Electronic Supplementary Material (ESI) for RSC Advances.

Block Copolymer and Organic Salts in Forming Aqueous Biphases: A Platform to Identify Molecular Interactions in Aqueous Medium

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Determination of Tie line (TL): Each TL was determined by the lever-arm rule through the relationship between the top phase composition and the overall system composition. For this the following system of four equations (eqns S1 – S4) and four unknown factors were solved.

$$Y_T = Aexp\left[\left(B \times X_T^{0.5}\right) - \left(C \times X_T^3\right)\right] \quad \text{(S1)}$$

$$Y_B = Aexp\left[\left(B \times X_B^{0.5}\right) - \left(C \times X_B^3\right)\right] \quad \text{(S2)}$$

$$Y_T = \left(\frac{Y_M}{\alpha}\right) - \frac{1 - \alpha}{\alpha} \times Y_B \quad \text{(S3)}$$

$$X_T = \left(\frac{X_M}{\alpha}\right) - \frac{1 - \alpha}{\alpha} \times X_B \quad \text{(S4)}$$

Where T, B, and M, are assigned to the top phase, the bottom phase and the mixture, respectively; X and Y represent the equilibrium weight fraction percentages of the salt and tri block copolymer; α is the ratio between the mass of the top phase and the total mass of the mixture. Each tie-line length (TLL) and slope of the tie-lines (STL) could be obtained using the following equations:

$$TLL = \sqrt{(X_T - X_B)^2 + (Y_T - Y_B)^2} \quad \text{(S5)}$$

$$STL = (Y_T - Y_B) / (X_T - X_B) \quad \text{(S6)}$$

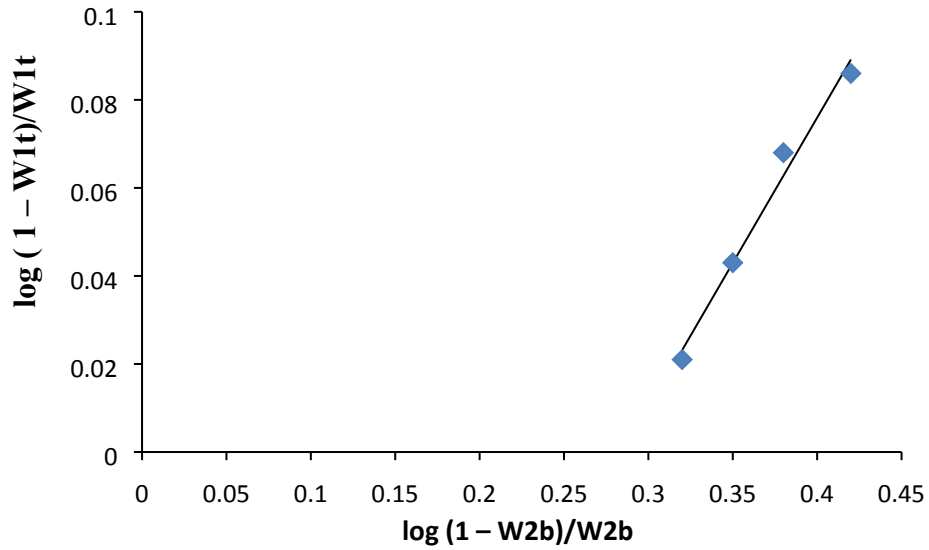


Figure S1: Othmer-Tobias plot of PPG-PEG-PPG – sodium acetate system.

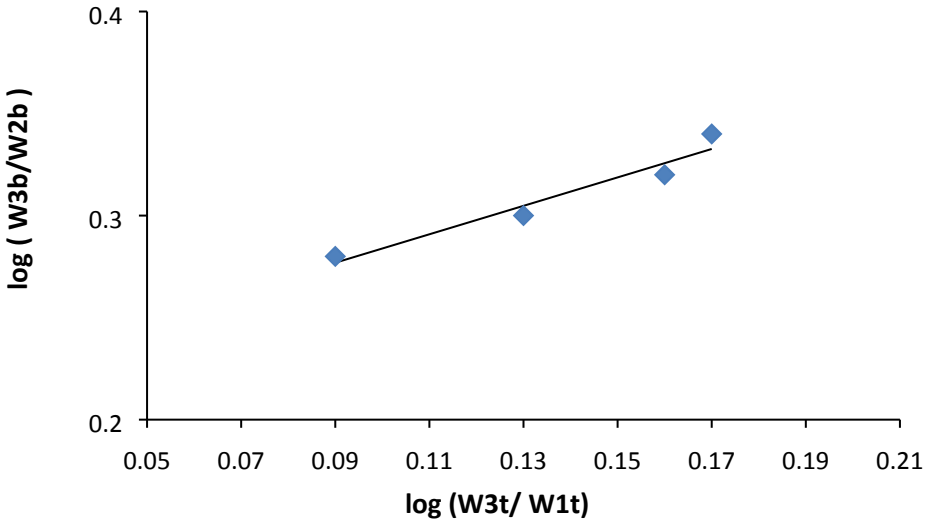


Figure S2: Bancroft plot of PPG-PEG-PPG – sodium acetate system.

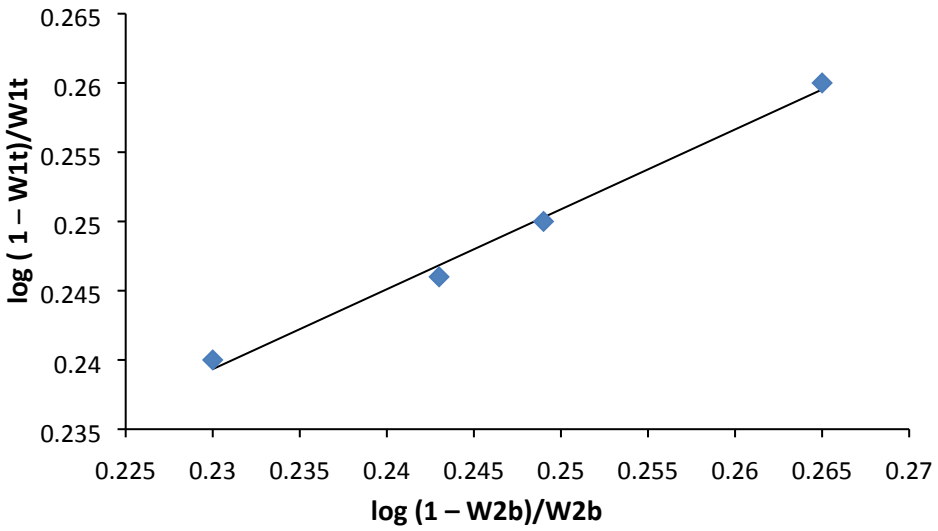


Figure S3: Othmer-Tobias plot of PPG-PEG-PPG – sodium citrate system.

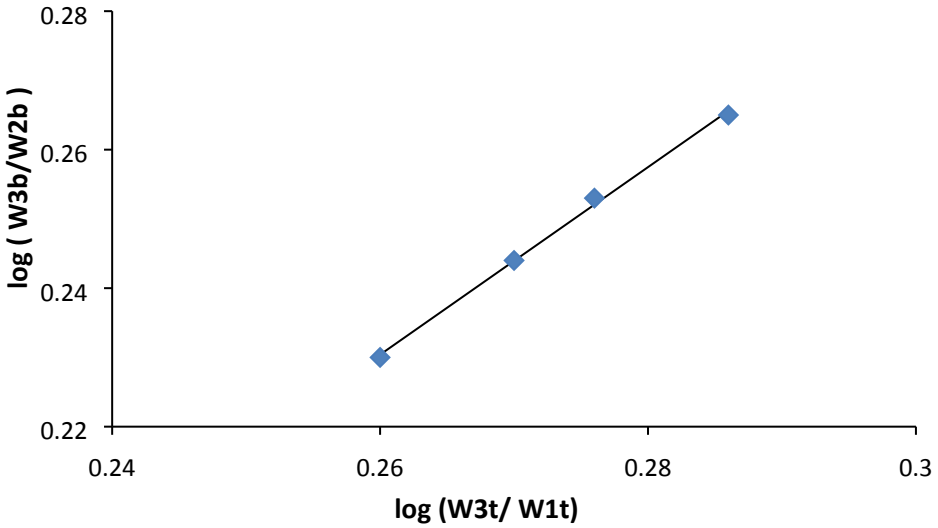


Figure S4: Bancroft plot of PPG-PEG-PPG – sodium citrate system.

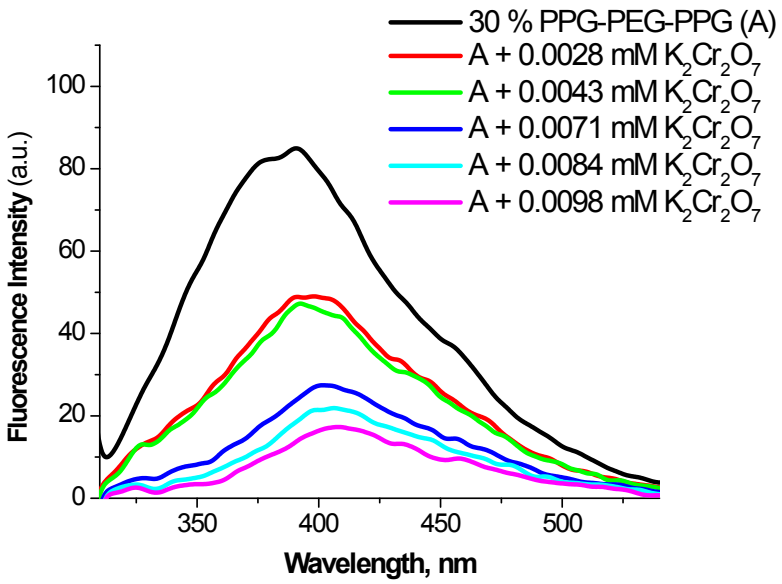


Figure S5: Fluorescence quenching plot of PPG-PEG-PPG

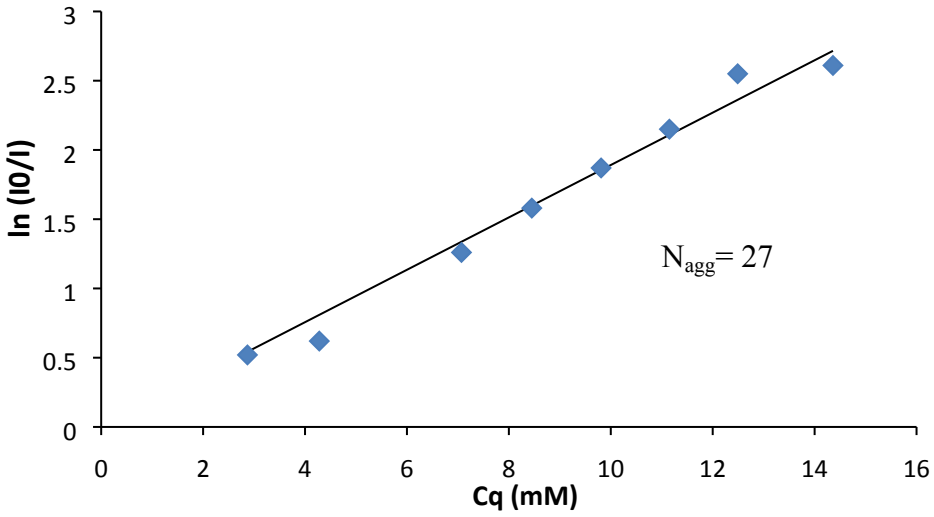


Figure S6: Plot for obtaining aggregation number of PPG-PEG-PPG

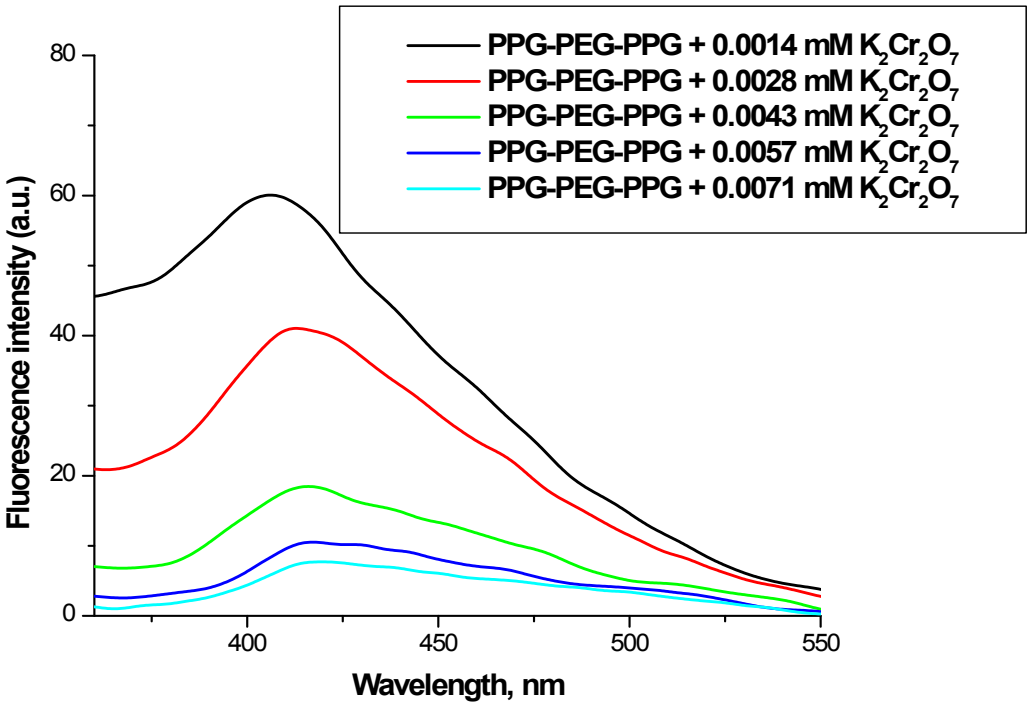


Figure S7: Fluorescence quenching plot of PPG-PEG-PPG obtained from PPG-PEG-PPG/ Na-acetate ABS.

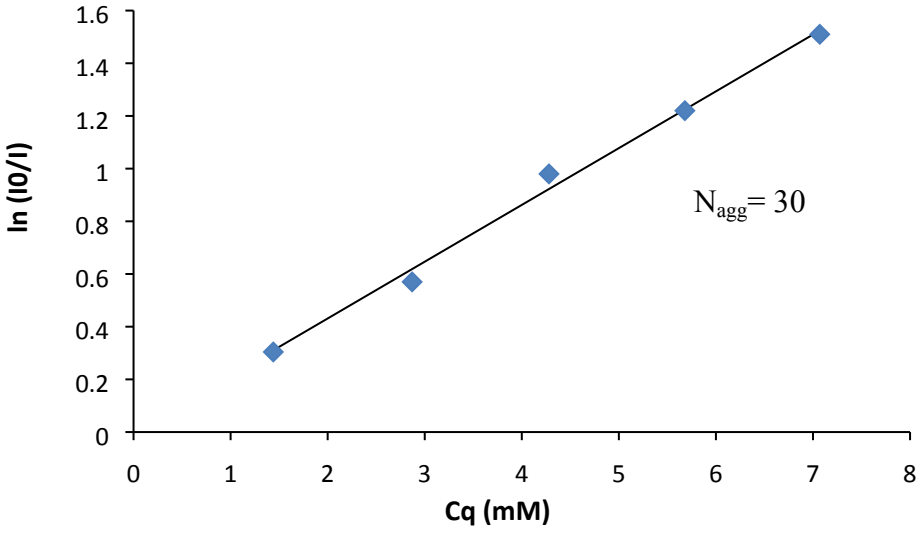


Figure S8: Fluorescence plot for aggregation number of PPG-PEG-PPG from PPG-PEG-PPG acetate ABS.

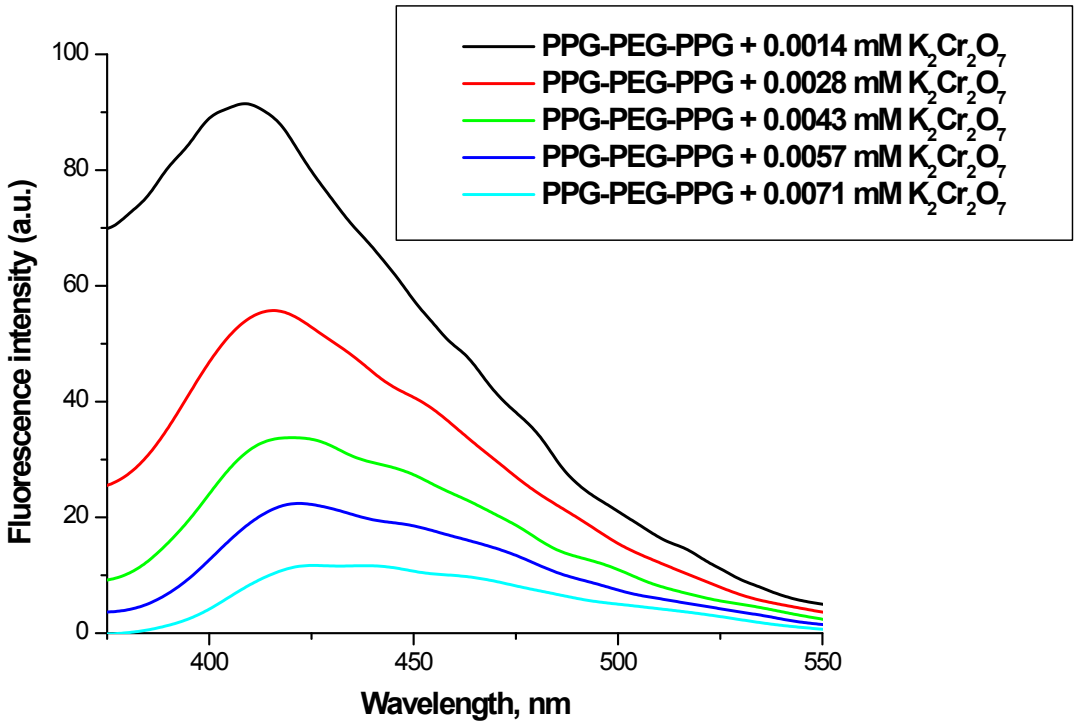


Figure S9: Fluorescence quenching plot of PPG-PEG-PPG obtained from PPG-PEG-PPG/ Na-citrate ABS.

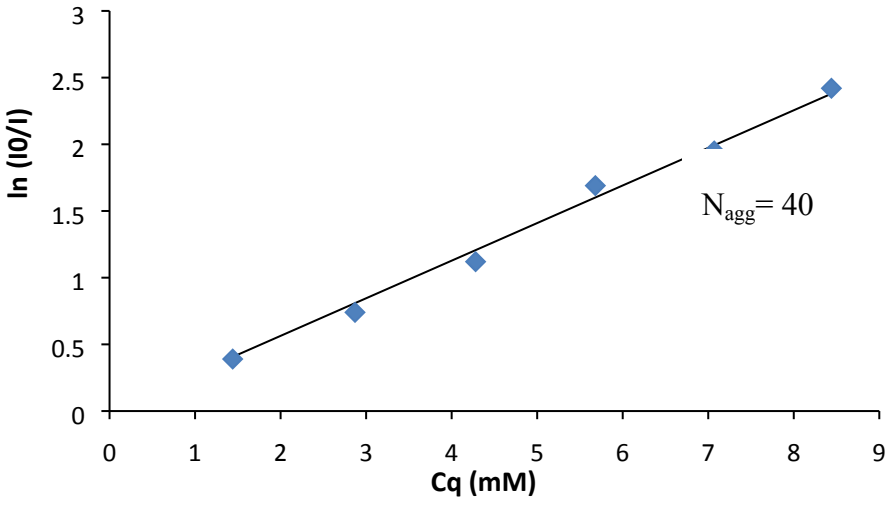


Figure S10: Fluorescence plot for aggregation number of PPG-PEG-PPG from PPG-PEG-PPG citrate ABS.

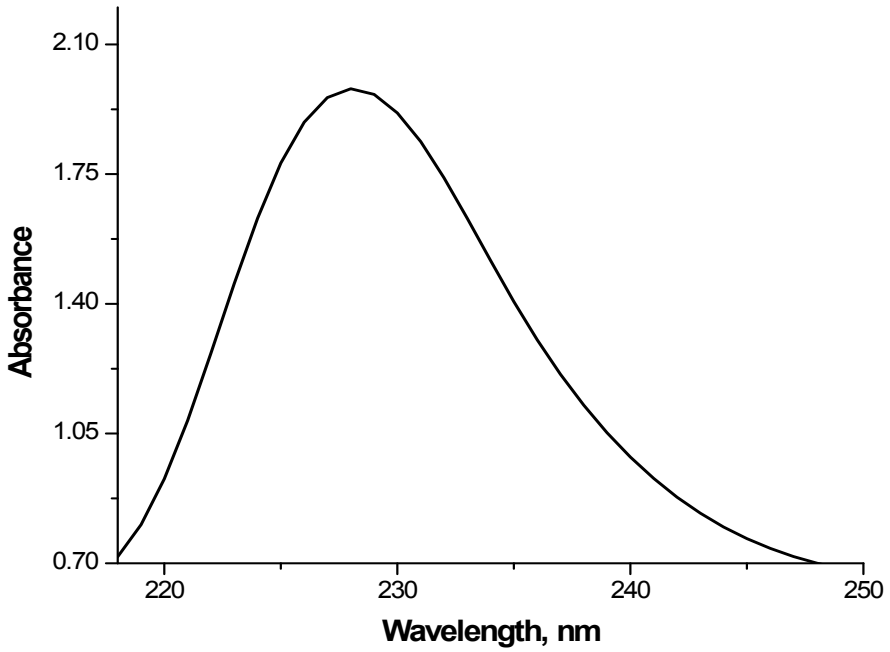


Figure S11: Absorbance spectrum of thiamine in polymer medium.

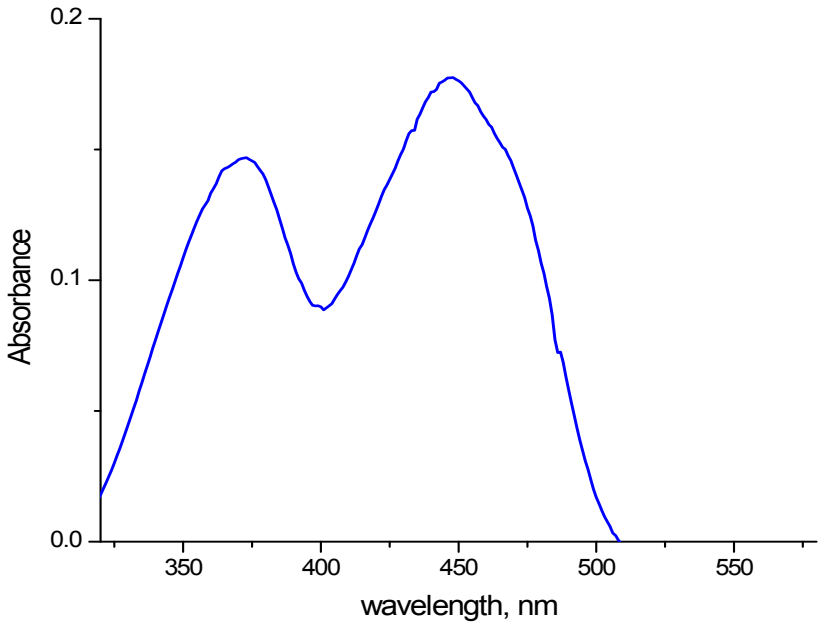


Figure S12: Absorbance spectrum of riboflavin in polymer medium.

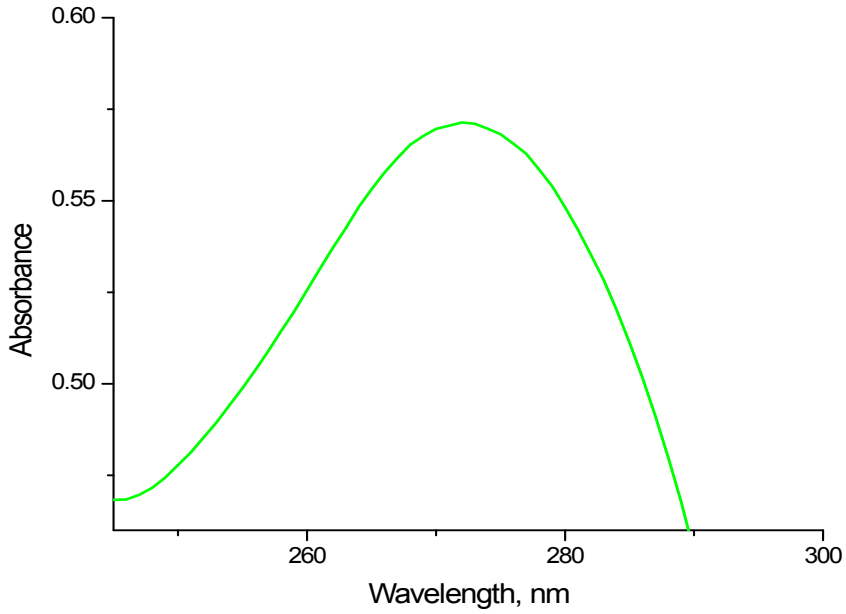


Figure S13: Absorbance spectrum of cholecalciferol in polymer medium.

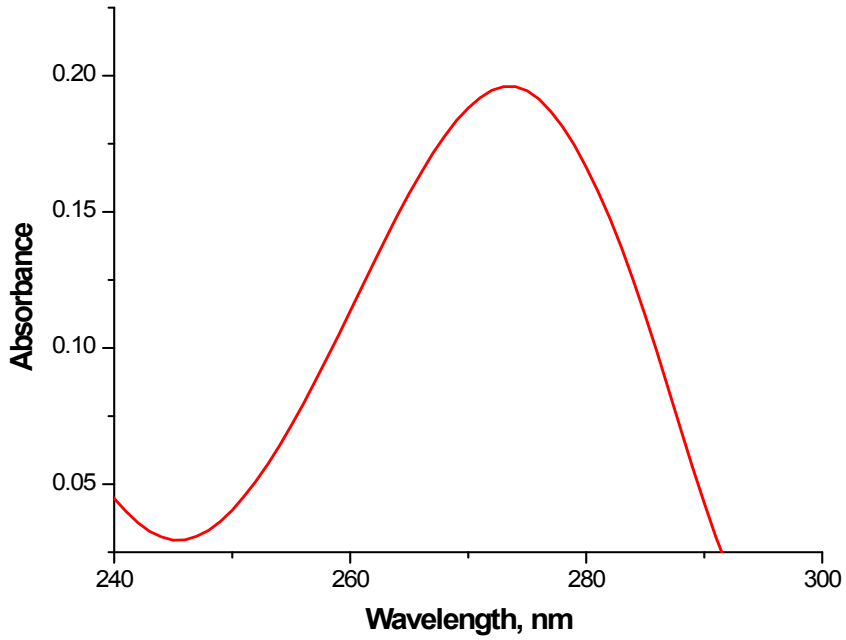


Figure S14: Absorbance spectrum of caffeine in polymer medium.

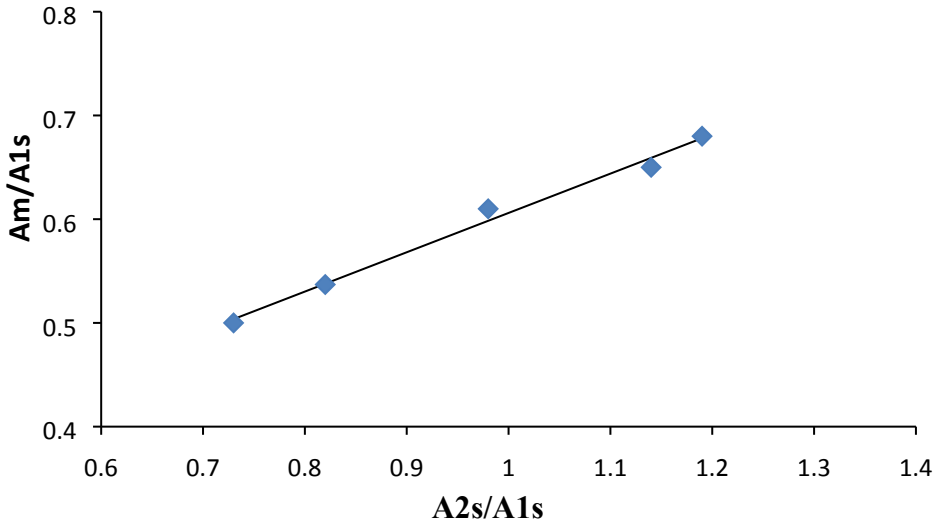


Figure S15: Multi-wavelength linear regression plot of caffeine and vitamin D mixture at pH 5.

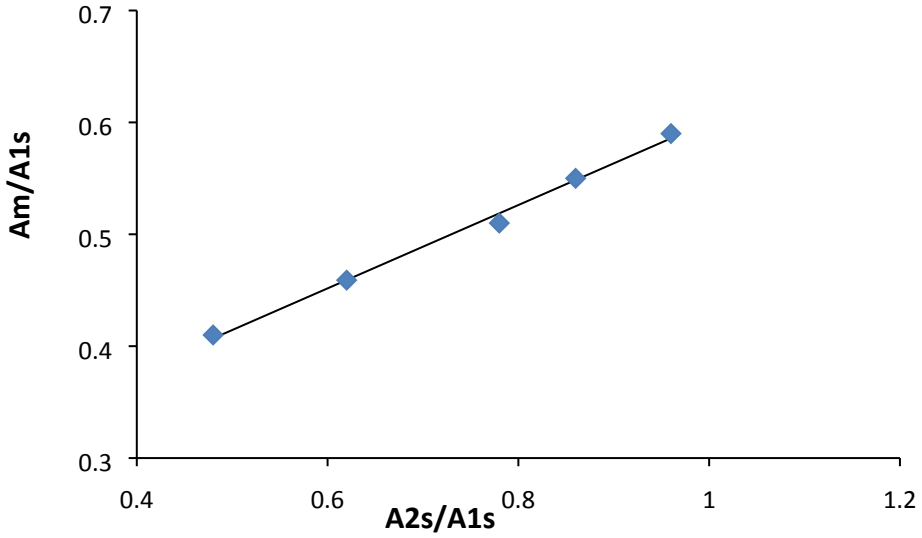


Figure S16: Multi-wavelength linear regression plot of caffeine and vitamin D mixture at pH 5.5.

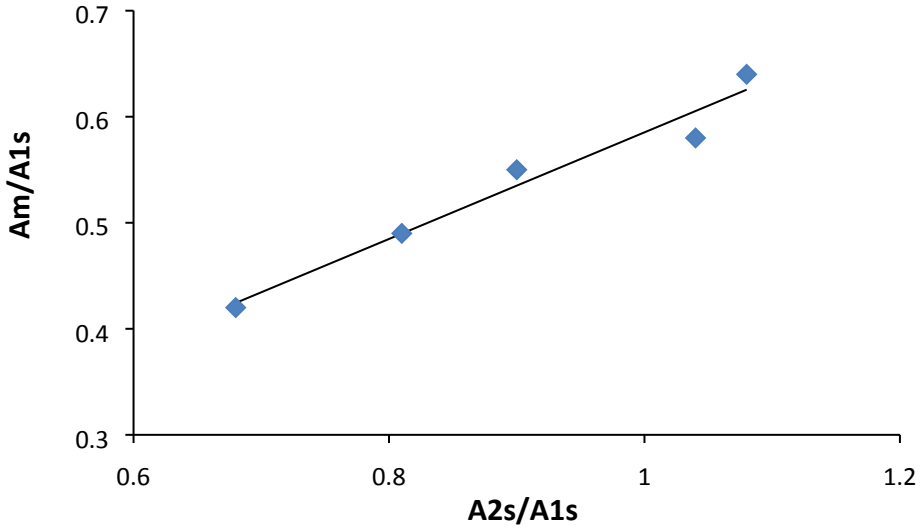


Figure S17: Multi-wavelength linear regression plot of caffeine and vitamin D mixture at pH 6.5.

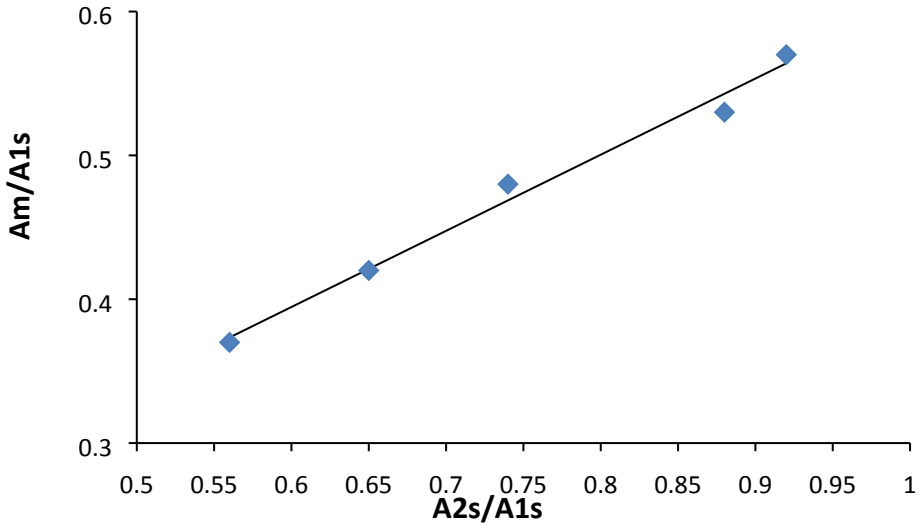


Figure S18: Multi-wavelength linear regression plot of caffeine and vitamin D mixture at pH 7.5.

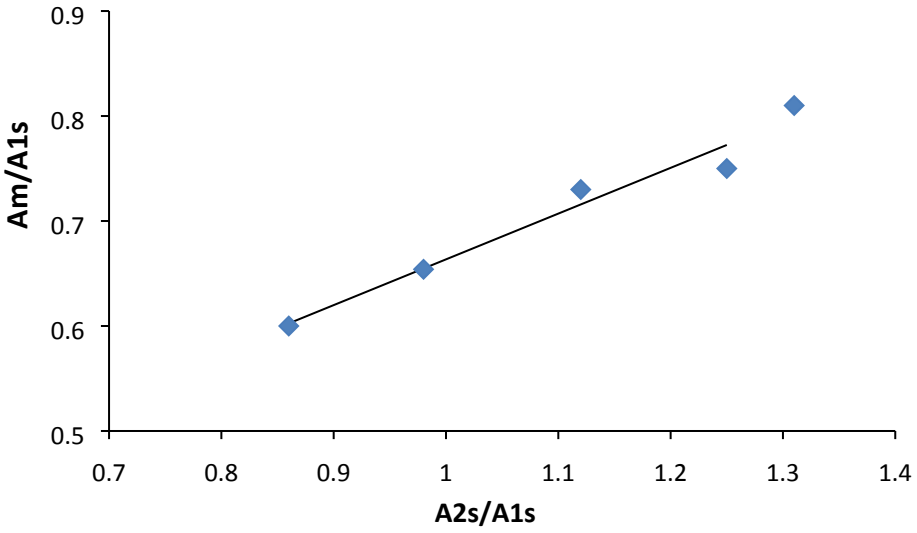


Figure S19: Multi-wavelength linear regression plot of caffeine and vitamin D mixture at pH 8.5.

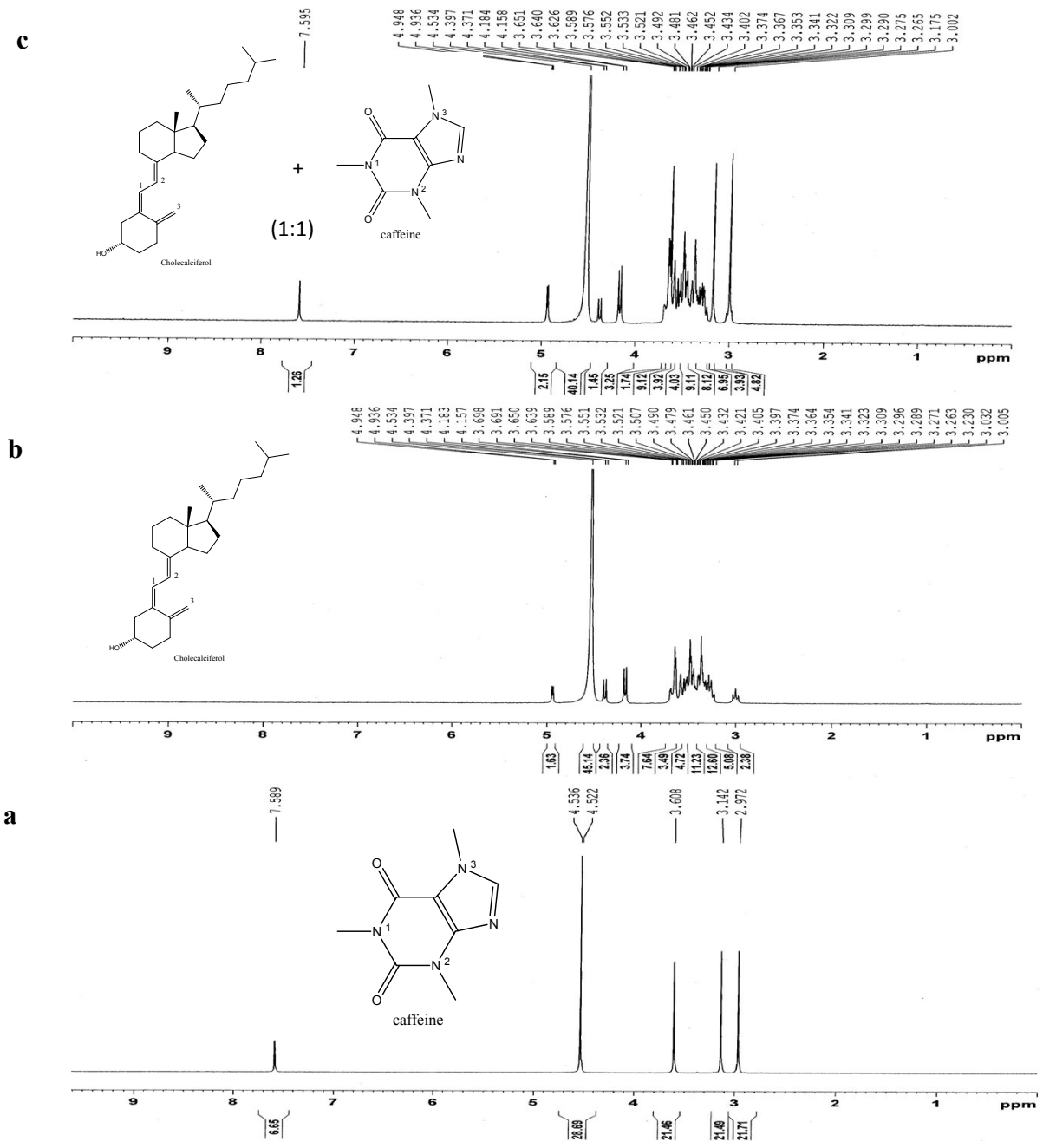
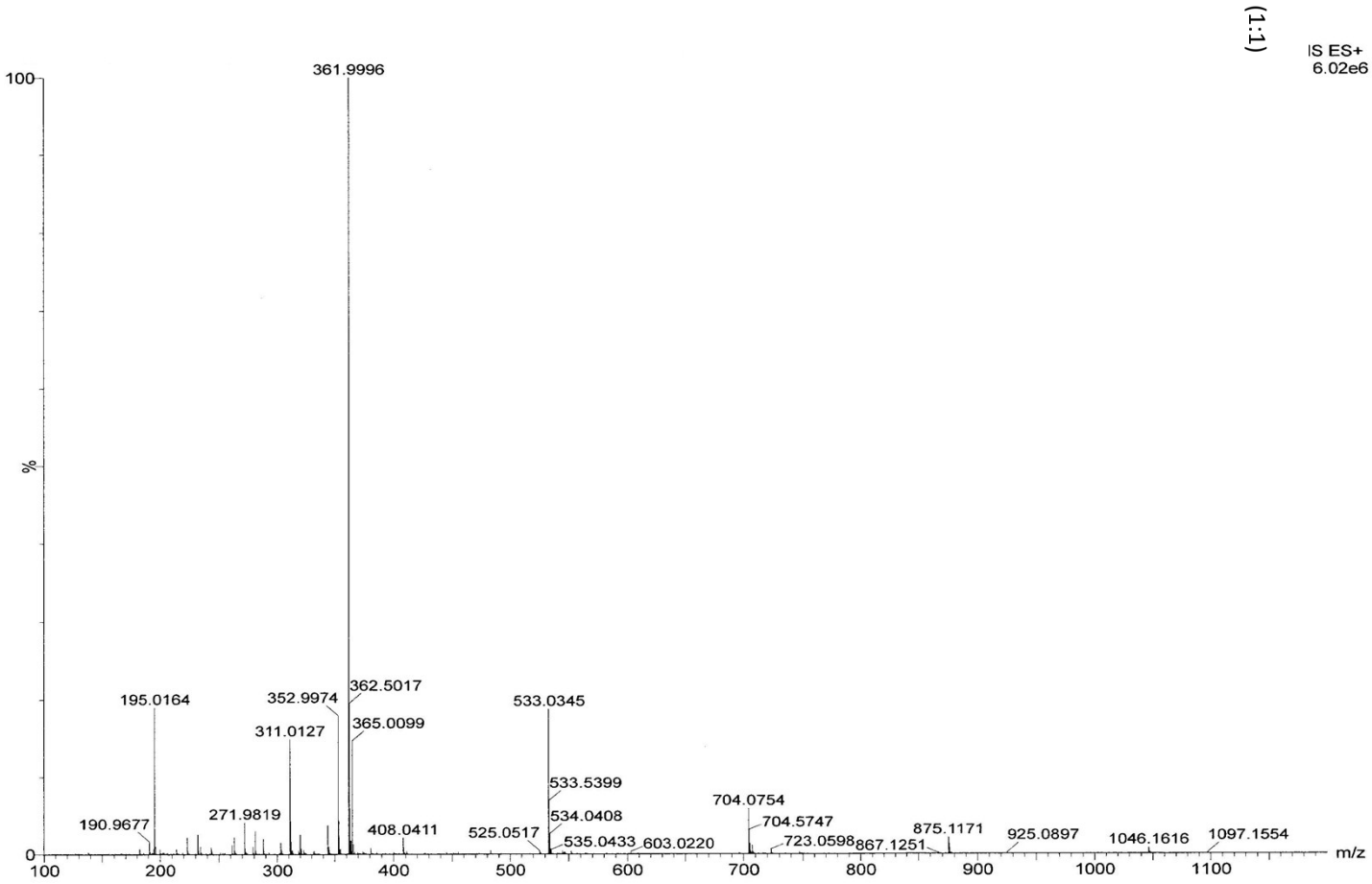


Figure S20: ^{1}H NMR spectral study of inter molecular interactions (a) caffeine (b) cholecalciferol (c) caffeine+ cholecalciferol

c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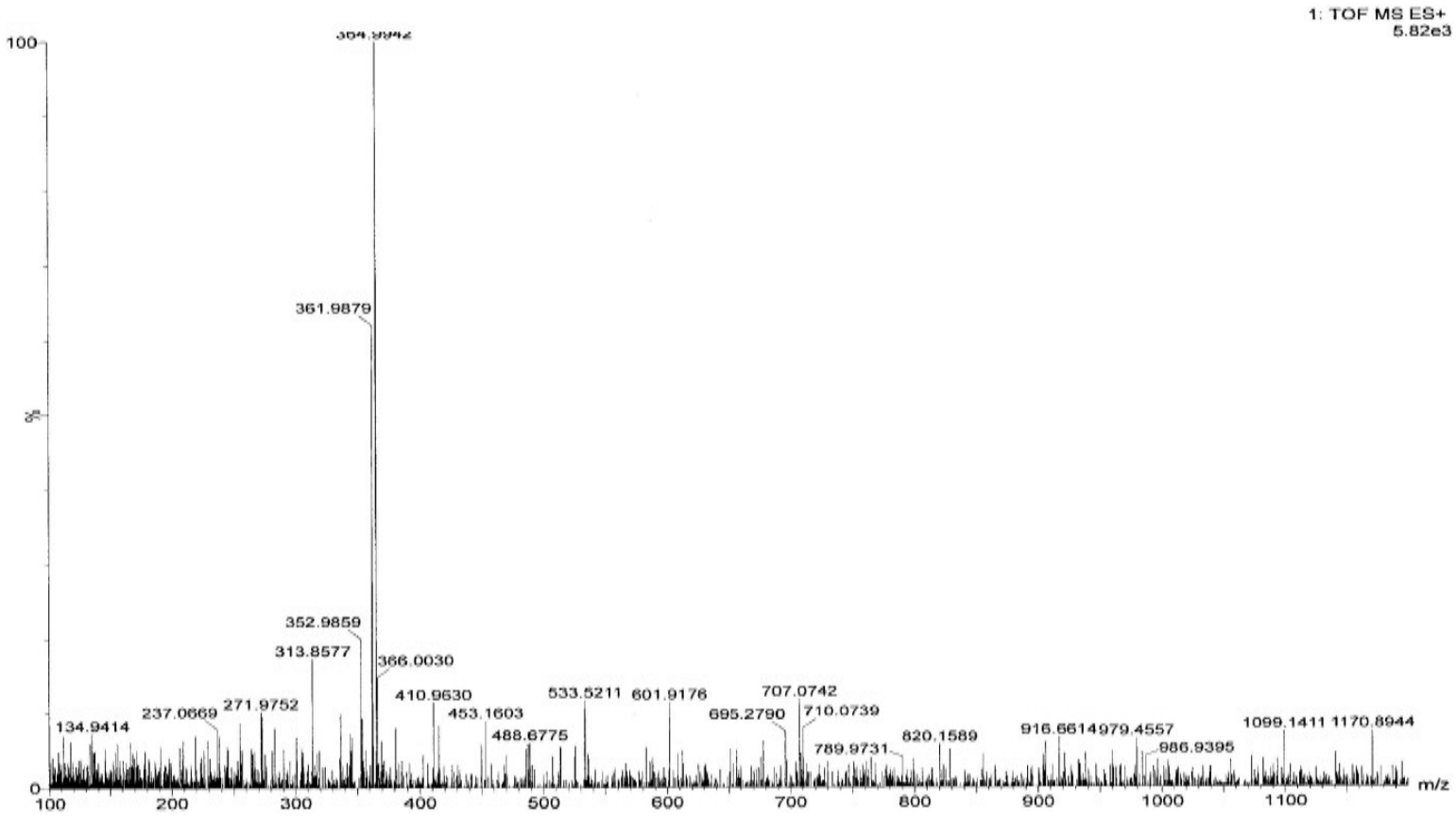
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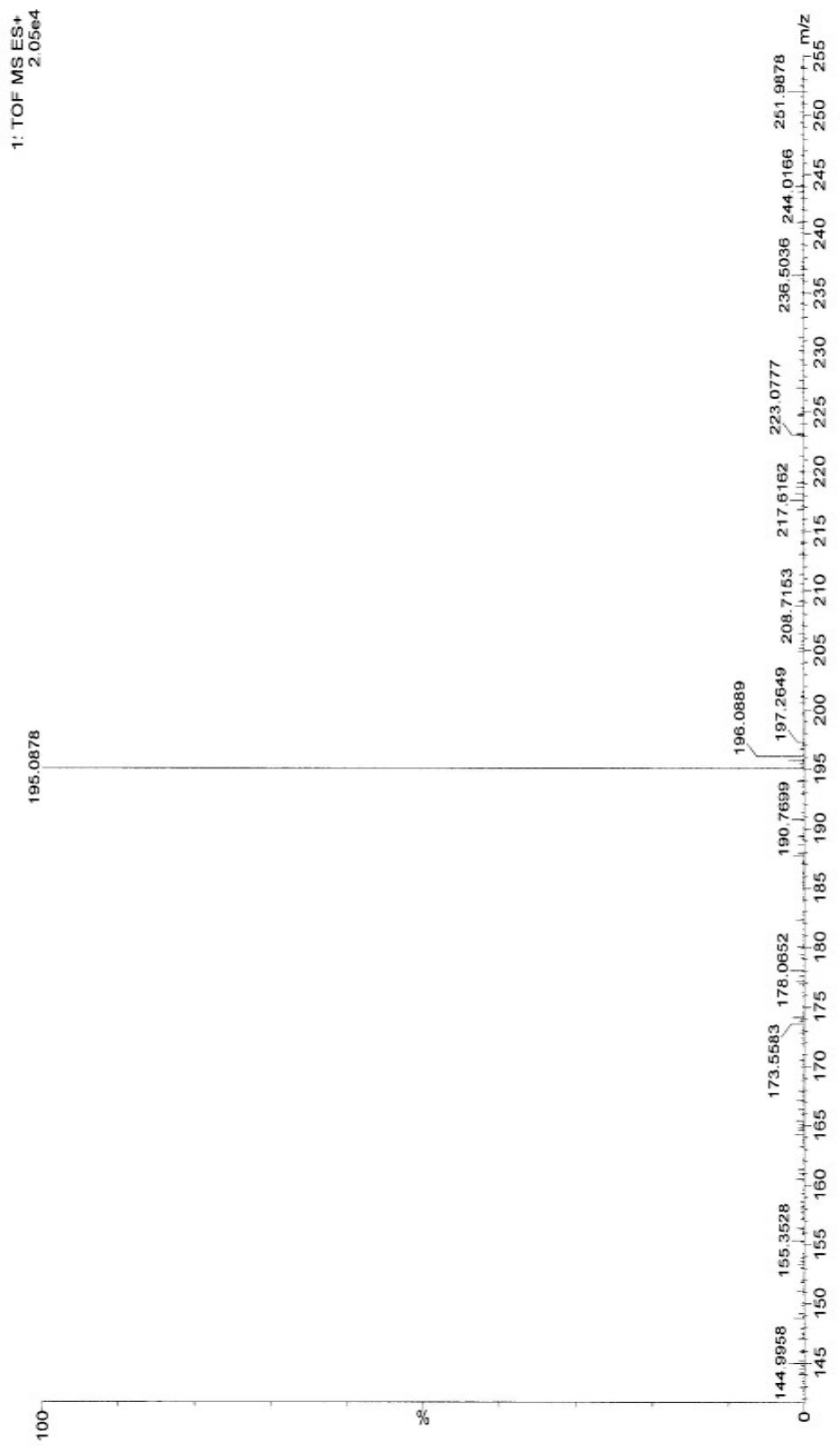

Figure S21: ESI MS study of inter molecular interactions (a) caffeine (b) cholecalciferol (c) caffeine+ cholecalciferol