



Supplementary Materials

Measurement and modeling of solubility of galactose in aqueous ionic liquids, 1-butyl-3-methyl imidazolium bromide, 1-hexyl-3-methyl imidazolium bromide and 1-butyl-3-methylimidazolium chloride at $T = (298.15 \text{ and } 308.15) \text{ K}$

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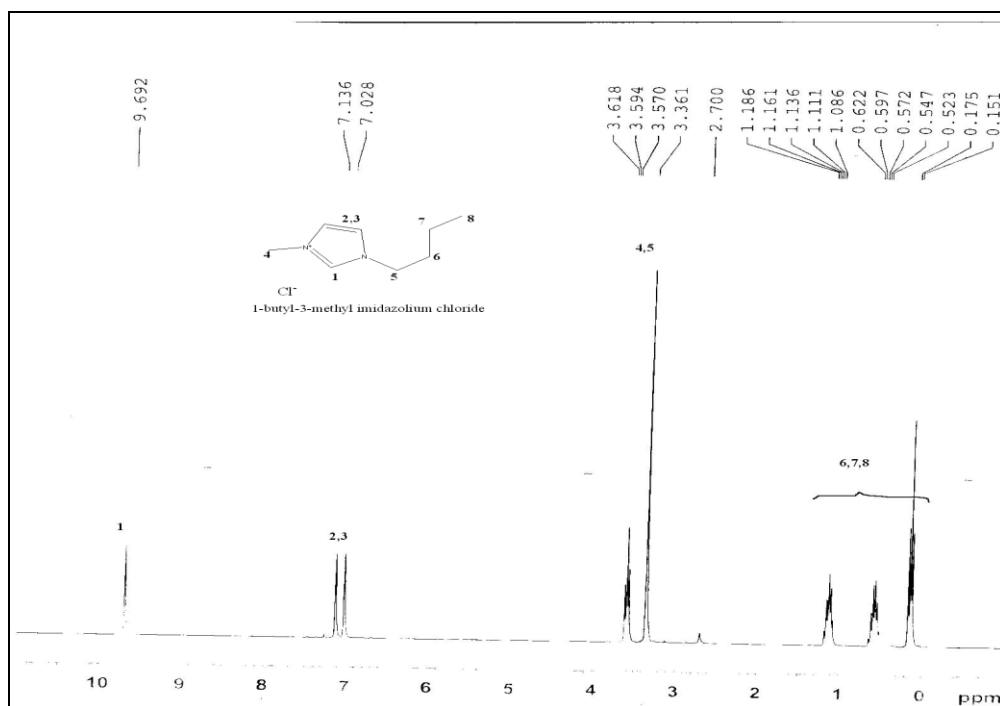
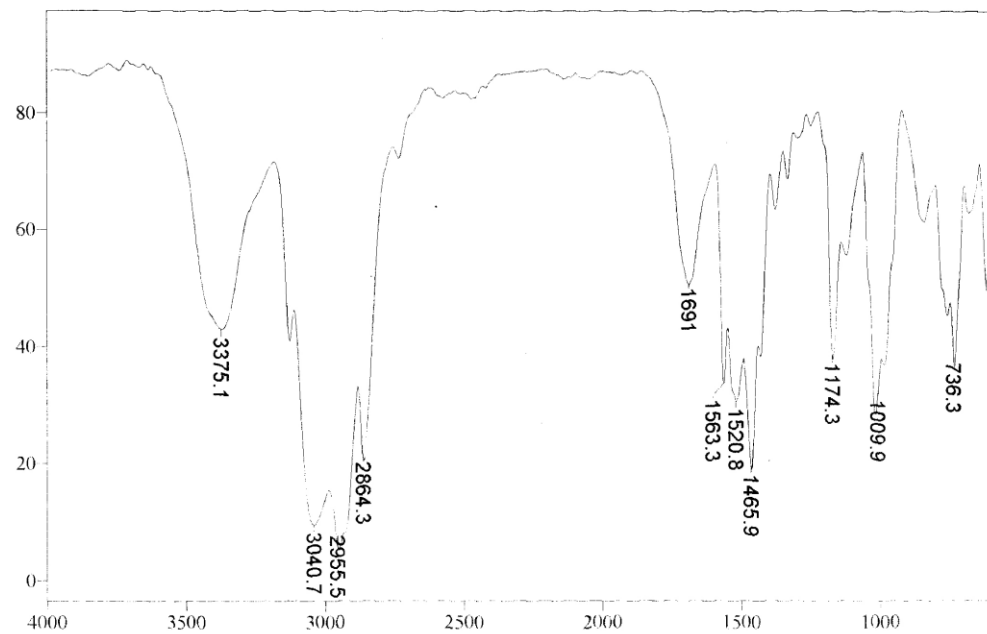


Figure S1. ¹H NMR and FTIR spectra of the ionic liquid [BMIm]Cl.

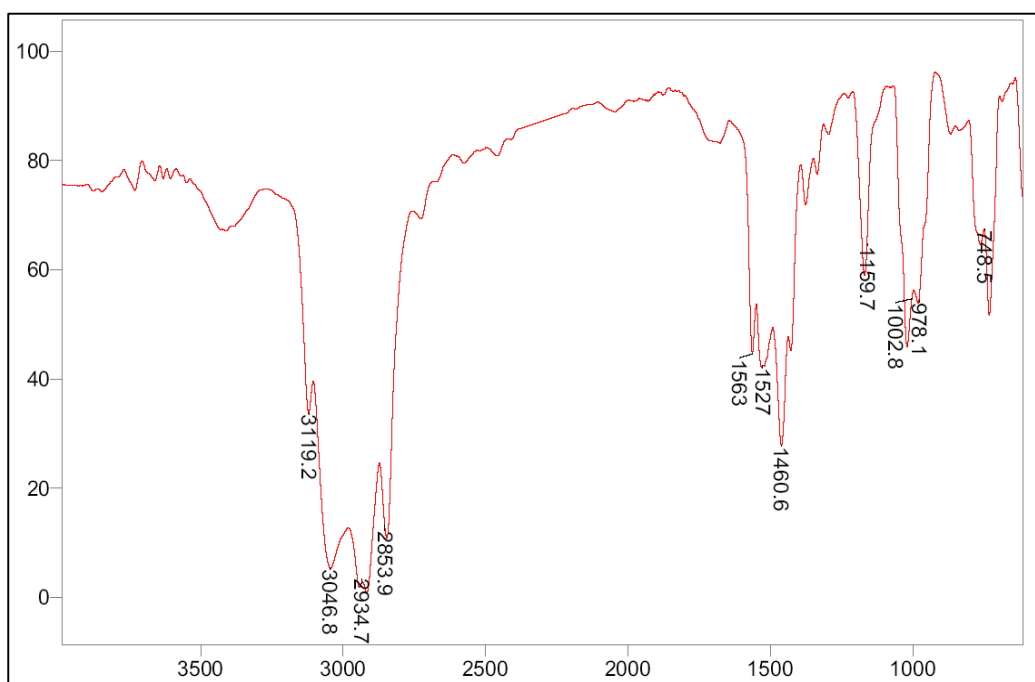
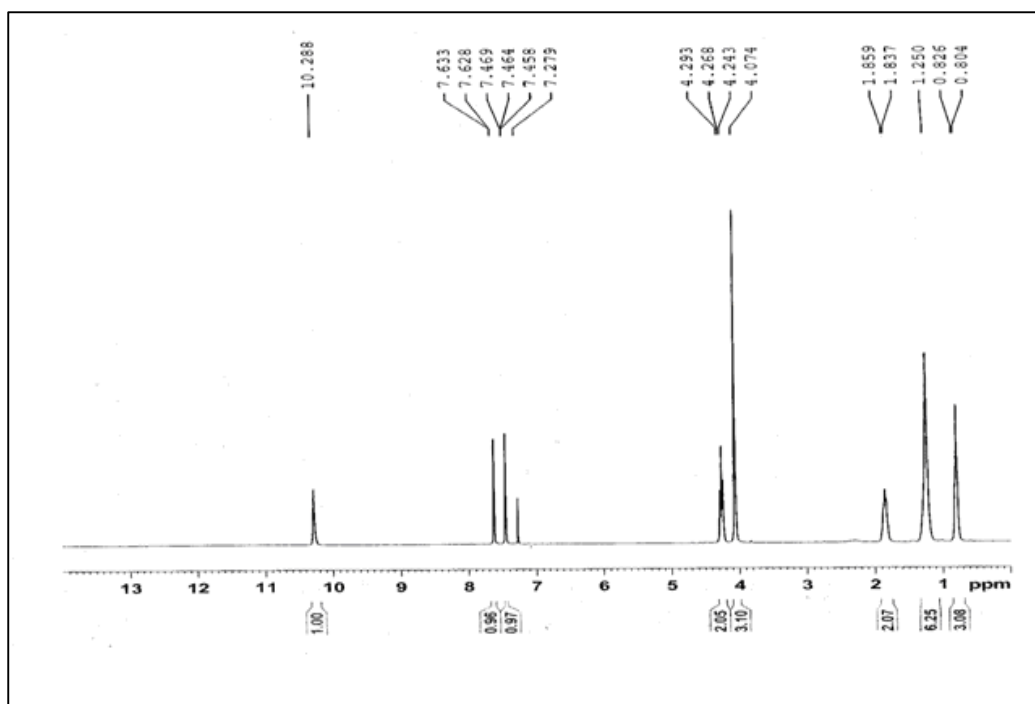


Figure S2. ¹H NMR and FTIR spectra of the ionic liquid [HMIm]Br.

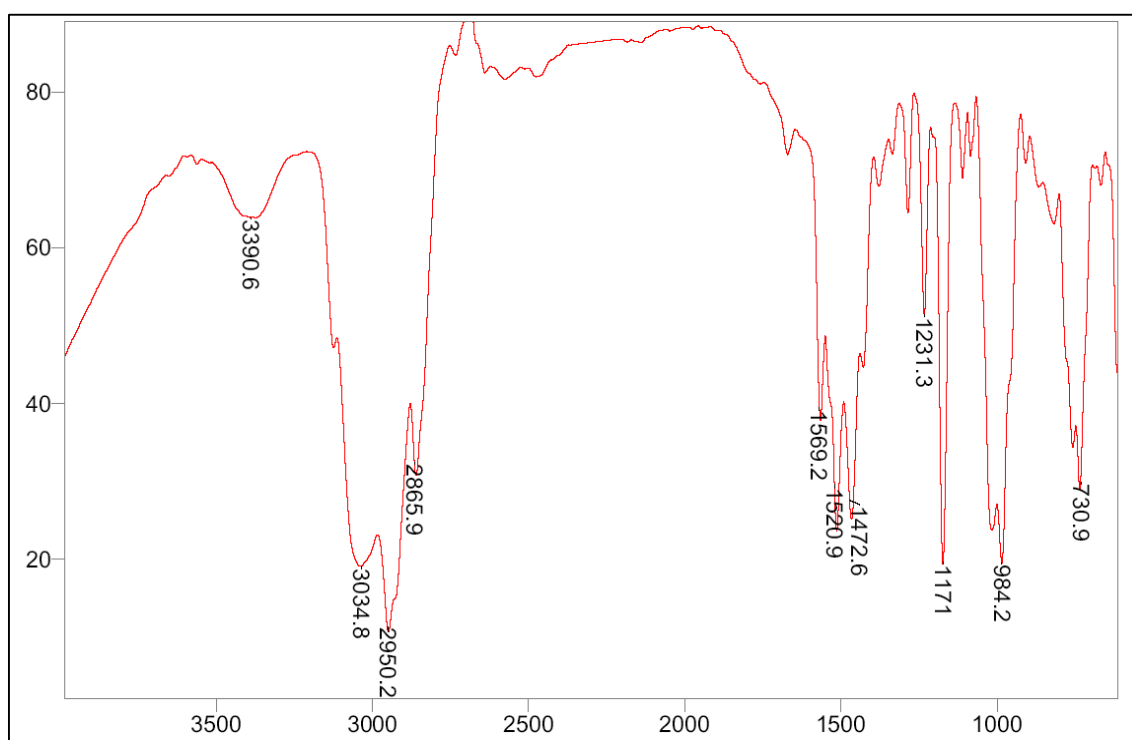
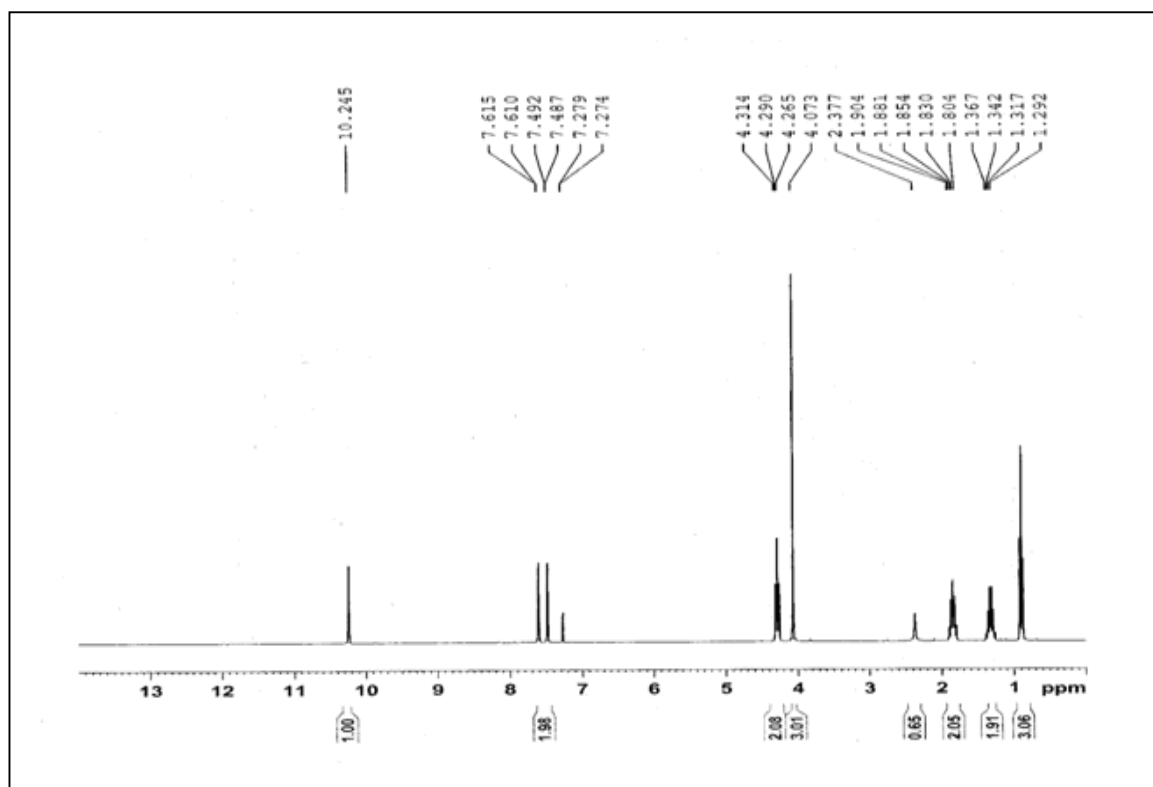


Figure S3. ¹H NMR and FTIR spectra of the ionic liquid [BMIm]Br.

Table S1

Solubility of galactose in water and aqueous [BMIm]Br solutions along with those predicted from different local composition models at $T = 298.15$ K.^{a, b}

x_{IL}	x_{exp}	x_{cal}^{wilson}	x_{cal}^{NRTL}	x_{cal}^{mNRTL}	x_{cal}^{NRF}	$x_{cal}^{UNIQUAC}$
0.0000	0.0462	0.0462	0.0463	0.0463	0.0463	0.0463
0.0069	0.0440	0.0440	0.0440	0.0440	0.0440	0.0440
0.0103	0.0430	0.0429	0.0429	0.0429	0.0429	0.0429
0.0136	0.0418	0.0419	0.0419	0.0419	0.0419	0.0419
0.0203	0.0399	0.0399	0.0399	0.0399	0.0399	0.0399

^a Standard uncertainties u for solubility, temperature and pressure are $u(x) = 0.1$, $u(T) = 0.01$ K, $u(p) = 0.5$ kPa, respectively.

^b Relative standard uncertainty u_r for mole fraction of ionic liquids is $u_r = 0.02$.

Table S2

Solubility of galactose in aqueous [HMIm]Br solutions along with those predicted from different local composition models at $T = 298.15$ K.^{a, b}

x_{IL}	x_{exp}	$x_{\text{cal}}^{\text{wilson}}$	$x_{\text{cal}}^{\text{NRTL}}$	$x_{\text{cal}}^{\text{mNRTL}}$	$x_{\text{cal}}^{\text{NRF}}$	$x_{\text{cal}}^{\text{UNIQUAC}}$
0.0034	0.0455	0.0457	0.0457	0.0457	0.0457	0.0457
0.0068	0.0450	0.0451	0.0451	0.0451	0.0451	0.0450
0.0103	0.0444	0.0445	0.0445	0.0445	0.0445	0.0445
0.0135	0.0440	0.0440	0.0440	0.0440	0.0439	0.0440

^a Standard uncertainties u for solubility, temperature and pressure are $u(x) = 0.1$, $u(T) = 0.01$ K, $u(p) = 0.5$ kPa, respectively.

^b Relative standard uncertainty u_r for mole fraction of ionic liquids is $u_r = 0.02$.

Table S3

Solubility of galactose in aqueous [BMIm]Cl solutions along with those predicted from different local composition models at $T = 298.15$ K.^{a, b}

x_{IL}	x_{exp}	x_{cal}^{wilson}	x_{cal}^{NRTL}	x_{cal}^{mNRTL}	x_{cal}^{NRF}	$x_{cal}^{UNIQUAC}$
0.0069	0.0438	0.0437	0.0437	0.0438	0.0437	0.0437
0.0104	0.0424	0.0425	0.0424	0.0425	0.0424	0.0425
0.0136	0.0414	0.0413	0.0412	0.0413	0.0412	0.0413
0.0205	0.0389	0.0389	0.039	0.0389	0.0390	0.0389

^a Standard uncertainties u for solubility, temperature and pressure are $u(x) = 0.1$, $u(T) = 0.01$ K, $u(p) = 0.5$ kPa, respectively.

^b Relative standard uncertainty u_r for mole fraction of ionic liquids is $u_r = 0.02$.

Table S4

Solubility of galactose in water and aqueous [BMIm]Br solutions along with those predicted from different local composition models at $T = 308.15$ K.^{a, b}

x_{IL}	x_{exp}	x_{cal}^{wilson}	x_{cal}^{NRTL}	x_{cal}^{mNRTL}	x_{cal}^{NRF}	$x_{cal}^{UNIQUAC}$
0.0000	0.0553	0.0555	0.0557	0.0557	0.0555	0.0529
0.0032	0.0529	0.0537	0.0534	0.0534	0.0535	0.0519
0.0068	0.0509	0.0517	0.0511	0.0512	0.0513	0.0507
0.0101	0.0496	0.0499	0.0493	0.0493	0.0496	0.0494
0.0135	0.0479	0.0482	0.0478	0.0478	0.0480	0.0481
0.0170	0.0466	0.0465	0.0465	0.0465	0.0465	0.0468
0.0201	0.0455	0.0450	0.0456	0.0456	0.0453	0.0455

^a Standard uncertainties u for solubility, temperature and pressure are $u(x) = 0.1$, $u(T) = 0.01$ K, $u(p) = 0.5$ kPa, respectively.

^b Relative standard uncertainty u_r for mole fraction of ionic liquids is $u_r = 0.02$.

Table S5

Solubility of galactose in aqueous [HMIm]Br solutions along with those predicted from different local composition models at $T = 308.15$ K.^{a, b}

x_{IL}	x_{exp}	$x_{\text{cal}}^{\text{wilson}}$	$x_{\text{cal}}^{\text{NRTL}}$	$x_{\text{cal}}^{\text{mNRTL}}$	$x_{\text{cal}}^{\text{NRF}}$	$x_{\text{cal}}^{\text{UNIQUAC}}$
0.0067	0.0516	0.0520	0.0517	0.0517	0.0517	0.0510
0.0102	0.0501	0.0503	0.0500	0.0500	0.0500	0.0499
0.0135	0.0485	0.0487	0.0485	0.0485	0.0486	0.0487
0.0168	0.0473	0.0472	0.0472	0.0472	0.0472	0.0474
0.0202	0.0461	0.0458	0.0461	0.0461	0.0461	0.0461

^a Standard uncertainties u for solubility, temperature and pressure are $u(x) = 0.1$, $u(T) = 0.01$ K, $u(p) = 0.5$ kPa, respectively.

^b Relative standard uncertainty u_r for mole fraction of ionic liquids is $u_r = 0.02$.

Table S6

Solubility of galactose in aqueous [BMIm]Cl solutions along with those predicted from different local composition models at $T = 308.15$ K.^{a, b}

x_{1L}	x_{exp}	x_{cal}^{wilson}	x_{cal}^{NRTL}	x_{cal}^{mNRTL}	x_{cal}^{NRF}	$x_{cal}^{UNIQUAC}$
0.0036	0.0519	0.0530	0.0531	0.0518	0.0518	0.0512
0.0066	0.0493	0.0508	0.0509	0.0495	0.0495	0.0497
0.0105	0.0473	0.0480	0.0480	0.0471	0.0471	0.0477
0.0170	0.0446	0.0435	0.0434	0.0447	0.0446	0.0443

^a Standard uncertainties u for solubility, temperature and pressure are $u(x) = 0.1$, $u(T) = 0.01$ K, $u(p) = 0.5$ kPa, respectively.

^b Relative standard uncertainty u_r for mole fraction of ionic liquids is $u_r = 0.02$.