pharmaceutics

Supplementary Materials: Choline-Amino Acid Ionic Liquids as Green Functional Excipients to Enhance Drug Solubility

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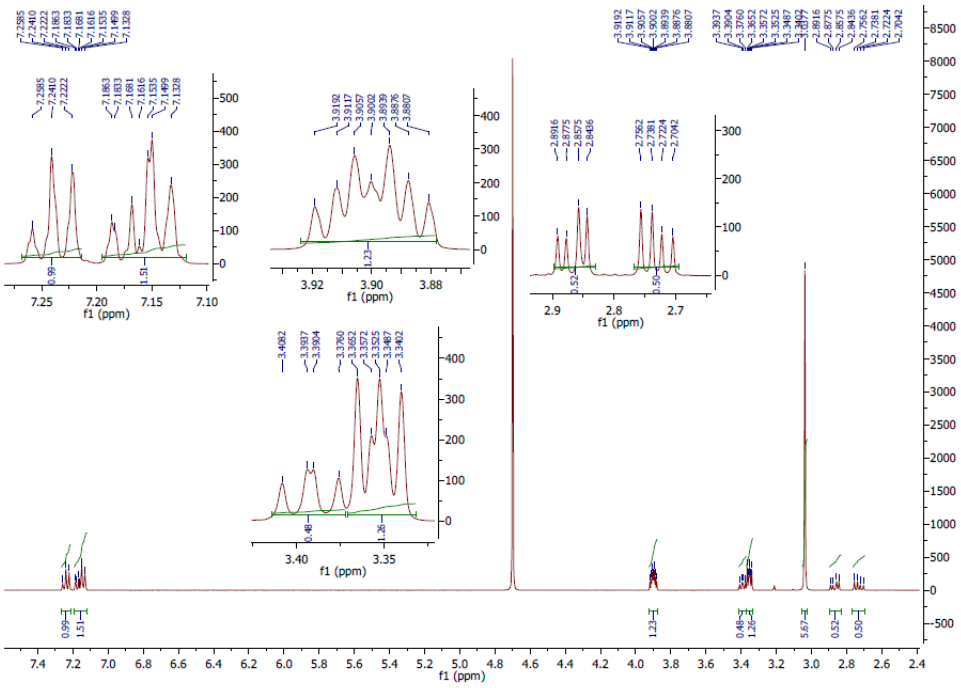
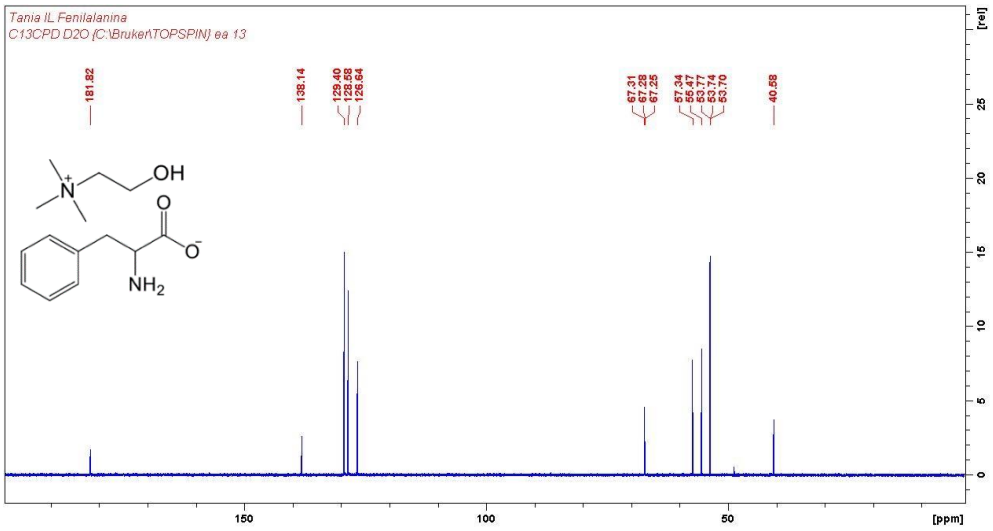
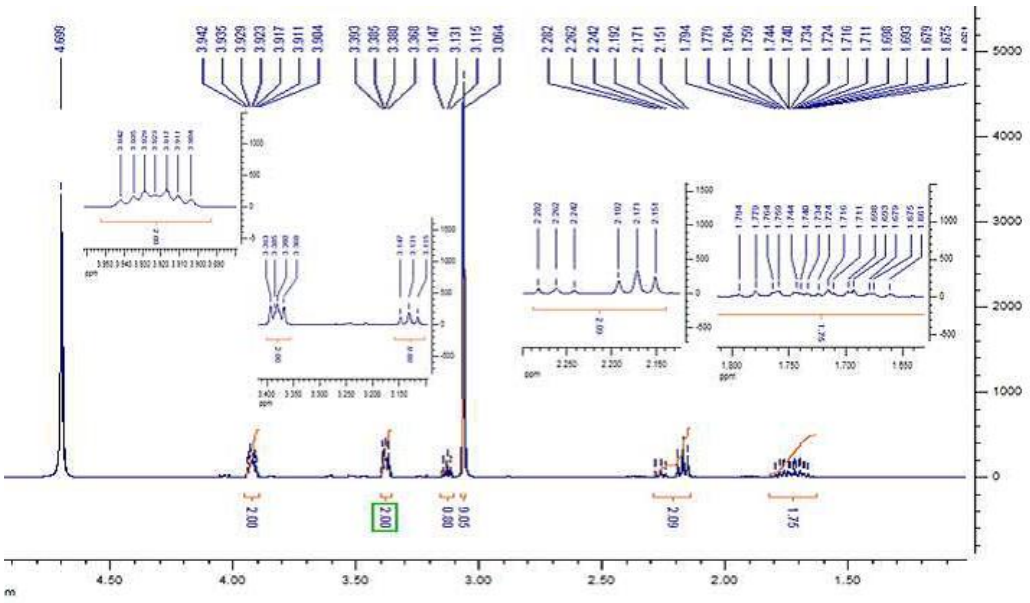


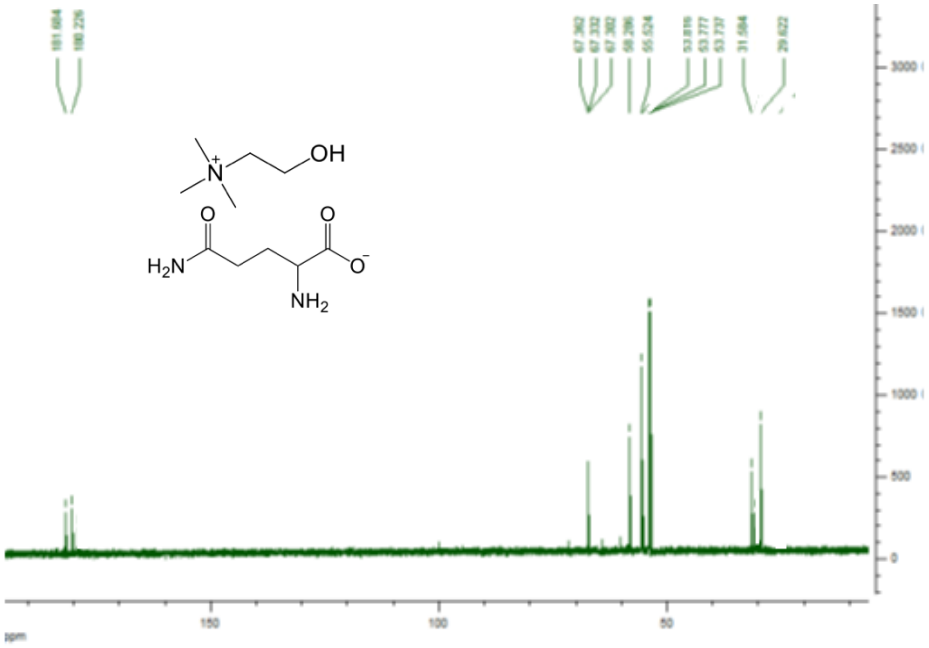
a). ^{1}HNMR (D_2O) (δ ppm, mult, $J_{H\text{-}H/Hz}$) [Cho][Phe]: 3.04 (s, CH_3, **N-CH_3**), 3.35 (t, 5.1, CH_2, **H-2,**), 3.90 (m, CH_2, **H-3**), 3.39 (dd, J_1= 5.8, J_2=4.76, CH, **H-2'**), 2.87 (dd, J_1= 5.64, J_2=5.56, CH_2, **H-3'**), 2.73 (dd, J_1= 7.24, J_2=7.28, CH_2, **H-4'**), 7.16 (m, $CH_{aromatic\ rimg}$, **H-2'',3'',5'',6''**), 7.24 (t,7.5, $CH_{aromatic\ ring}$, **H-4''**).



b). ^{13}C NMR (D_2O) [Cho] [Phe] (δ ppm): 181,8 (COO^-, C1'), 138,14 (C, C1''), 129,40 (CH, C2'', C6''), 128,58 (CH, C3'', C5''), 126,64 (CH, C4''), 67,28 (CH2, C2), 57.34 (CH, C2'), 55.47 (CH_2, C3), 53.77, 53.74, 53.70 (CH_3, C1), 40.58 (CH_2, C3').



c). ^{1}HNMR (D_2O)[Cho][Glu] (δ ppm, mult, $J_{H-H/Hz}$): 3.04 (s, CH_3,**N-CH_3),** 3.38 (m, CH_2, **H-2**), 3.92 (m, CH_2, **H-3**), 3.13 (t, 6.3, CH, **H-2'**),1.73 (m, CH_2,**H-3'**), 2.17, 2.26(dt, J=8.17,CH_2, **H-4'**).



d). ^{13}C NMR (D_2O) [Cho][Glu] (δ ppm): 181.6 ($CONH_2$, C5'), 180.2 (COO^-, C1'), 67.33 (CH_2, C2), 58.29 (CH, C2'),55.52 (CH_2, C3), 53.82, 53.78, 53.74 (CH_3, C1), 31.58 (CH_2, C3'), 29.62 (CH_2, C4').

Figure S1: NMR data and structure of the choline-based ionic liquids: **a)** ^{1}H-NMR of [Cho][Phe]; **b)** ^{13}C-NMR of [Cho][Phe]; **c)** ^{1}H-NMR of [Cho][Glu]; **d)** ^{13}C-NMR of [Cho][Glu].