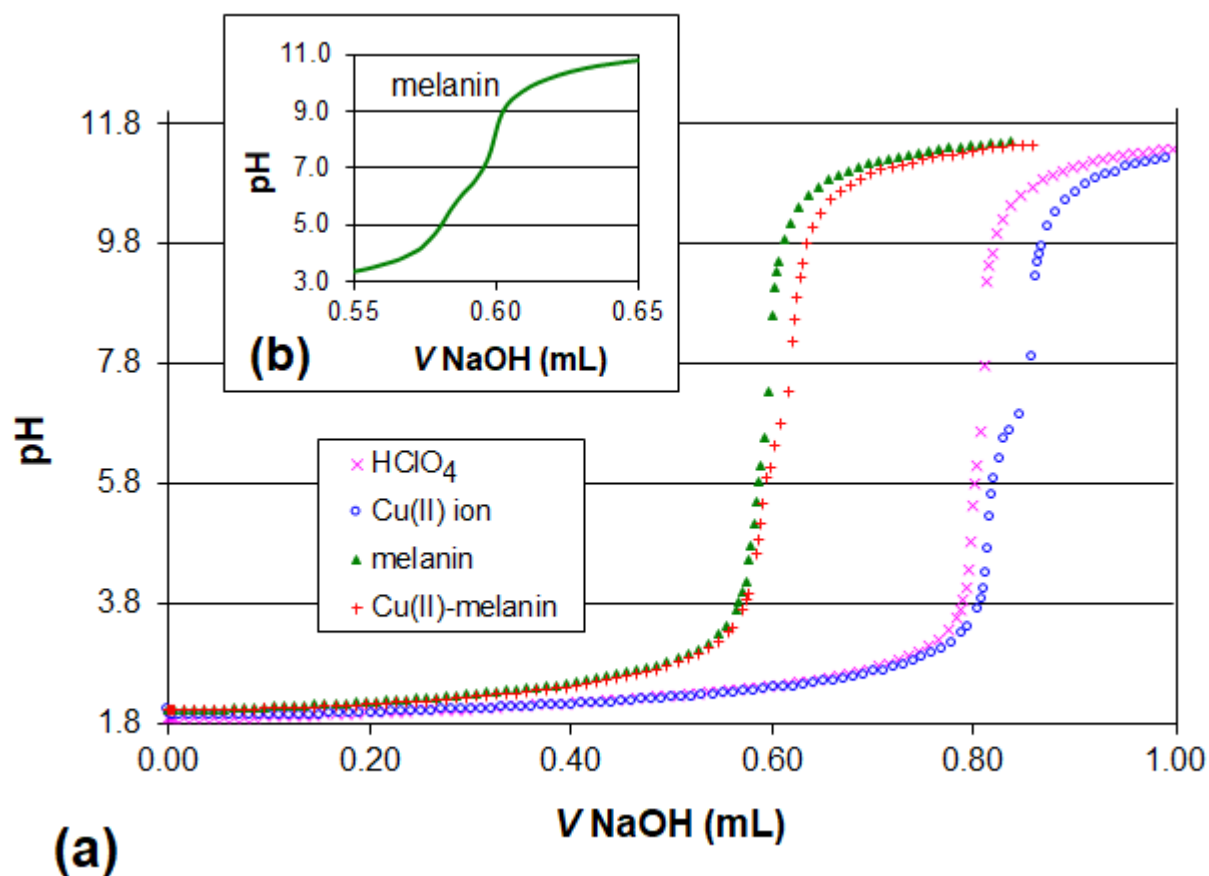


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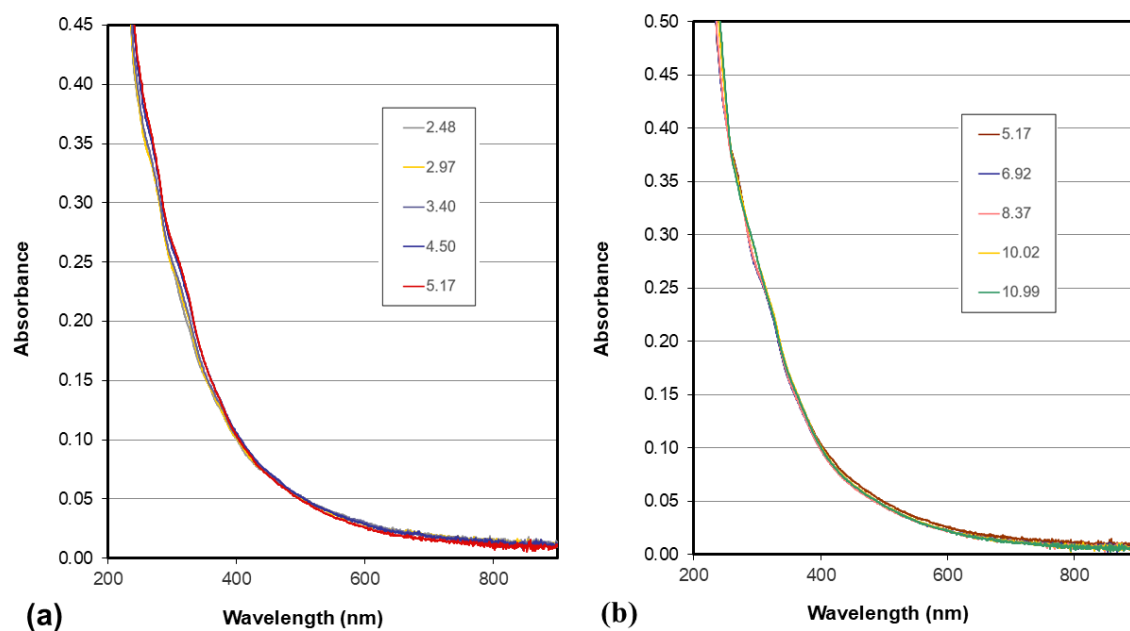


Figure S2. UV spectra of 0.4 mg mL^{-1} of the natural pyomelanin, recorded over the 200-900 nm range, within the pH range **(a)** 2.48-5.17, **(b)** 5.17-10.99. For clarity, the baseline has been removed from the spectral plots.

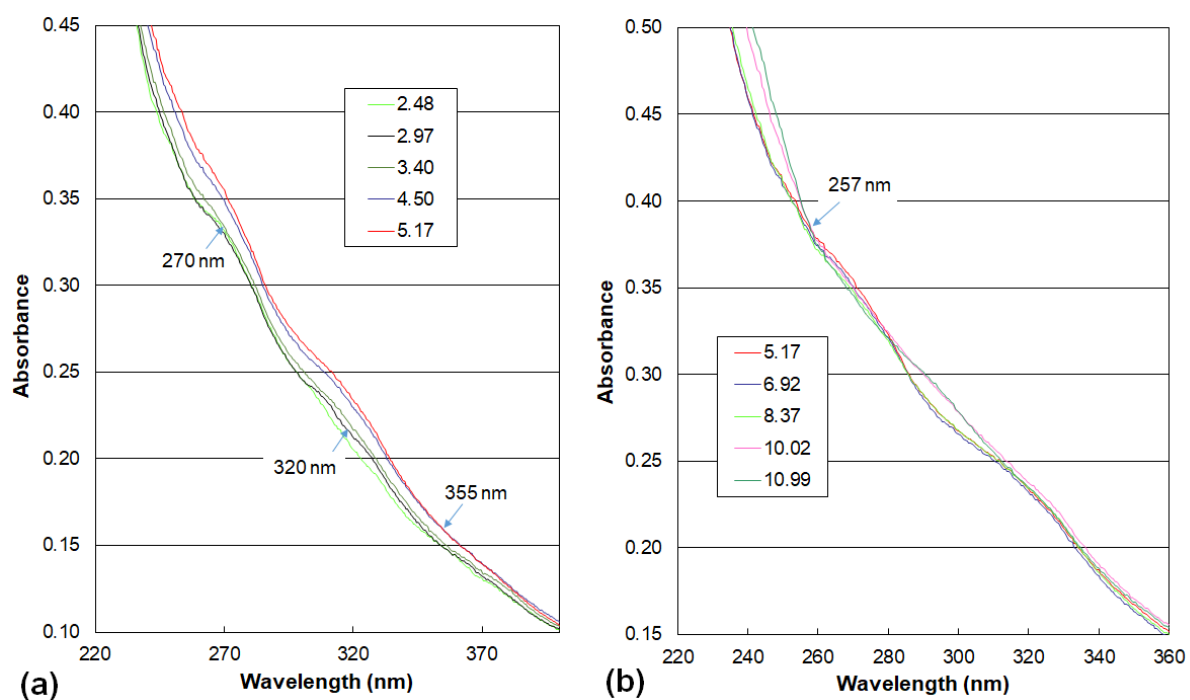


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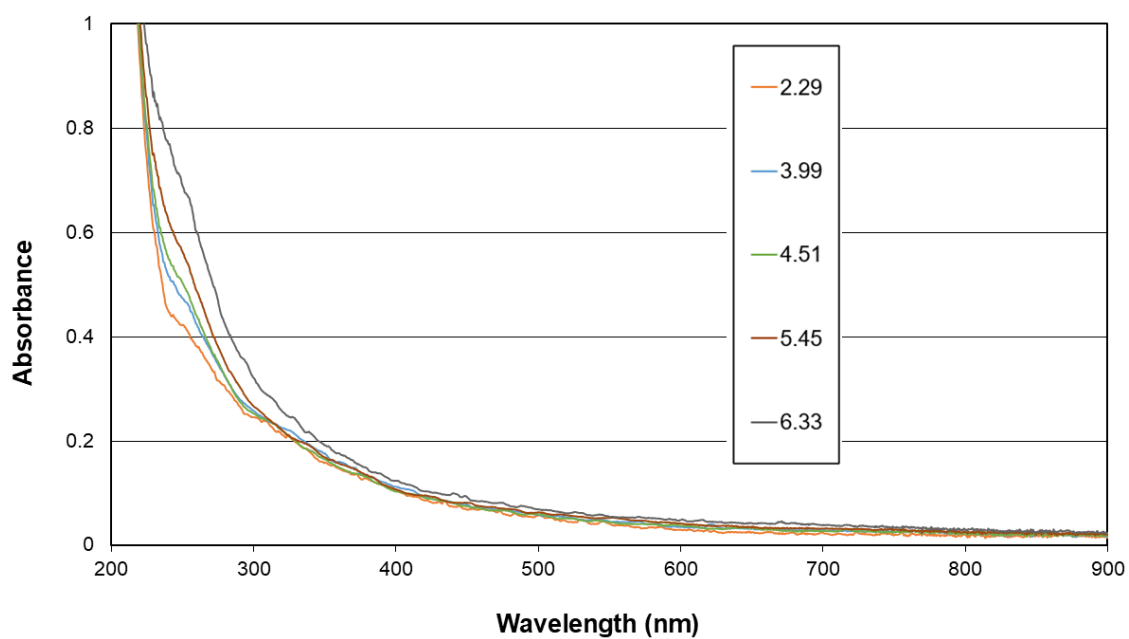


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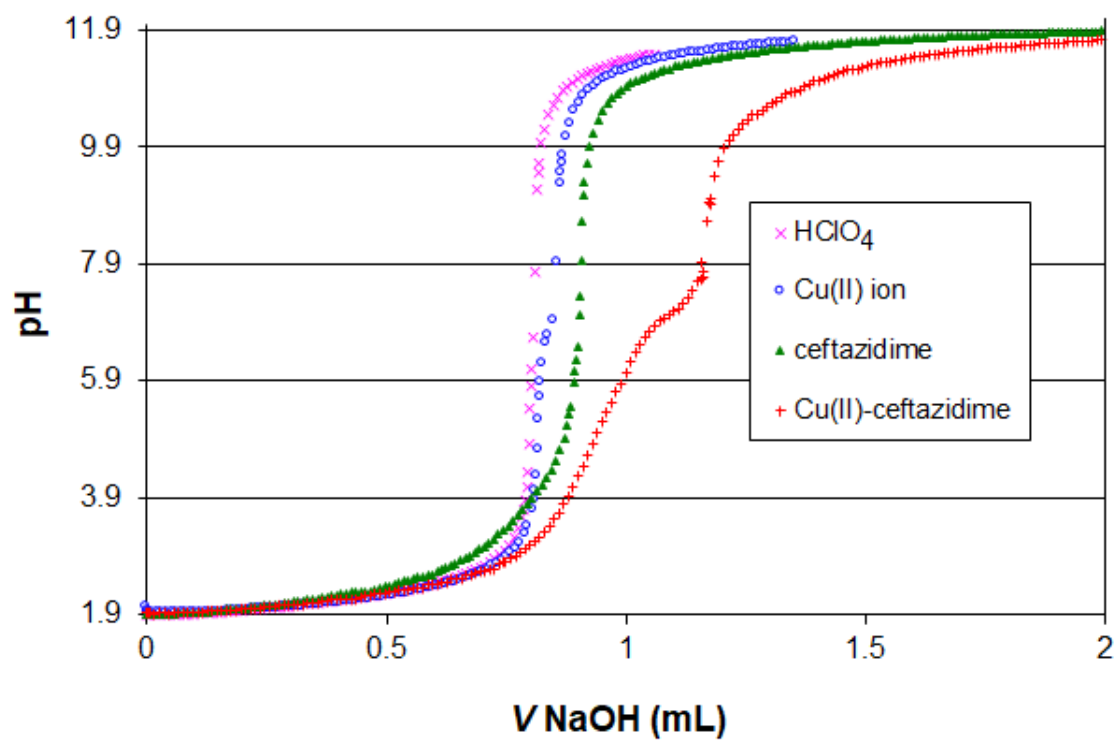


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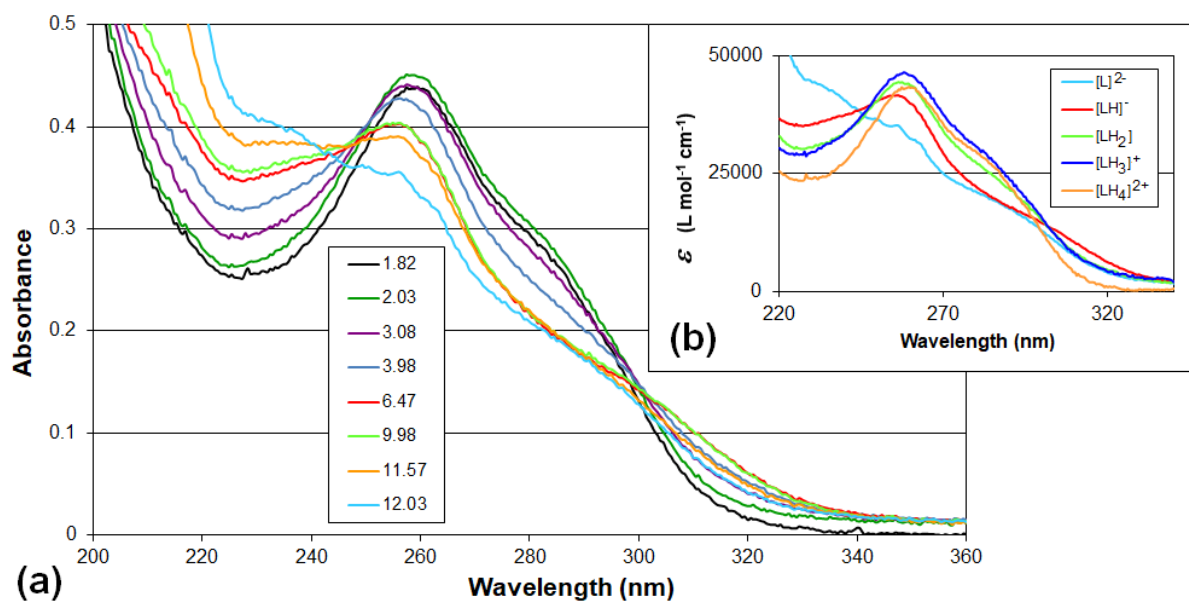


Figure S6. (a) UV spectra of ceftazidime within the pH range 1.82 – 12.03, $C_{\text{ceftazidime}} = 1 \times 10^{-5} \text{ mol L}^{-1}$. For clarity, the baseline has been removed from the spectral plots. **(b)** Molar absorption coefficients for various ceftazidime forms.

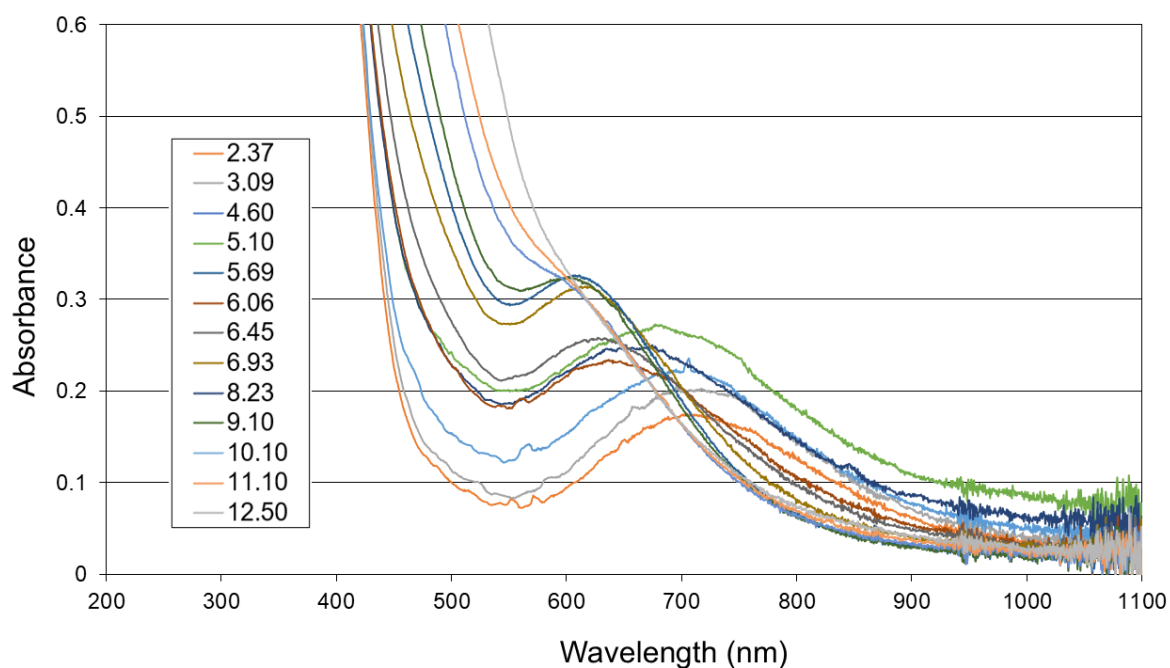


Figure S7. UV-Vis absorption spectra of the heteroligand Cu(II) – natural pyomelanin – ceftazidime system, recorded over the 200-1100 nm range, within the pH range 2.37 – 12.05; $C_{\text{pyomelanin}} = 0.4 \text{ mg mL}^{-1}$, $C_{\text{ceftazidime}} = 3.6 \times 10^{-3} \text{ mol L}^{-1}$; $C_{\text{Cu}} = 1.8 \times 10^{-3} \text{ mol L}^{-1}$. For clarity, the baseline has been removed from the spectral plots.

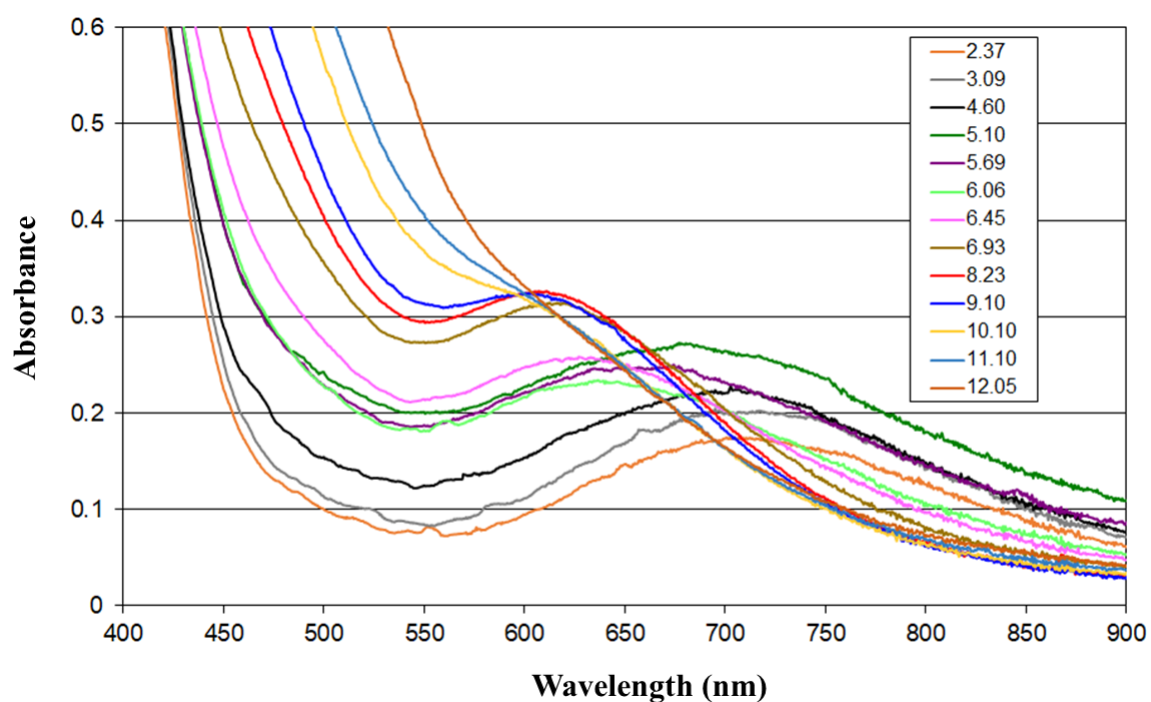


Figure S8. UV-Vis absorption spectra of the heteroligand Cu(II) – natural pyomelanin – ceftazidime system, within the pH range 2.37 – 12.05; $C_{\text{pyomelanin}} = 0.4 \text{ mg mL}^{-1}$, $C_{\text{ceftazidime}} = 3.6 \times 10^{-3} \text{ mol L}^{-1}$; $C_{\text{Cu}} = 1.8 \times 10^{-3} \text{ mol L}^{-1}$. For clarity, the baseline has been removed from the spectral plots.