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Supplementary Informations

Effect of Structural Variations in Cation of Ionic Liquids on the Coexistence Curve of Isobutyric Acid and Water

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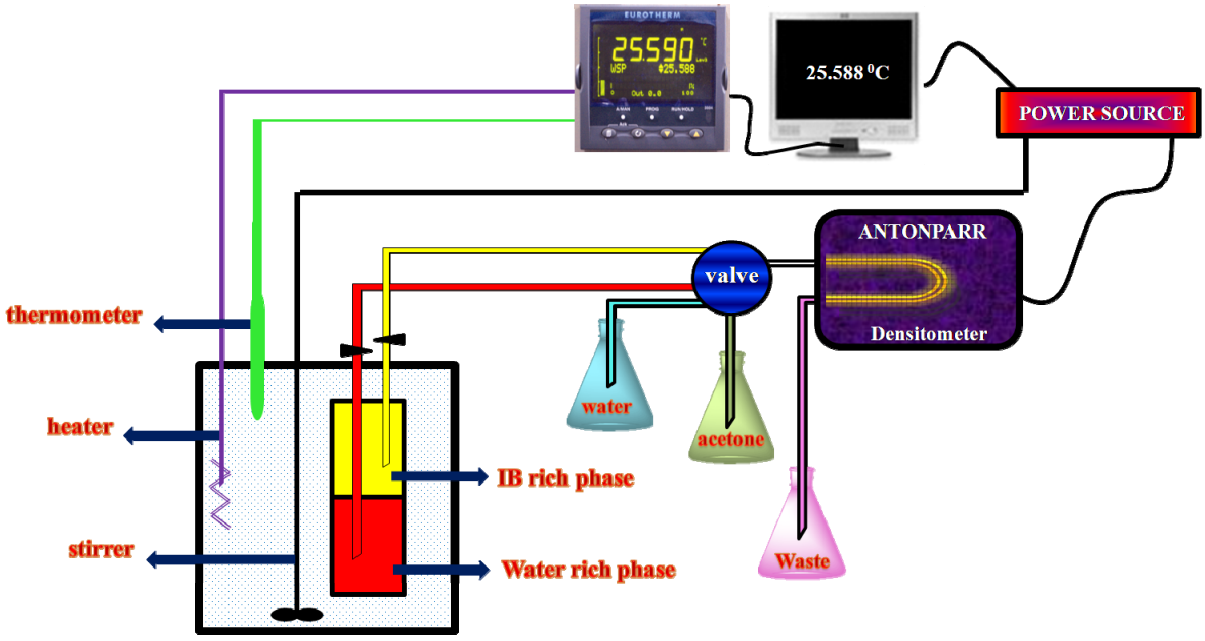
For a sample of pure IBW, we prepared from 2.508 g of water and 1.5505 g of IB with a UCST of 26.924 ^{0}C using equal volume criterion. The cell containing the solution mixture was immersed in the isolated water bath where it could be seen through a window of the water bath. The temperature of the water bath was controlled up to third decimal place (for instance 25.003 ^{0}C with an accuracy of $\pm$ 0.002) using a Eurotherm temperature controller (Eurotherm 3500 Series) attached with a RTD probe.



Scheme IS. Schematic representation of experimental set up to determine the critical coexisting curve using density measurements.

Table IS. Coexistence curve data for Isobutyric acid and water (IBW) with and without 1-Hexyl-3-Methyl Imidazolium Tetrafluoroborate (IL-1). The measured data are of the densities of IB (ρ_1) and water rich phase (ρ_2), respectively, as a function of temperature (T).

Pure		
T_c=26.924±0.002 ^{0}C; 0 mg/ml of IL in IBW		
T(^{0}C)	**ρ_1(g/cm^3)**	**ρ_2(g/cm^3)**
22.171	0.98711	1.00198
22.836	0.98755	1.00135
23.344	0.98768	1.00119
23.990	0.98791	1.00085
24.566	0.98813	1.00052
25.088	0.98854	1.00000
25.525	0.98907	0.99975
26.085	0.99023	0.99899
26.313	0.99047	0.99863
26.501	0.99105	0.99809
26.623	0.99135	0.99786
26.731	0.99185	0.99742
26.823	0.99250	0.99671
26.903	0.99316	0.99583
26.910	0.99325	0.99564
26.915	0.99343	0.99542
26.918	0.99357	0.99524
26.920	0.99369	0.99509
SET 1		
T_c=26.371±0.002 ^{0}C; 0.5 mg/ml of IL in IBW		
T(^{0}C)	**ρ_1(g/cm^3)**	**ρ_2(g/cm^3)**
22.004	0.98799	0.01366
22.257	0.98816	0.01326
22.489	0.98831	0.01288
22.744	0.98855	0.01244
22.992	0.98874	0.01209
23.276	0.98895	0.01161
23.495	0.98906	0.01135
23.786	0.98929	0.01092
24.017	0.98943	0.01075
24.229	0.98969	0.01013
24.418	0.98990	0.00964
24.902	0.99037	0.00836
25.205	0.99076	0.00765
25.422	0.99102	0.00706
25.740	0.99161	0.00611

25.859	0.99177	0.00570
26.006	0.99206	0.00521
26.064	0.99222	0.00470
26.193	0.99247	0.00402
26.263	0.99273	0.00351
26.310	0.99312	0.00281
26.326	0.99341	0.00227
26.340	0.99335	0.00221

SET 2

T_c=26.192±0.002 ^{0}C; 1.0 mg/ml of IL in IBW

T(^{0}C)	ρ_1(g/cm^3)	ρ_2(g/cm^3)
22.016	0.98922	1.00064
22.488	0.98944	1.00031
23.001	0.98986	0.99995
23.494	0.99018	0.99985
23.987	0.99071	0.99959
24.499	0.99104	0.99886
24.993	0.99138	0.99813
25.486	0.99217	0.99774
25.638	0.99219	0.99751
25.704	0.99249	0.99732
25.793	0.99270	0.99722
25.837	0.99296	0.99688
25.970	0.99326	0.99660
26.014	0.99361	0.99633
26.089	0.99390	0.99598
26.170	0.99410	0.99567
26.236	0.99429	0.99543

SET 3

T_c=24.309±0.002 ^{0}C; 1.5 mg/ml of IL in IBW

T(^{0}C)	ρ_1(g/cm^3)	ρ_2(g/cm^3)
21.993	0.99027	1.00041
22.443	0.99051	0.99996
22.827	0.99078	0.99950
23.253	0.99159	0.99879
23.487	0.99201	0.99835
23.764	0.99257	0.99759
23.957	0.99308	0.99698
24.062	0.99333	0.99678
24.148	0.99348	0.99647
24.191	0.99369	0.99657
24.269	0.99402	0.99617
24.309	0.99422	0.99590
24.315	0.99426	0.99582

SET 4

T_c=24.026±0.002 ^{0}C; 2.0 mg/ml of IL in IBW

T(^{0}C)	ρ_1(g/cm^3)	ρ_2(g/cm^3)
22.226	0.99130	0.99979
22.554	0.99161	0.99941
22.877	0.99190	0.99875
23.002	0.99209	0.99842
23.292	0.99251	0.99797
23.452	0.99280	0.99718
23.708	0.99324	0.99647
23.815	0.99354	0.99620
23.890	0.99378	0.99593
23.942	0.99395	0.99588
23.985	0.99411	0.99540
24.017	0.99423	0.99533
24.049	0.99427	0.99523

Table II. Coexistence curve data for Isobutyric acid and water (IBW) with 1-Benzyl- 3-Methyl Imidazolium Tetrafluoroborate (IL-2). The measured data are of the densities of IB (ρ_1) and water rich phase (ρ_2), respectively, as a function of temperature (T).

SET 1		
T_c=27.424±0.002 ^{0}C; 0.5 mg/ml of IL in IBW		
T(^{0}C)	**ρ_1(g/cm^3)**	**ρ_2(g/cm^3)**
22.000	0.98666	1.00257
22.500	0.98697	1.00226
23.000	0.98709	1.00193
23.500	0.98725	1.00172
24.000	0.98744	1.00141
24.500	0.98772	1.00099
25.000	0.98794	1.00049
25.500	0.98829	1.00018
26.000	0.98894	0.99952
26.500	0.99016	0.99894
27.004	0.99160	0.99801
27.174	0.99210	0.99729
27.285	0.99252	0.99672
27.352	0.99276	0.99604
27.369	0.99303	0.99573
27.388	0.99329	0.99542
27.416	0.99352	0.99511
27.430	0.99362	0.99500
27.461	0.99373	0.99489
27.502	0.99379	0.99478
SET 2		
T_c=27.549±0.002 ^{0}C; 1.0 mg/ml of IL in IBW		
T(^{0}C)	**ρ_1(g/cm^3)**	**ρ_2(g/cm^3)**
21.964	0.98627	1.0031
22.541	0.98654	1.00273
23.062	0.98678	1.00244
23.502	0.98682	1.00215
23.942	0.98713	1.00170
24.573	0.98729	1.00120
25.124	0.98764	1.00079
25.674	0.98799	1.00038
26.084	0.98866	0.99980
26.497	0.98967	0.99926
26.789	0.99022	0.99893
27.002	0.99081	0.99844
27.214	0.99140	0.99799

27.324	0.99195	0.99737
27.401	0.99218	0.99683
27.427	0.99230	0.99638
27.481	0.99265	0.99572
27.507	0.99281	0.99519

SET 3

T_c=28.458±0.002 ^{0}C; 1.5 mg/ml of IL in IBW

T(^{0}C)	ρ_1(g/cm^3)	ρ_2(g/cm^3)
22.172	0.98583	1.00379
22.782	0.98606	1.00333
23.075	0.98601	1.00306
23.586	0.98628	1.00270
24.098	0.98651	1.00233
25.002	0.98692	1.00188
25.407	0.98728	1.00147
25.689	0.98760	1.00120
26.271	0.98806	1.00056
26.505	0.98850	1.00020
26.853	0.98896	0.99975
27.192	0.98959	0.99909
27.515	0.99046	0.99843
27.810	0.99118	0.99757
28.072	0.99200	0.99683
28.202	0.99248	0.99632
28.260	0.99294	0.99629
28.298	0.99264	0.99609
28.326	0.99286	0.99558
28.381	0.99303	0.99564
28.409	0.99314	0.99541
28.520	0.99331	0.99530

SET 4

T_c=28.591±0.002 ^{0}C; 2.0 mg/ml of IL in IBW

T(^{0}C)	ρ_1(g/cm^3)	ρ_2(g/cm^3)
22.000	0.98510	1.00435
22.502	0.98520	1.00416
23.500	0.98560	1.00340
24.011	0.98588	1.00326
24.500	0.98615	1.00264
24.982	0.98651	1.00226
25.469	0.98692	1.00179
26.010	0.98756	1.00112
26.499	0.98832	1.00051
27.010	0.98891	0.99970

27.483	0.98982	0.99885
27.985	0.99072	0.99781
28.201	0.99157	0.99702
28.258	0.99186	0.99668
28.292	0.99201	0.99647
28.351	0.99225	0.99625
28.390	0.99252	0.99617
28.420	0.99261	0.99593
28.515	0.99286	0.99587