Unifying *Candida antarctica* Lipase B and nZVI in bioinspired polymer nanomicelles: A nanobiohybrid synergy for sustainable synthesis of acetaminophen

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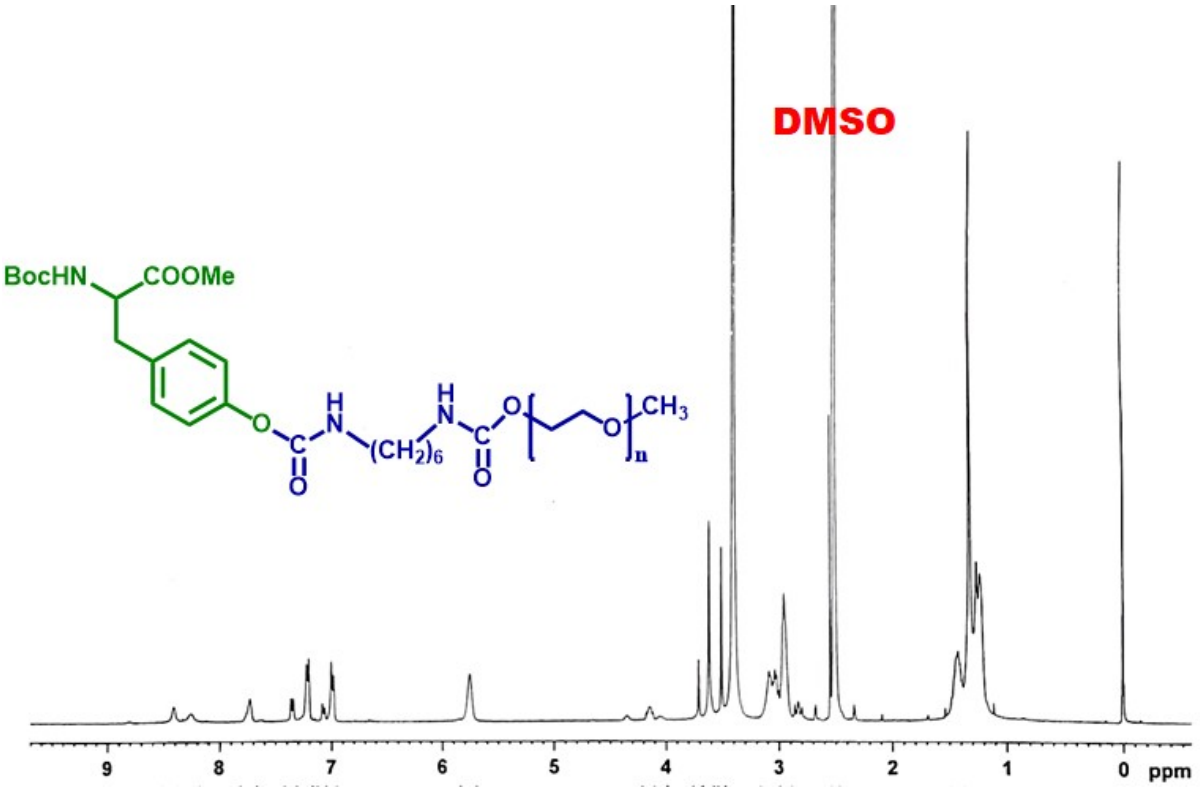

Figure S1: ^{1}H NMR of pre-polymer 1

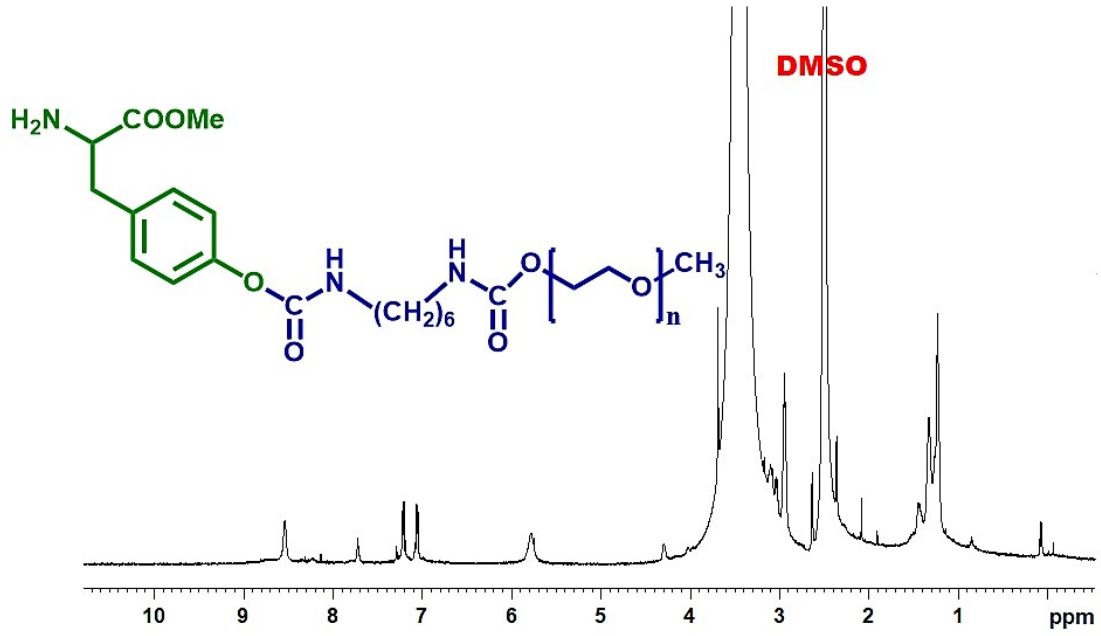

Figure S2: ^{1}H NMR of pre-polymer 2

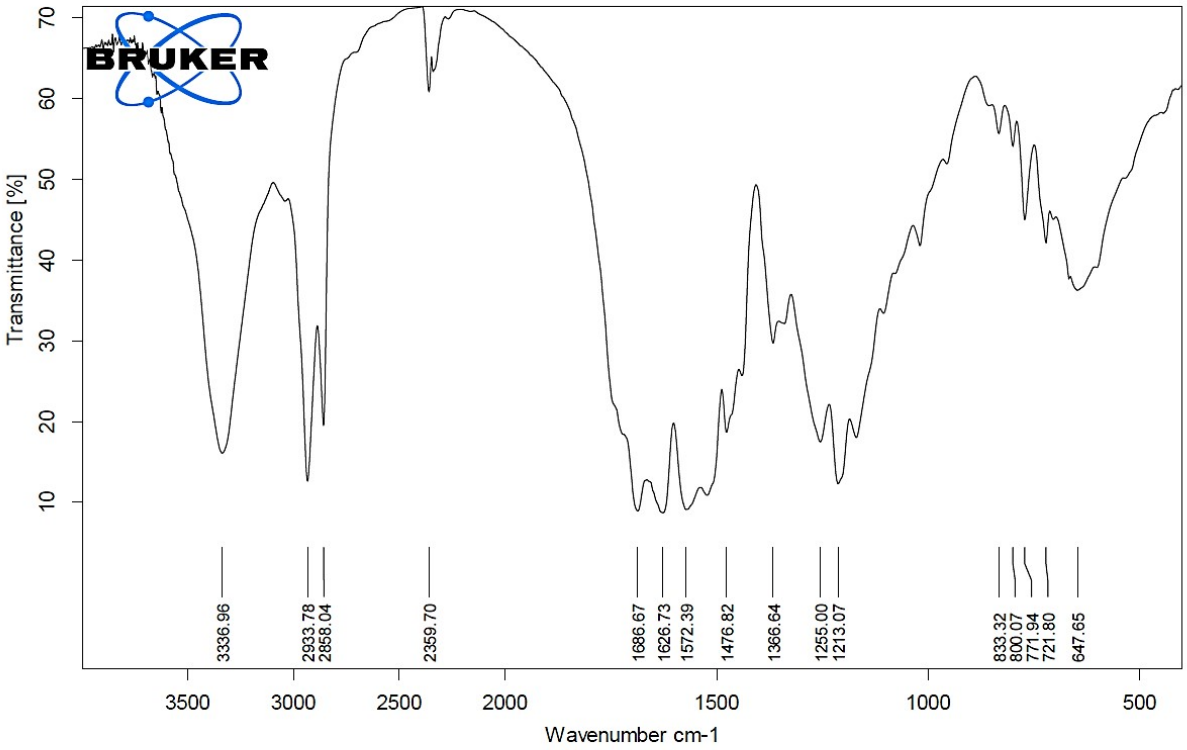

Figure S3: FTIR spectrum of Pre-polymer 1

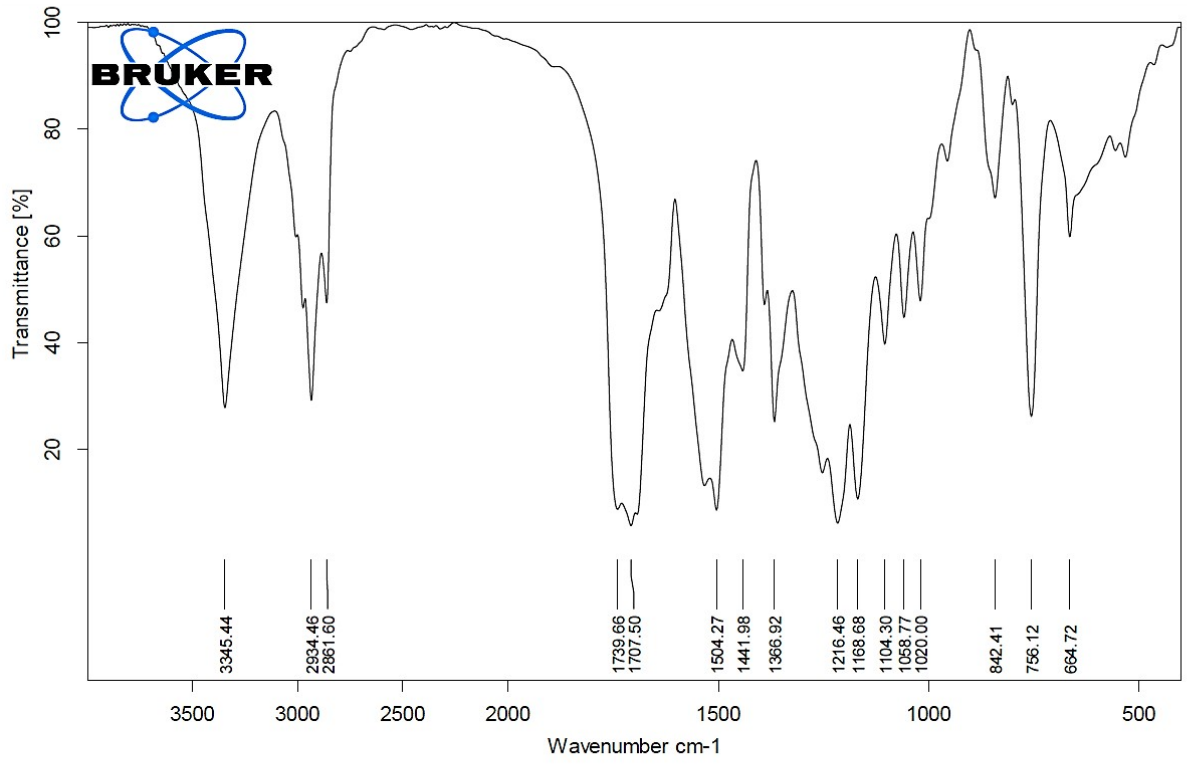

Figure S4: FTIR spectrum of Pre-polymer 2

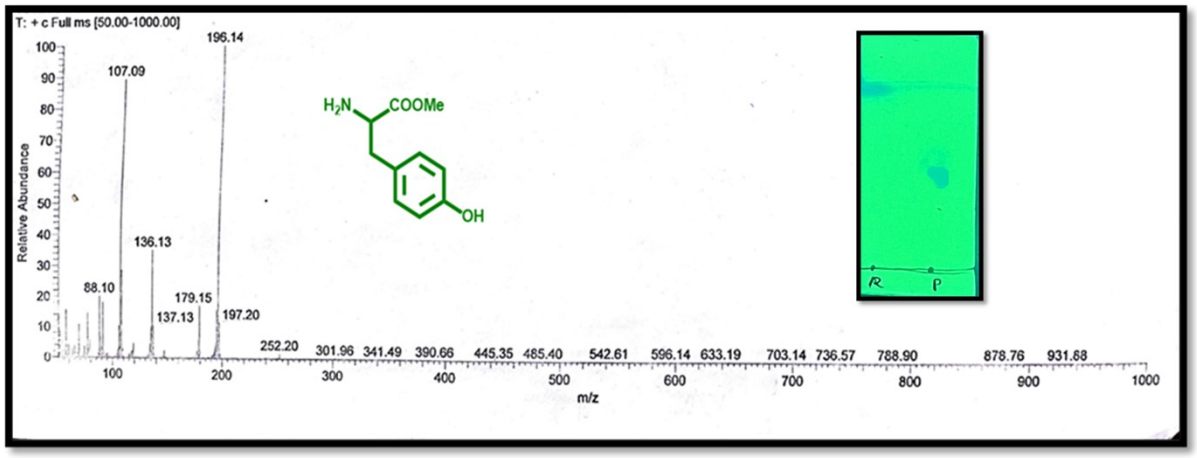

Figure S5: Mass spectrum of L-Tyrosine methyl ester (**Inset:** TLC plate showing the successful deprotection of Boc group under given reaction conditions; Spot 1(R): Boc-L-tyrosine methyl ester and Spot 2(P) L-Tyrosine methyl ester))

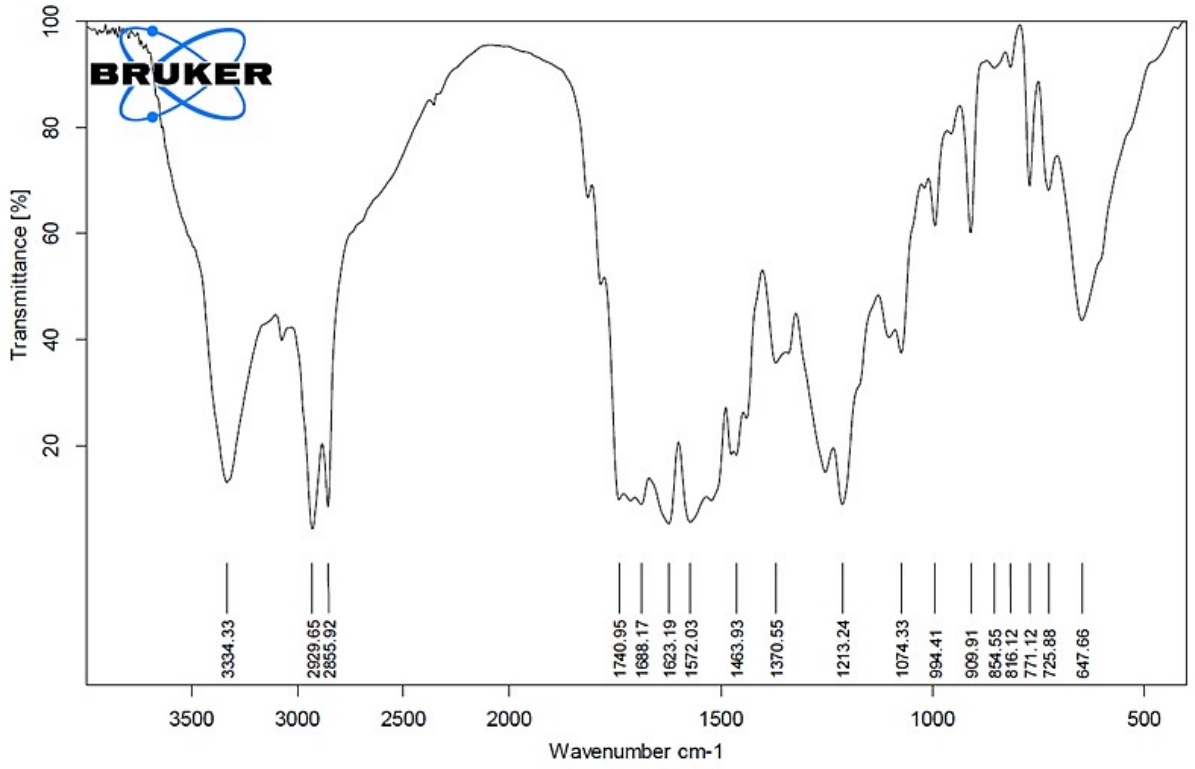

Figure S6: FTIR spectrum of Pre-polymer 3

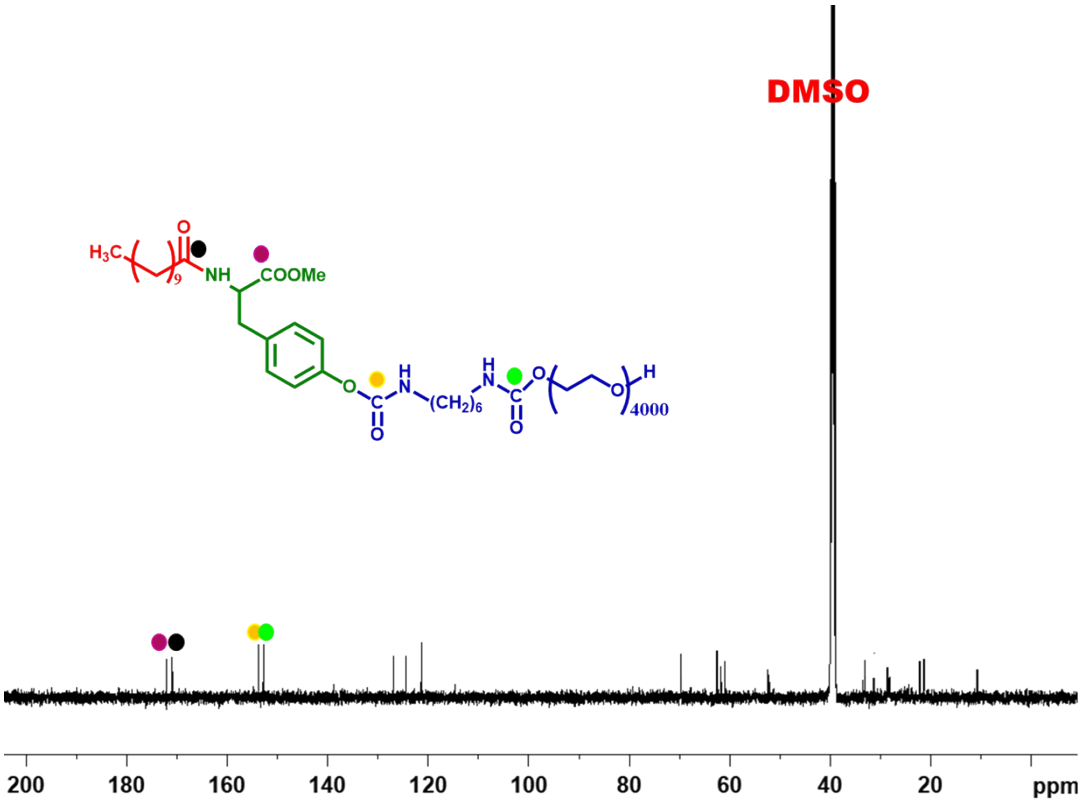

Figure S7: ^{13}C NMR of final amphiphilic polymer

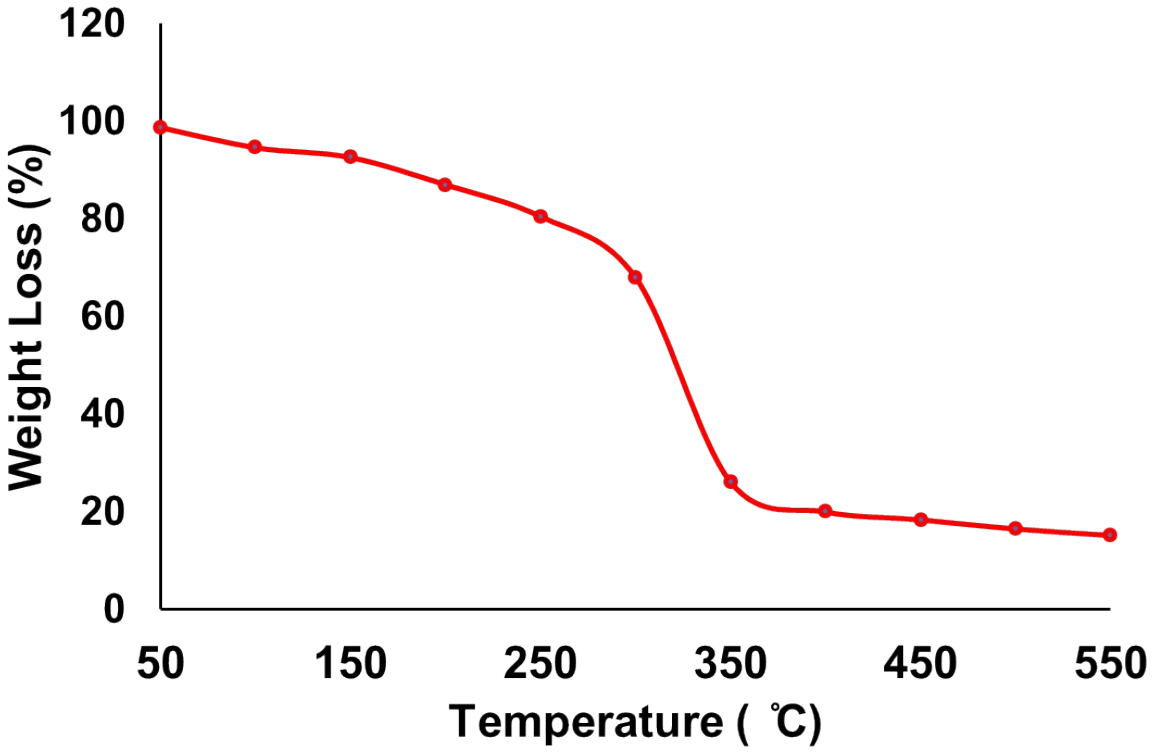

Figure S8: TGA profile of final amphiphilic polymer

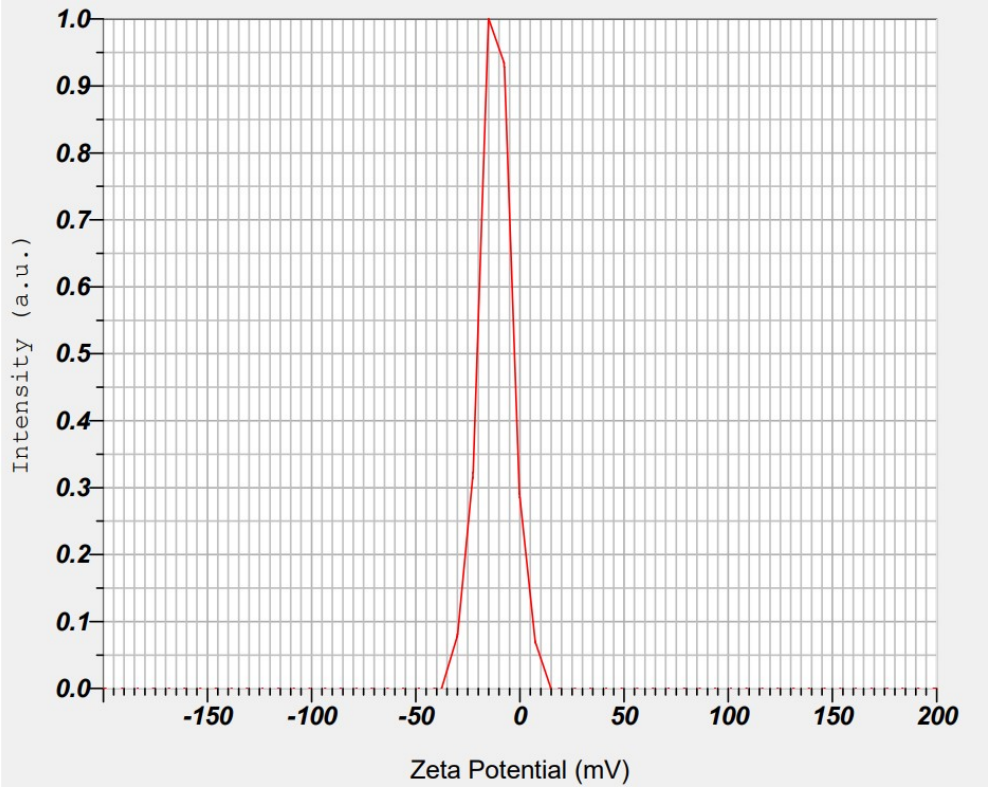

Figure S9: Zeta potential of nanomicelles solution after loading CALB enzyme

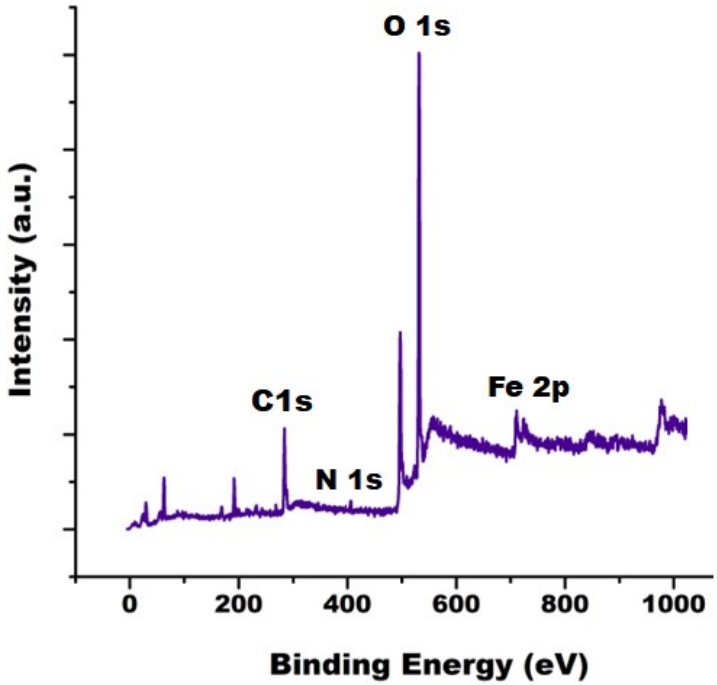

Figure S10: Full scan XPS spectrum of nanoreactors (solution was dried into powder form).

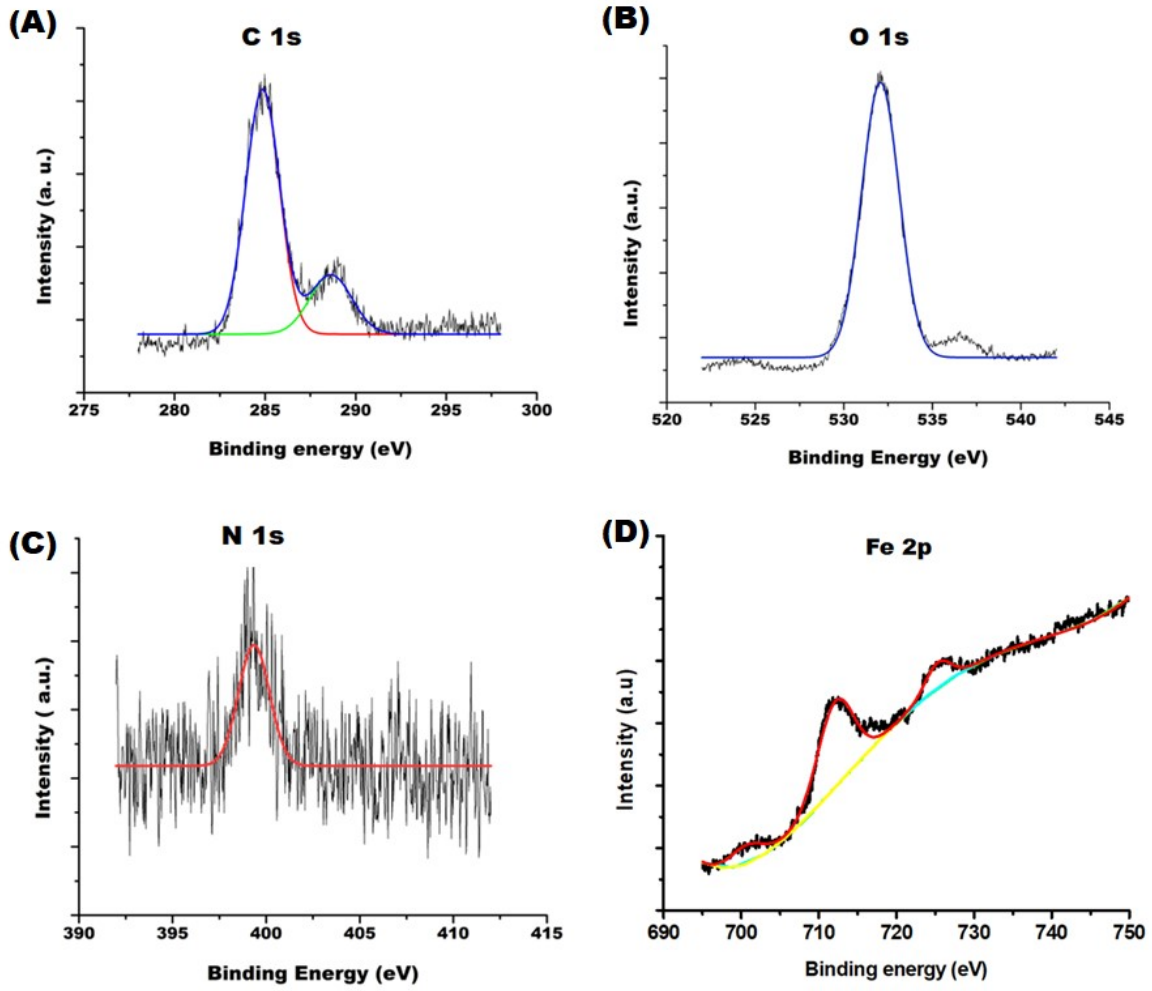

Figure S11: Deconvulated spectra of enzyme nanoreactor (A) C 1s (B) O 1s (C) N 1s and (D) Fe 2p.

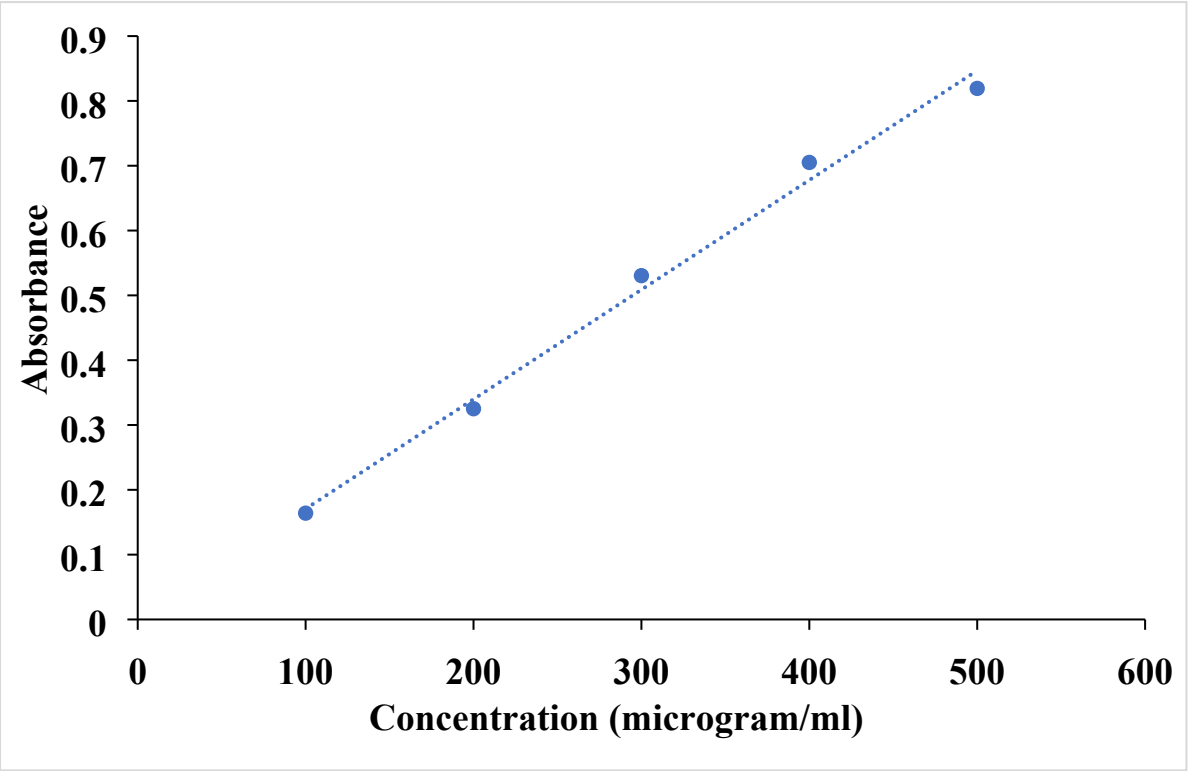

Figure S12: Calibration plot of BSA

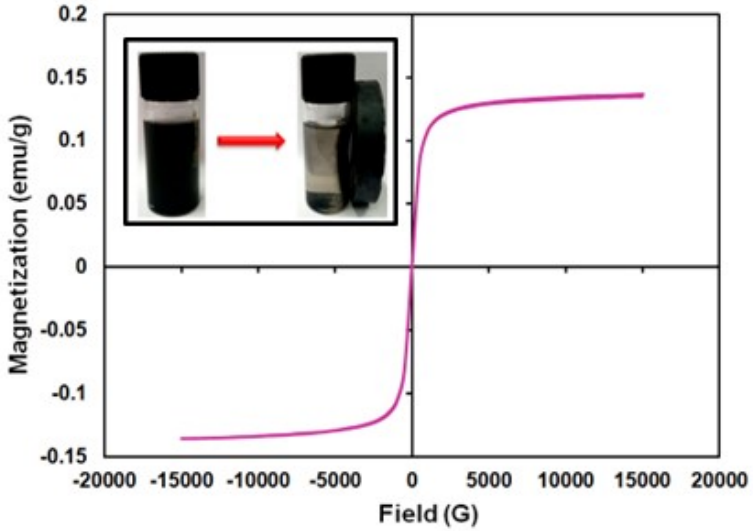

Figure S13: Evaluation of magnetic property via room-temperature magnetization curve

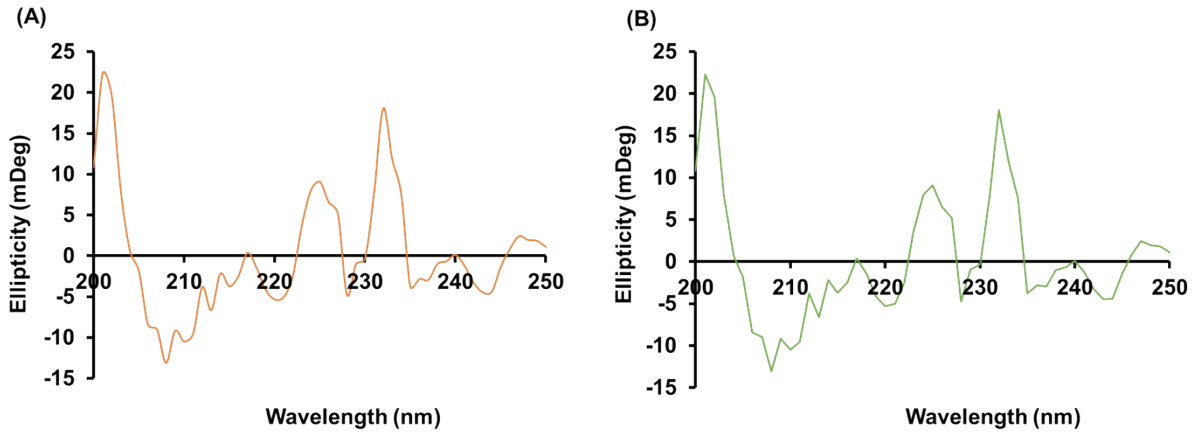

Figure S14: Circular Dichroism spectra of (A) Free CALB and (b) nZVI-CALB@NM.

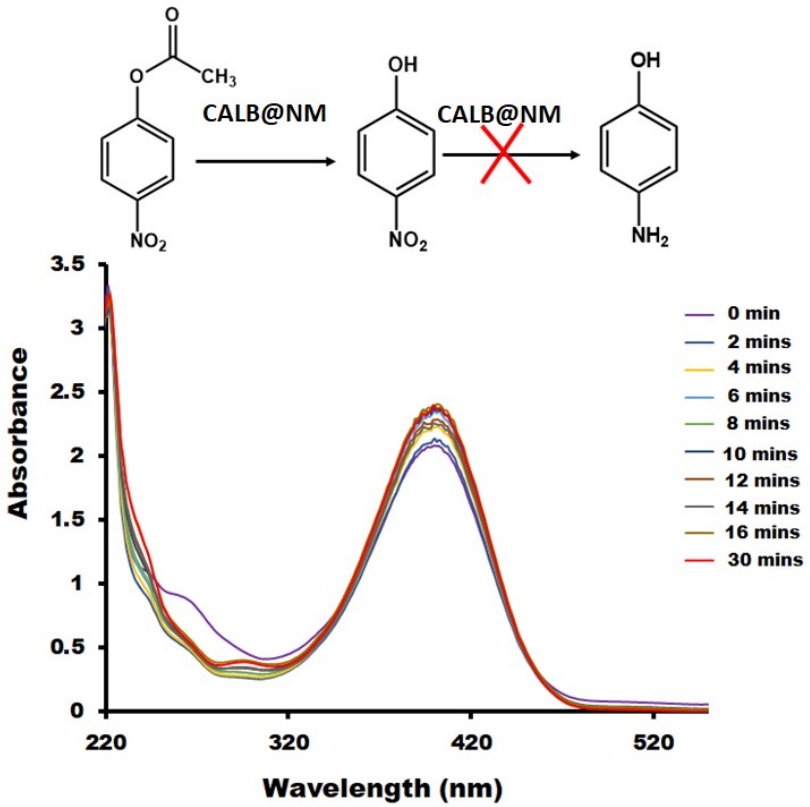

Figure S15: UV-Visible spectrum showing the 4-NP formation from 4-NPA in presence of CALB and formation of 4-AP does not occur in absence of nZVI nanoparticles.

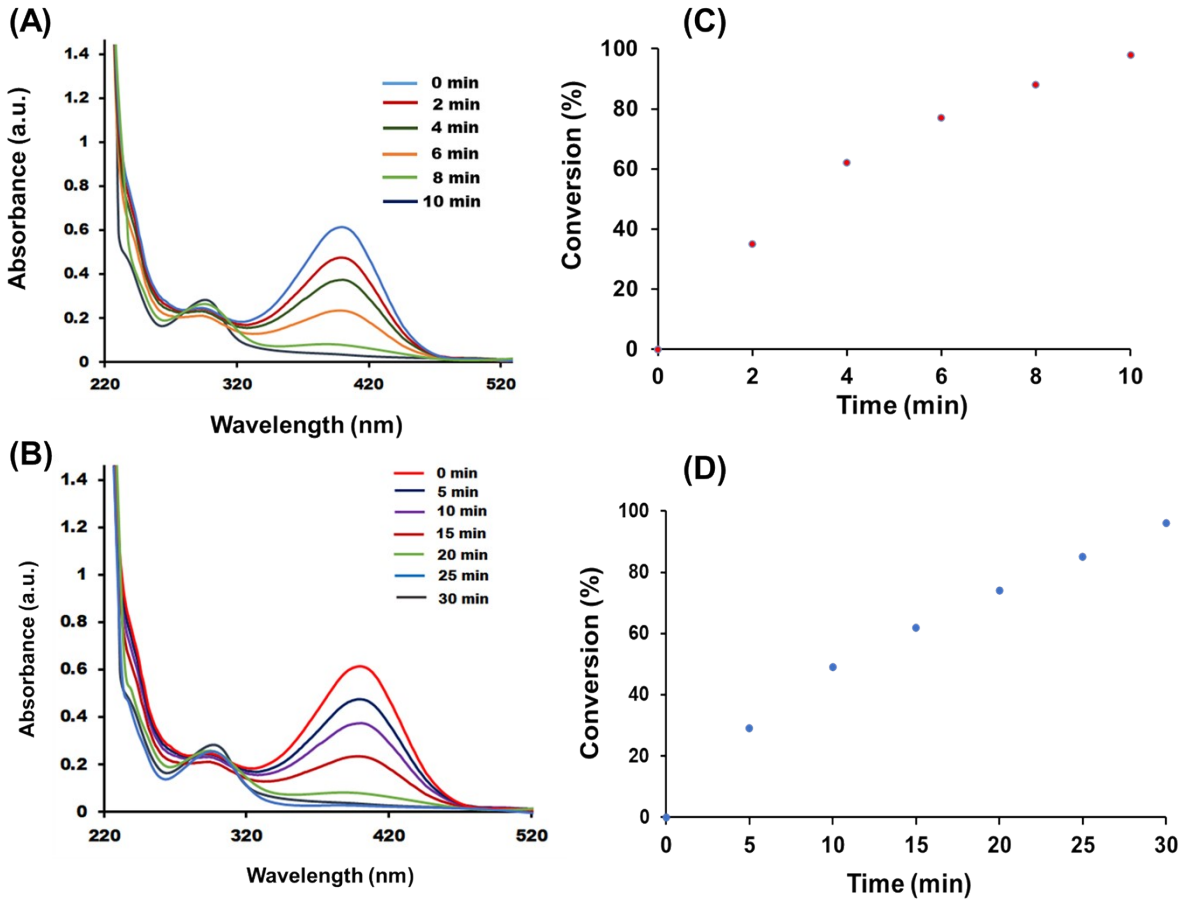

Figure S16: The time dependent UV–visible absorption spectra of 4-NP reduction step and conversion % in presence of nanomicelles (A, C) and in absence of nanomicelles (B, D) at 35 ℃.

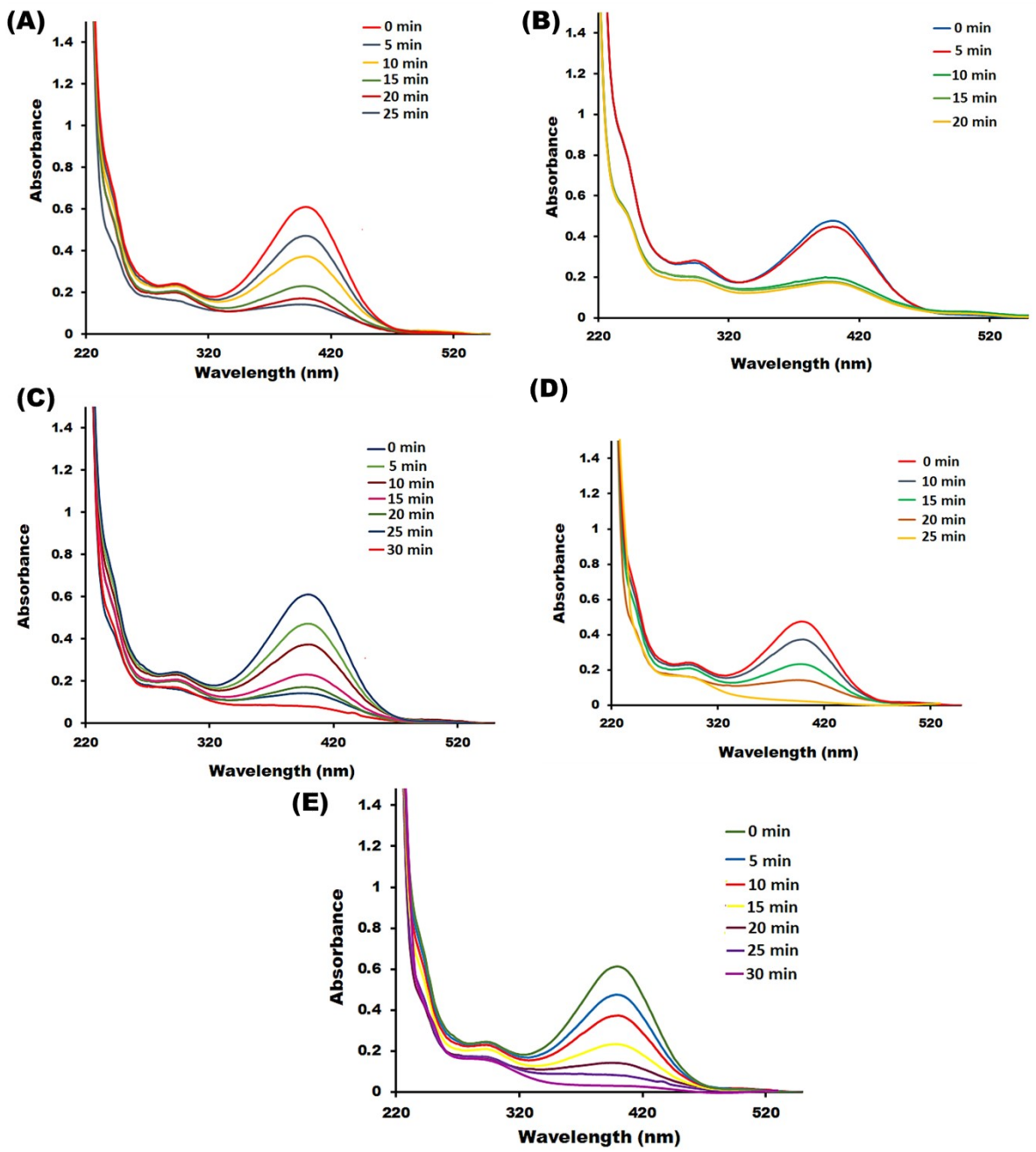

Figure S17: The time dependent UV–vis absorption spectra of 4-NP reduction step and the dependence of ln(C/Co) versus time plot for the pseudo-first-order reaction kinetics in the presence of nZVI-CALB@NM at 35 C. UV-visible spectra of (A) p-nitrophenyl butyrate, (B) p-nitrophenyl chloroformate (C) p-nitrophenyl decanoate, (D) p-nitrophenyl octanoate and (E) p-nitrophenyl palmitate.

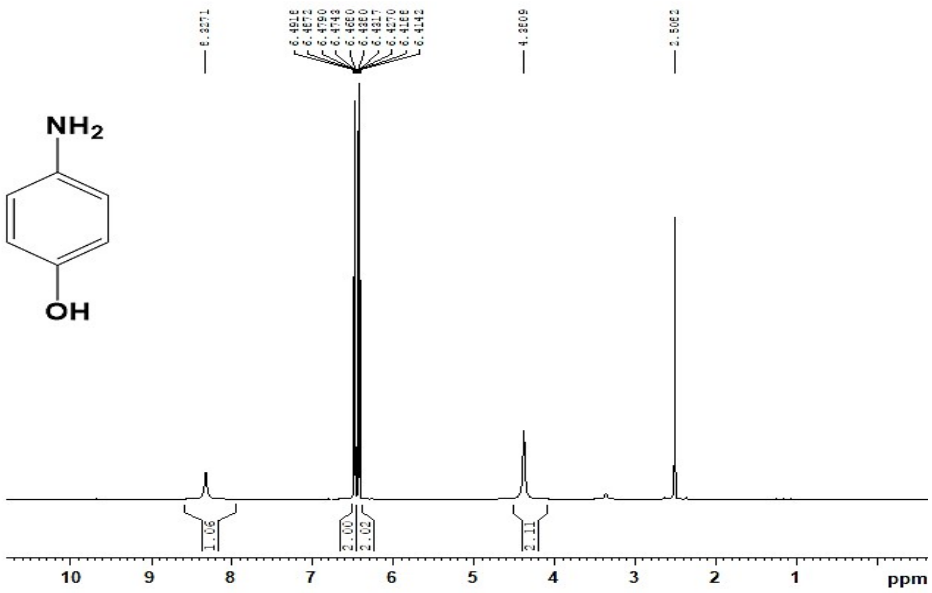

Figure S18: ^{1}H NMR of p-aminophenol

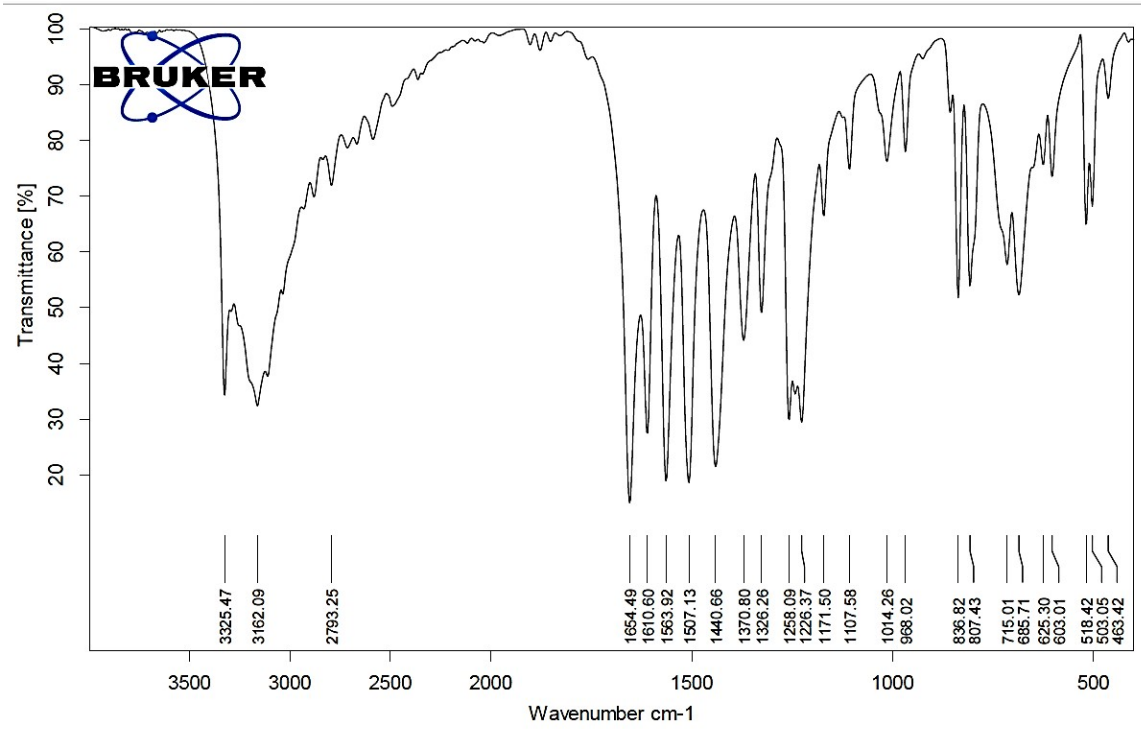

Figure S19: FTIR of p-acetaminophen

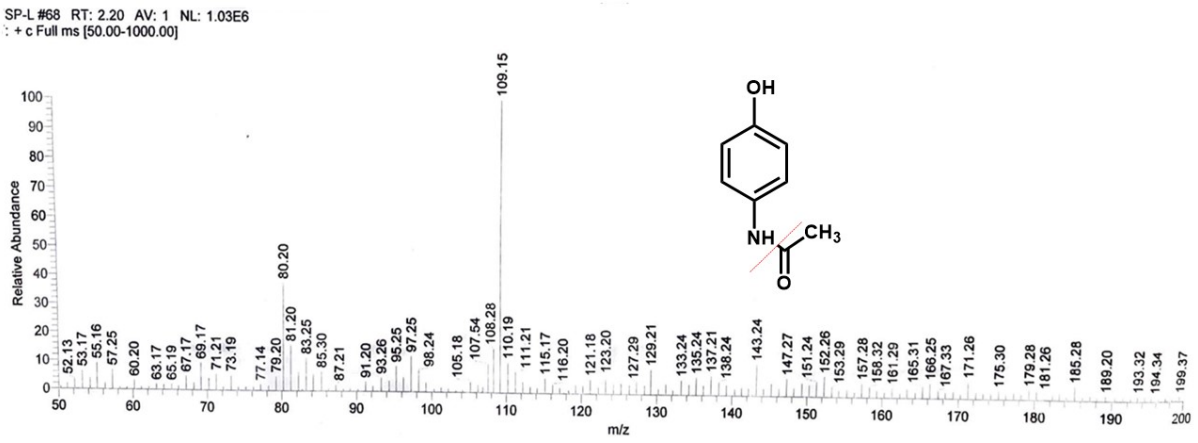

Figure S20: Mass analysis (DIP Mode) of p-acetaminophen

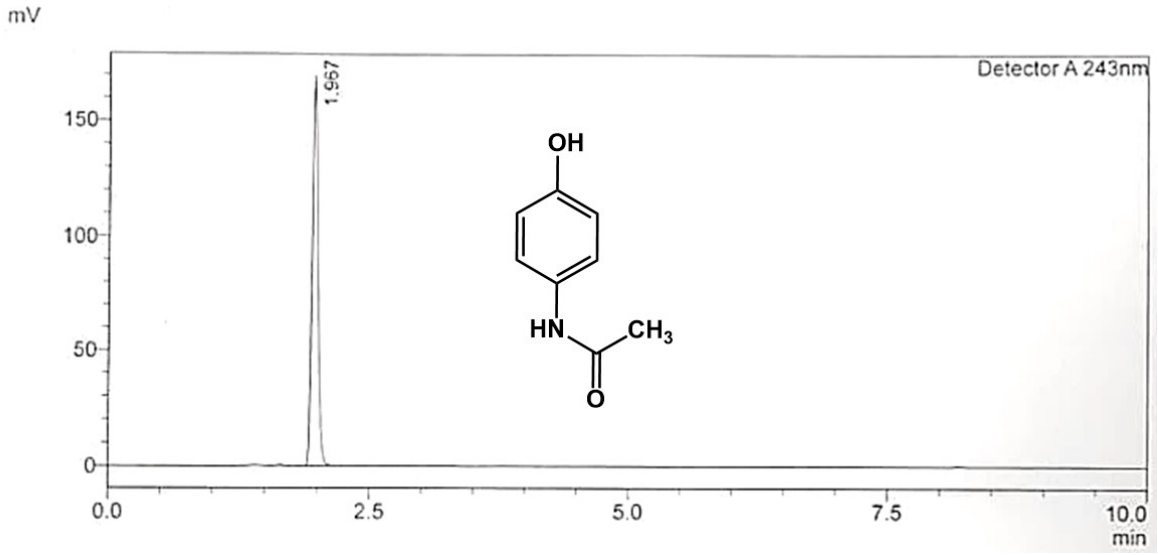

Figure S21: HPLC data of standard p-acetaminophen