Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Electronic Supplementary Information

Note added after first publication: This file replaces the version published on 18th of September 2017, in which the figures were not accurately reproduced. The content of the file has not otherwise changed.

Double Salt Ionic Liquids Based on 1-Ethyl-3-Methylimidazolium Acetate and Hydroxyl-Functionalized Ammonium Acetates: Strong Effects of Weak Interactions

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Supplementary Figures

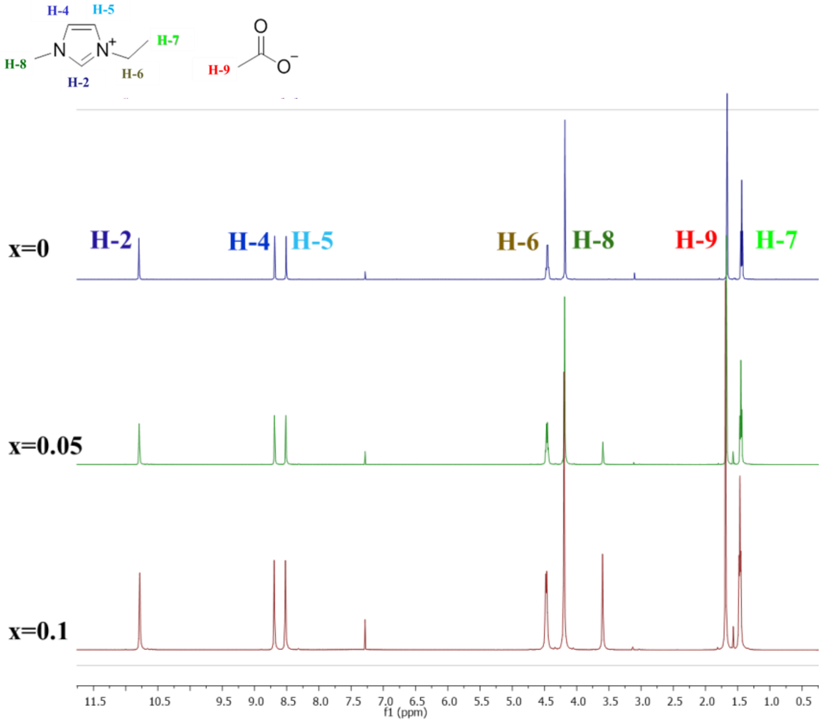

Figure S1. [1]H NMR spectra of $[N(CH_3)_4]_x[C_2mim]_{1-x}[OAc]$ at 25 ºC using $CDCl_3$ as external lock (x corresponds to the molar ratio of $[N(CH_3)_4]^+/[OAc]^-$, in which zero corresponds to $[C_2mim][OAc]$).

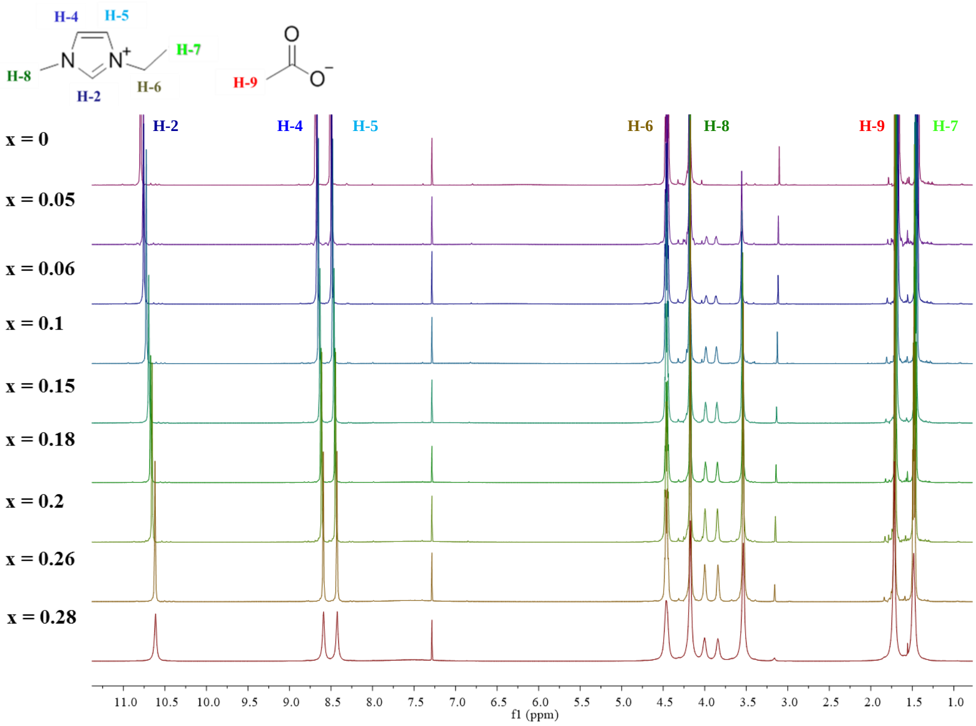

Figure S2. [1]H NMR spectra of $[Ch]_x[C_2mim]_{1-x}[OAc]$ at 25 ºC using $CDCl_3$ as external lock (x corresponds to the molar ratio of $[Ch]^+/[OAc]^-$, in which zero corresponds to $[C_2mim][OAc]$).

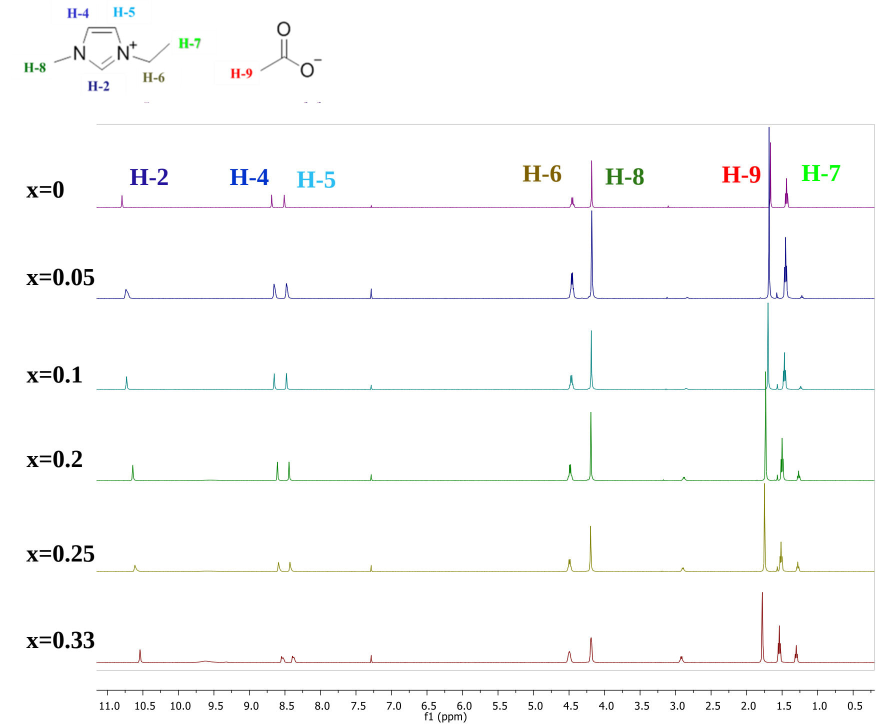

Figure S3. [1]H NMR spectra of $[NH_3CH_2CH_3]_x[C_2mim]_{1-x}[OAc]$ at 25 ºC using $CDCl_3$ as external lock (x corresponds to the molar ratio of $[NH_3CH_2CH_3]^+/[OAc]^-$, in which zero corresponds to $[C_2mim][OAc]$).

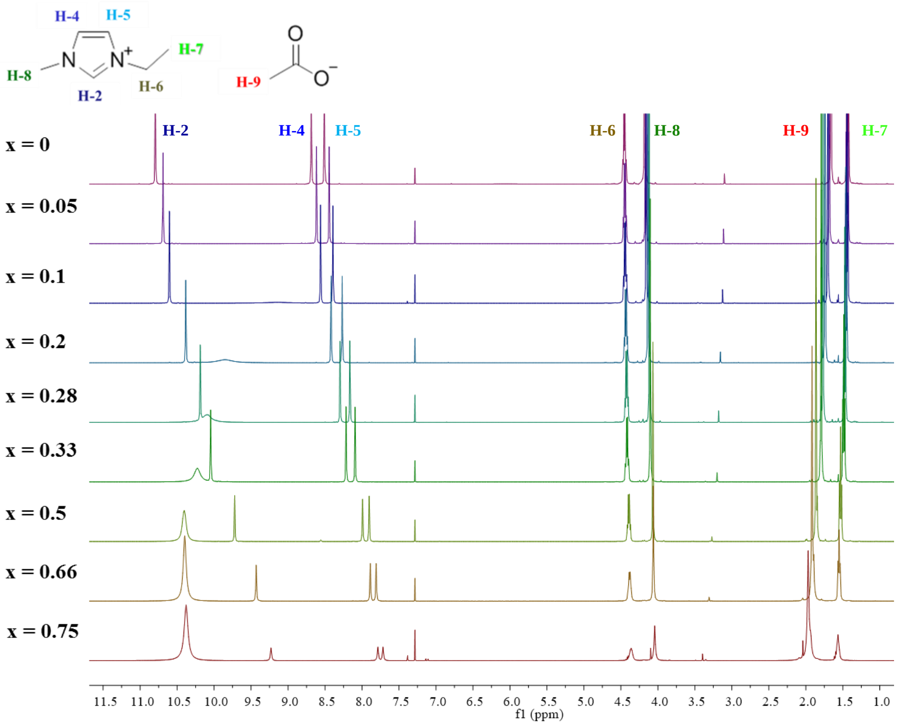

Figure S4. [1]H NMR spectra of $[NH_3OH]_x[C_2mim]_{1-x}[OAc]$ at 25 ºC using $CDCl_3$ as external lock (x corresponds to the molar ratio of $[NH_3OH]^+/[OAc]^-$, in which zero corresponds to $[C_2mim][OAc]$).

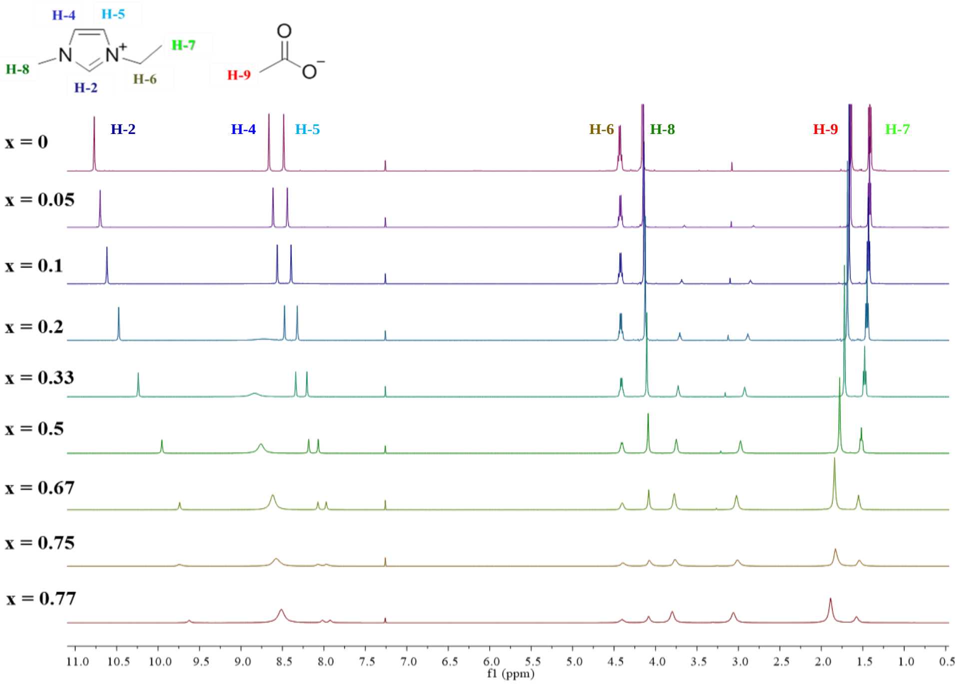

Figure S5. [1]H NMR spectra of $[NH_3(CH_2)_2OH]_x[C_2mim]_{1-x}[OAc]$ at 25 ºC using $CDCl_3$ as external lock (x corresponds to the molar ratio of $[NH_3(CH_2)_2OH]^+/[OAc]^-$), in which zero corresponds to $[C_2mim][OAc]$).

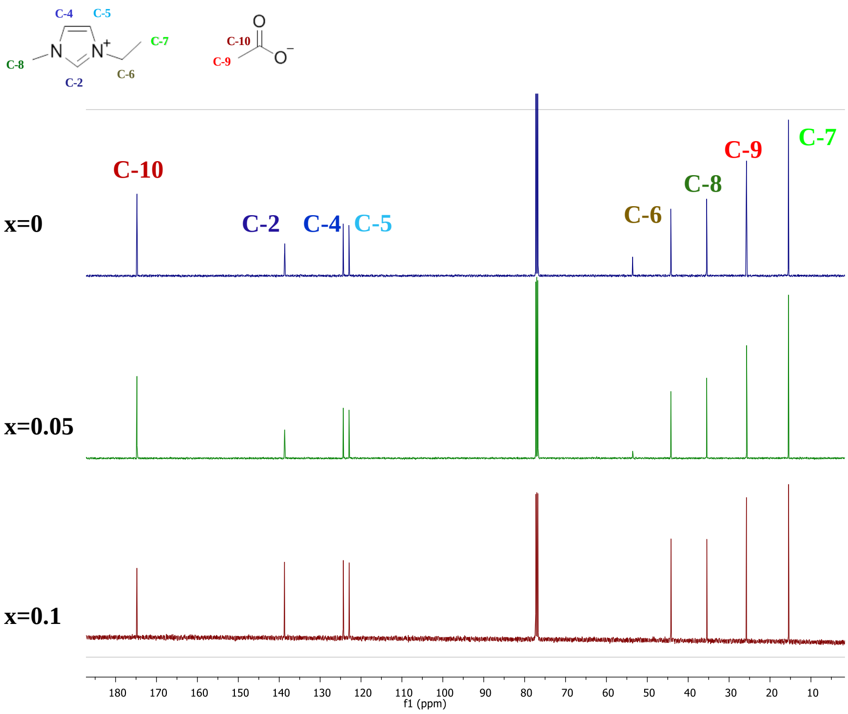

Figure S6. [13]C NMR spectra of $[N(CH_3)_4]_x[C_2mim]_{1-x}[OAc]$ at 25 ºC using $CDCl_3$ as external lock (x corresponds to the molar ratio of $[N(CH_3)_4]^+/[OAc]^-$, in which zero corresponds to $[C_2mim][OAc]$).

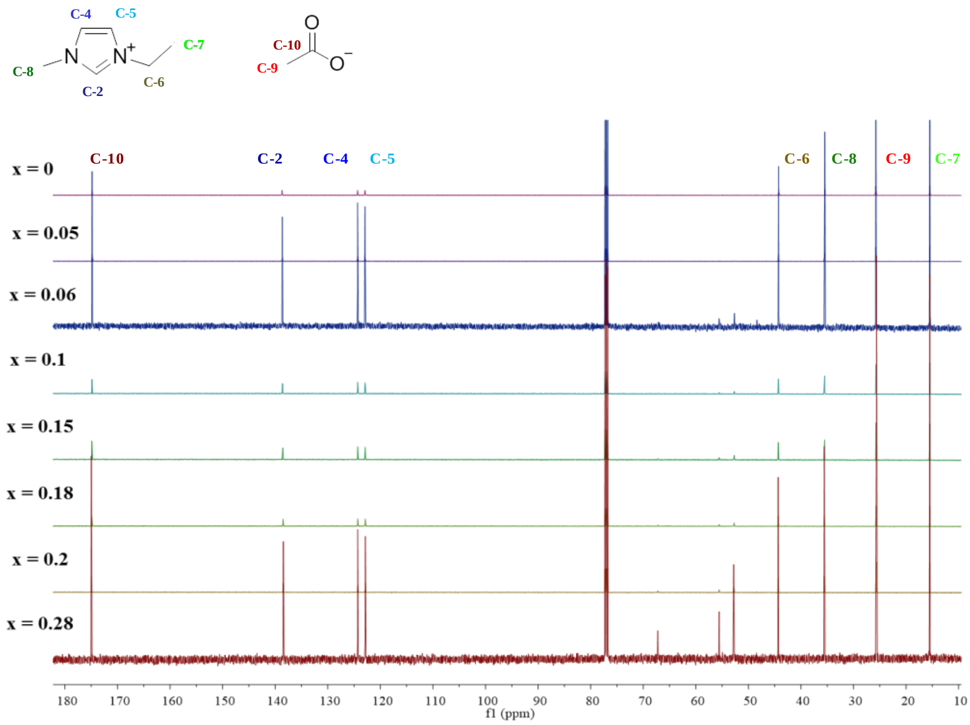

Figure S7. ^{13}C NMR spectra of $[Ch]_x[C_2mim]_{1-x}[OAc]$ at 25 ºC using $CDCl_3$ as external lock (x corresponds to the molar ratio of $[Ch]^+/[OAc]^-$, in which zero corresponds to $[C_2mim][OAc]$).

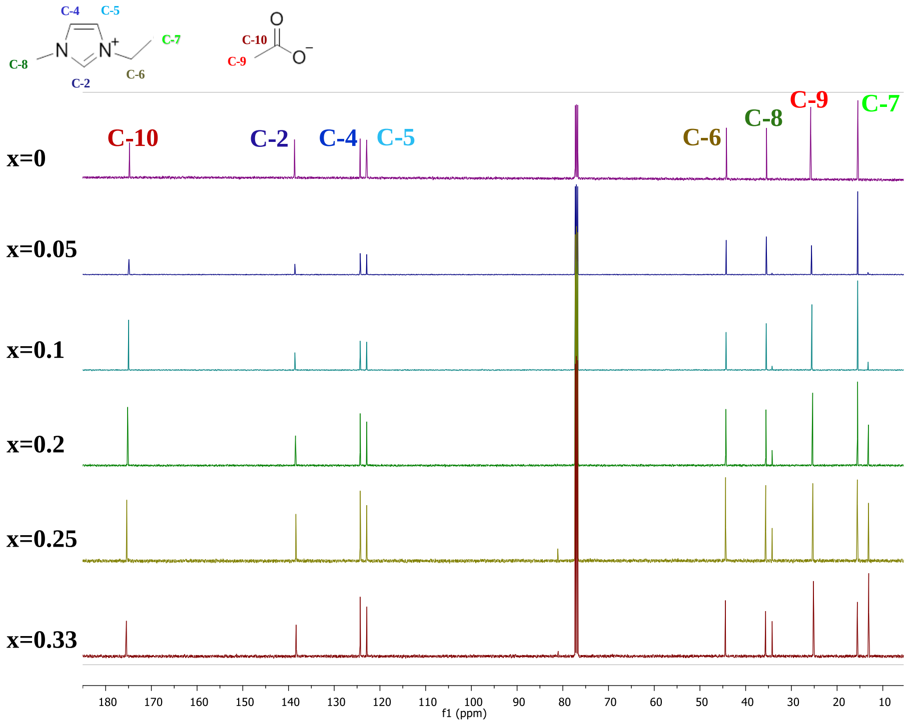

Figure S8. ^{13}C NMR spectra of $[NH_3CH_2CH_3]_x[C_2mim]_{1-x}[OAc]$ at 25 ºC using $CDCl_3$ as external lock (x corresponds to the molar ratio of $[NH_3CH_2CH_3]^+/[OAc]^-$, in which zero corresponds to $[C_2mim][OAc]$).

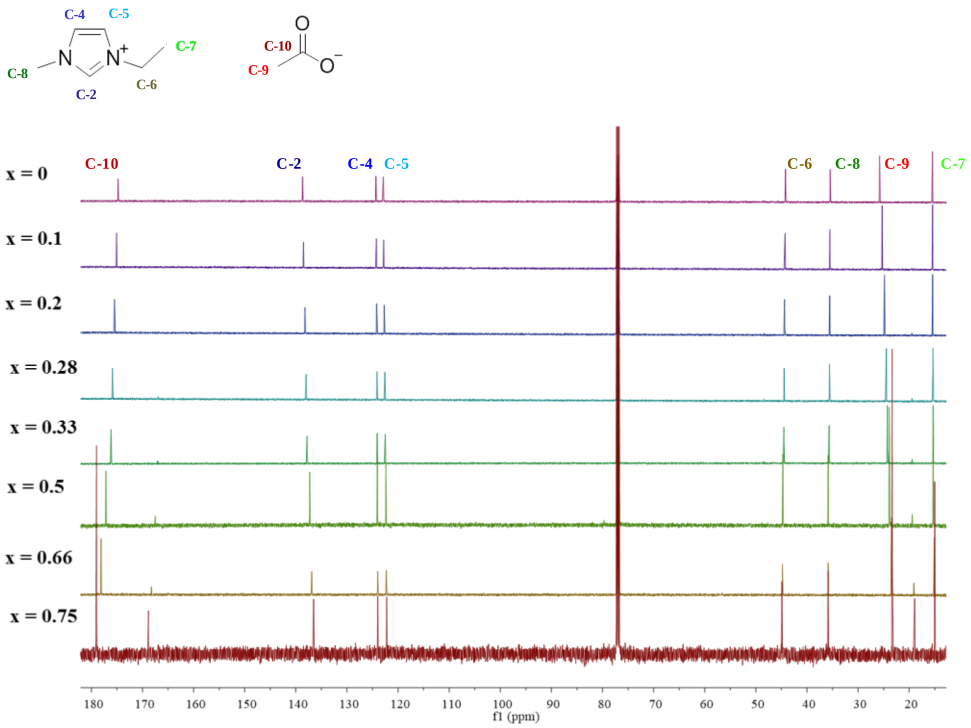

Figure S9. ^{13}C NMR spectra of $[NH_3OH]_x[C_2mim]_{1-x}[OAc]$ at 25 ºC using $CDCl_3$ as external lock (x corresponds to the molar ratio of $[NH_3OH]^+/[OAc]^-$, in which zero corresponds to $[C_2mim][OAc]$).

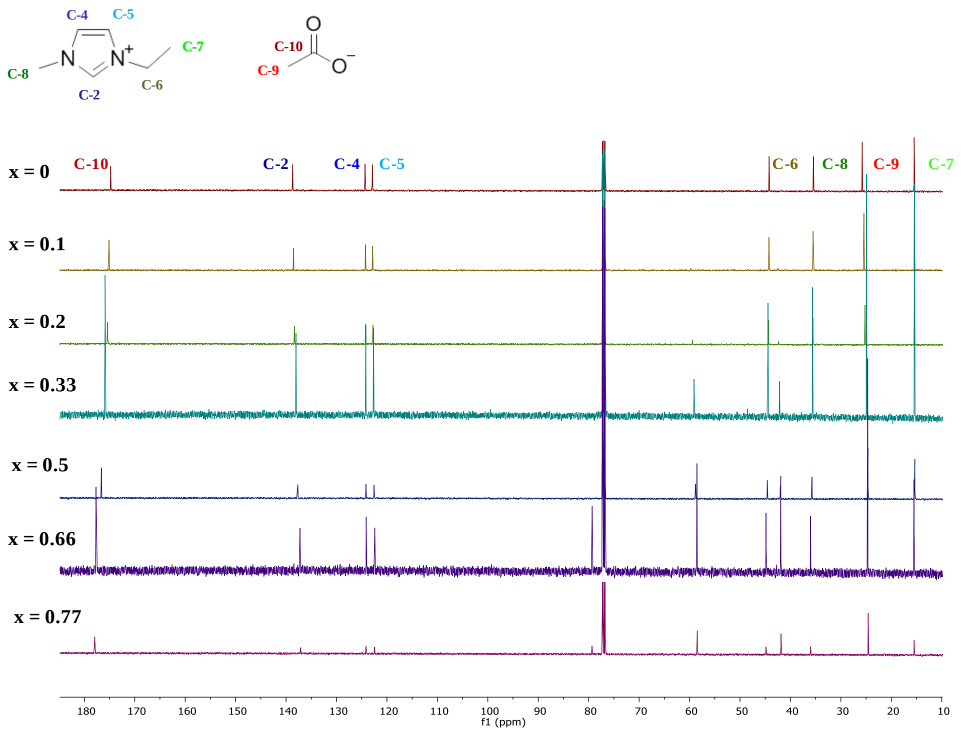

Figure S10. ^{13}C NMR spectra of $[NH_3(CH_2)_2OH]_x[C_2mim]_{1-x}[OAc]$ at 25ºC using $CDCl_3$ as external lock (x corresponds to the molar ratio of $[NH_3(CH_2)_2OH]^+/[OAc]^-$), in which zero corresponds to $[C_2mim][OAc]$).

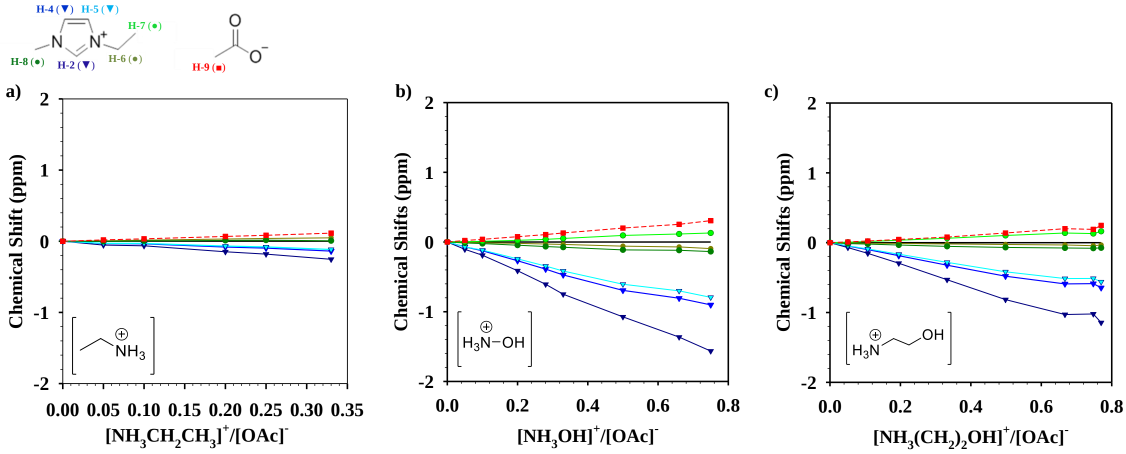

Figure S11. [1]H NMR chemical shifts of the [C2mim][OAc] ring protons of a) [NH3CH2CH3]x[C2mim]1-x[OAc], b) [NH3OH]x[C2mim]1-x[OAc], and c) [NH3(CH2)2OH]x[C2mim]1-x[OAc] (zero on the axis corresponds to [C2mim][OAc]).

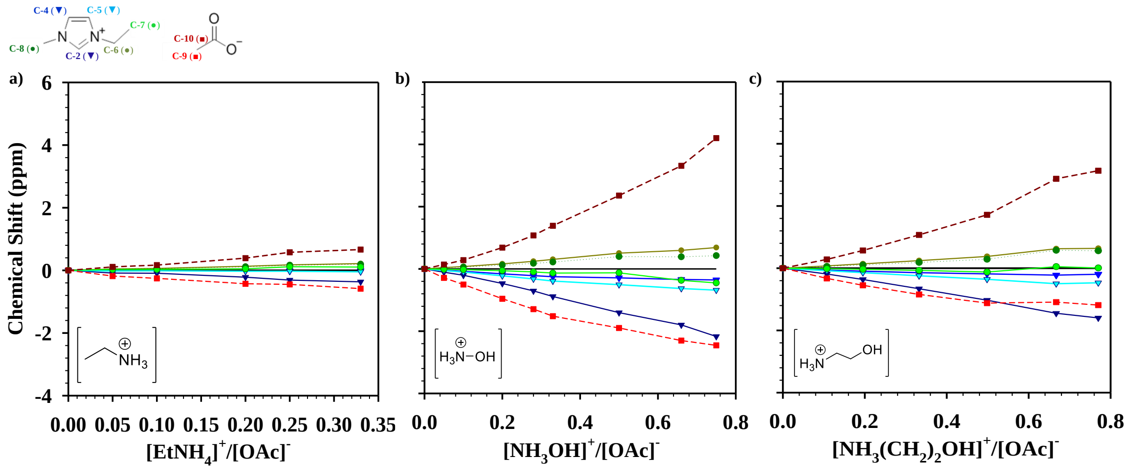

Figure S12. [13]C NMR chemical shifts of the [C2mim][OAc] ring protons of a) [NH3CH2CH3]x[C2mim]1-x[OAc], b) [NH3OH]x[C2mim]1-x[OAc], and c) [NH3(CH2)2OH]x[C2mim]1-x[OAc] (zero on the axis corresponds to [C2mim][OAc]).

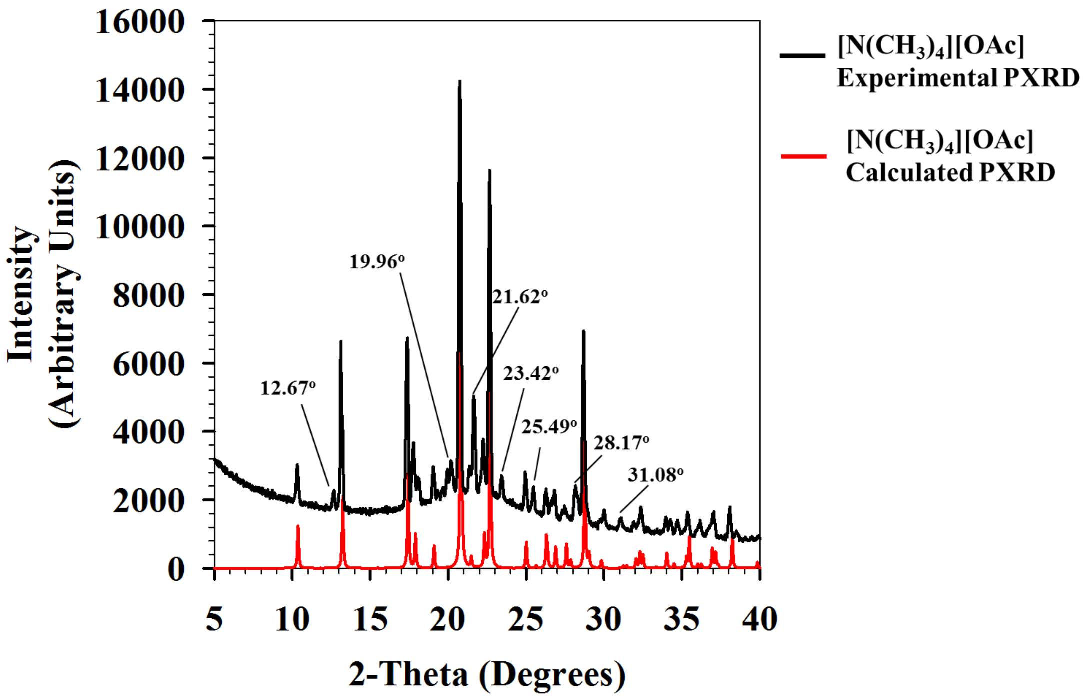

Figure S13. PXRD pattern of $[N(CH_3)_4][OAc]$ *vs.* simulated pattern from crystal structure. Unidentified peaks from the experimental pattern are labeled with positions.

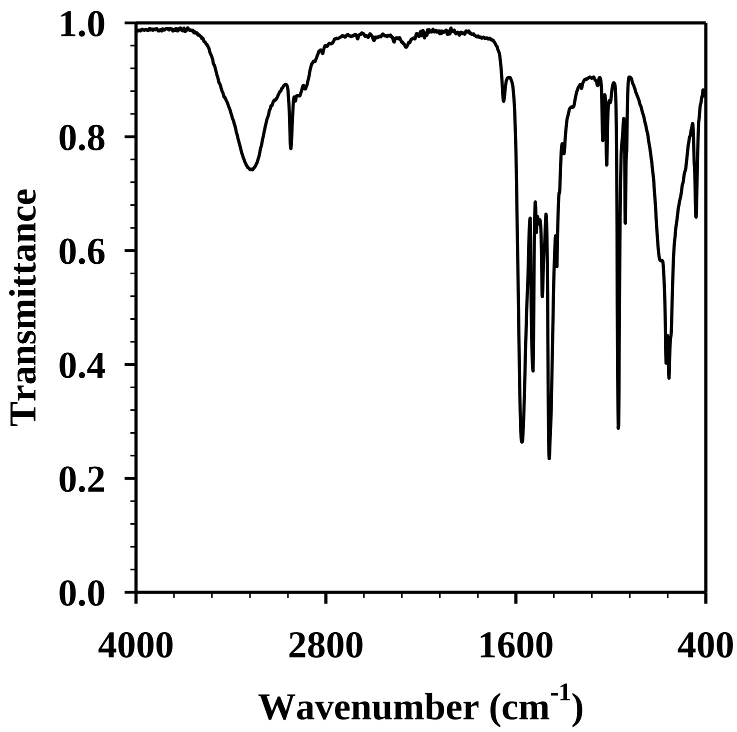

Figure S14. IR spectrum of $[N(CH_3)_4][OAc]$.

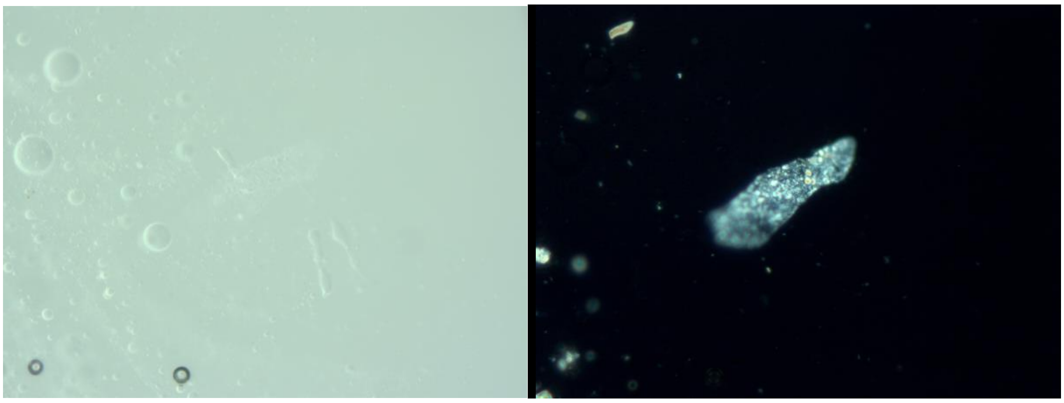

Figure S15: Optical micrographs at 50x magnification of $[N(CH_3)_4][OAc]$ under ordinary transmitted light (*left*) and crossed polarizers (*right*).