

SUPPORTING INFORMATION

Evaluation of the solvent structural effect upon the vapor – liquid equilibrium of [C₄C₁im][Cl] + Alcohols

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Table S1. Experimental Isobaric VLE Data for the System [C₄C₁im][Cl] (1) + Methanol (2) at (0.1, 0.07 and 0.05) MPa Pressures.

0.1 MPa			0.07 MPa			0.05 MPa		
x_2	T / K	γ_2	x_2	T / K	γ_2	x_2	T / K	γ_2
1.000	337.38	1.000	1.000	328.62	1.000	1.000	320.80	1.000
0.991	337.77	0.992	0.991	328.87	0.998	0.991	321.15	0.996
0.983	338.03	0.990	0.984	329.02	0.996	0.982	321.40	0.992
0.972	338.37	0.989	0.976	329.26	0.994	0.980	321.44	0.994
0.960	338.77	0.985	0.961	329.80	0.989	0.962	321.98	0.987
0.952	339.17	0.977	0.949	330.34	0.979	0.955	322.52	0.969
0.939	339.98	0.961	0.957	330.03	0.985	0.956	322.21	0.981
0.932	340.35	0.953	0.940	330.86	0.967	0.927	324.04	0.935
0.914	341.75	0.921	0.925	331.84	0.943	0.923	324.32	0.929
0.893	343.30	0.889	0.904	333.08	0.917	0.894	326.26	0.881
0.889	343.66	0.880	0.895	333.58	0.911	0.903	325.46	0.902
0.866	345.25	0.853	0.891	334.11	0.895	0.899	325.79	0.894
0.861	345.80	0.840	0.871	335.40	0.870	0.870	327.68	0.851
0.849	347.21	0.808	0.877	335.07	0.877	0.877	326.95	0.870
0.843	347.92	0.792	0.863	336.36	0.844	0.864	328.24	0.839
0.815	350.51	0.746	0.844	338.13	0.805	0.842	329.71	0.809
0.793	352.51	0.714	0.834	339.01	0.786	0.832	330.59	0.789
0.787	353.36	0.697	0.802	341.63	0.739	0.815	332.71	0.740
0.766	354.78	0.681	0.778	344.69	0.678	0.776	336.61	0.665
0.757	355.78	0.665	0.763	346.16	0.655	0.793	334.97	0.695
0.732	358.88	0.619	0.760	346.57	0.647	0.753	338.94	0.625
0.709	361.74	0.580	0.715	351.61	0.573	0.736	340.88	0.593
			0.686	355.44	0.521	0.727	342.39	0.567
						0.708	344.82	0.531

Standard uncertainties are $u(T) = 0.05$ K, $u(x) = 0.001$, $u(p) = 5.0 \cdot 10^{-5}$ MPa and $u(\gamma) = 0.05$.

Table S2. Experimental Isobaric VLE Data for the System [C₄C₁im][Cl] (1) + propan-1-ol (2) at (0.1, 0.07 and 0.05) MPa Pressures.

0.1 MPa			0.07 MPa			0.05 MPa		
x_2	T / K	γ_2	x_2	T / K	γ_2	x_2	T / K	γ_2
1.000	369.99	1.000	1.000	360.86	1.000	1.000	352.75	1.000
0.973	370.00	1.027	0.976	361.35	1.004	0.977	353.20	1.005
0.956	370.86	1.012	0.944	362.15	1.006	0.951	353.89	1.002
0.939	371.70	0.999	0.968	361.35	1.013	0.967	353.30	1.010
0.909	372.64	0.994	0.908	363.41	0.994	0.923	354.58	1.003
0.887	373.57	0.985	0.887	364.01	0.994	0.887	356.28	0.972
0.863	374.50	0.979	0.864	364.87	0.989	0.863	357.40	0.953
0.845	376.29	0.938	0.845	366.23	0.958	0.845	358.48	0.931
0.825	378.02	0.902	0.826	367.60	0.930	0.826	359.58	0.911
0.804	379.29	0.884	0.804	368.96	0.906	0.804	360.63	0.897
0.782	380.51	0.870	0.784	370.33	0.882	0.784	361.77	0.878
0.765	382.43	0.832	0.769	372.30	0.836	0.767	363.49	0.839
0.746	384.23	0.801	0.743	374.23	0.804	0.745	365.14	0.807
0.718	385.66	0.793	0.721	375.92	0.779	0.720	366.65	0.787
0.687	387.16	0.787	0.698	377.80	0.752	0.697	368.16	0.769
0.663	390.70	0.726	0.666	379.26	0.750	0.661	371.17	0.723
0.631	392.42	0.721	0.632	381.57	0.728	0.630	372.98	0.709
0.597	395.45	0.691	0.603	383.97	0.702	0.611	374.79	0.686
0.575	397.91	0.664	0.561	387.21	0.676	0.570	376.92	0.680
0.529	401.93	0.637	0.534	391.10	0.623	0.533	381.07	0.628
0.497	406.32	0.594	0.489	394.35	0.611	0.490	384.94	0.597
0.459	410.89	0.563	0.459	400.45	0.537	0.458	388.84	0.560

Standard uncertainties are $u(T) = 0.05$ K, $u(x) = 0.001$, $u(p) = 5.0 \cdot 10^{-5}$ MPa and $u(\gamma) = 0.05$.

Table S3. Experimental Isobaric VLE Data for the System [C₄C₁im][Cl] (1) + propan-2-ol (2) at (0.1, 0.07 and 0.05) MPa Pressures.

0.1 MPa			0.07 MPa			0.05 MPa		
x_2	T / K	γ_2	x_2	T / K	γ_2	x_2	T / K	γ_2
1.000	355.17	1.000	1.000	346.44	1.000	1.000	338.67	1.000
0.982	355.57	1.001	0.981	346.85	1.003	0.982	339.11	1.001
0.972	355.77	1.003	0.972	347.05	1.004	0.972	339.35	1.000
0.963	355.97	1.005	0.962	347.24	1.006	0.962	339.54	1.001
0.960	355.87	1.028	0.960	346.75	1.029	0.959	338.89	1.030
0.950	356.29	1.008	0.936	347.79	1.010	0.948	339.82	1.005
0.936	356.57	1.012	0.930	347.93	1.012	0.932	340.10	1.009
0.922	356.87	1.015	0.923	348.06	1.013	0.916	340.38	1.014
0.907	357.18	1.019	0.909	348.34	1.017	0.899	340.66	1.020
0.888	357.58	1.022	0.891	348.66	1.023	0.893	340.79	1.020
0.885	358.37	0.998	0.885	349.34	1.002	0.880	341.58	1.002
0.860	359.57	0.980	0.873	349.84	0.994	0.870	342.04	0.993
0.835	361.45	0.940	0.861	350.34	0.988	0.864	342.27	0.989
0.822	362.39	0.920	0.848	351.46	0.957	0.859	342.51	0.985
0.815	362.86	0.911	0.834	352.58	0.929	0.834	344.55	0.930
0.812	363.10	0.907	0.820	353.70	0.903	0.807	346.60	0.881
0.810	363.22	0.905	0.806	354.83	0.879	0.799	347.13	0.870
0.808	363.34	0.902	0.795	356.03	0.852	0.797	347.89	0.844
0.798	364.64	0.873	0.794	355.76	0.860	0.792	347.65	0.859
0.785	365.65	0.855	0.784	355.98	0.865	0.785	347.32	0.878
0.785	365.28	0.867	0.782	356.45	0.851	0.782	347.45	0.877
0.783	365.51	0.859	0.781	356.70	0.842	0.776	348.38	0.846
0.770	367.15	0.824	0.755	358.58	0.811	0.776	348.71	0.838
0.756	367.68	0.821	0.727	360.87	0.773	0.772	348.26	0.857
0.703	372.21	0.752	0.712	362.18	0.749	0.744	350.83	0.802
0.674	375.35	0.704	0.672	365.55	0.701	0.724	352.94	0.756
0.659	377.95	0.658	0.630	371.70	0.600	0.702	353.67	0.756
0.644	378.32	0.666	0.629	371.02	0.615	0.659	357.79	0.684
0.632	380.12	0.639	0.619	368.72	0.677	0.625	361.32	0.630
0.594	381.58	0.648	0.601	372.53	0.611	0.622	362.40	0.608
0.578	385.23	0.590	0.579	375.88	0.564	0.577	366.56	0.563
0.577	385.15	0.593	0.578	375.23	0.578	0.564	365.88	0.590
0.574	386.97	0.563	0.568	374.98	0.592	0.537	368.62	0.560
0.544	388.15	0.573	0.540	378.57	0.551			
0.542	388.75	0.563						

Standard uncertainties are $u(T) = 0.05$ K, $u(x) = 0.001$, $u(p) = 5.0 \cdot 10^{-5}$ MPa and $u(\gamma) = 0.05$.

Table S4. Experimental Isobaric VLE Data for the System [C₄C₁im][Cl] (1) + butan-1-ol (2) at (0.1, 0.07 and 0.05) MPa Pressures.

0.1 MPa			0.07 MPa			0.05 MPa		
x ₂	T /K	γ ₂	x ₂	T /K	γ ₂	x ₂	T /K	γ ₂
1.000	390.55	1.000	1.000	380.75	1.000	1.000	372.25	1.000
0.990	390.83	0.998	0.979	381.16	1.008	0.979	372.50	1.008
0.979	391.11	0.999	0.958	381.55	1.016	0.957	372.75	1.020
0.957	392.16	0.985	0.939	382.57	0.997	0.930	373.76	1.011
0.934	393.45	0.965	0.921	383.47	0.982	0.901	374.90	0.997
0.910	394.65	0.950	0.901	384.50	0.964	0.872	376.96	0.948
0.881	395.90	0.941	0.881	385.35	0.955	0.857	377.99	0.926
0.862	397.15	0.921	0.872	386.01	0.942	0.842	378.99	0.906
0.842	398.30	0.906	0.862	386.83	0.924	0.826	380.13	0.884
0.814	400.65	0.864	0.843	388.35	0.895	0.809	381.47	0.859
0.784	403.15	0.827	0.812	390.50	0.861	0.793	382.60	0.837
0.736	406.74	0.786	0.796	391.45	0.846	0.775	383.79	0.819
0.702	410.26	0.738	0.780	392.37	0.837	0.748	385.78	0.785
0.666	413.70	0.700	0.769	394.05	0.803	0.739	386.15	0.784
0.642	416.25	0.673	0.740	396.55	0.765	0.721	388.73	0.735
0.776	403.75	0.821	0.703	400.80	0.700	0.692	391.40	0.698
0.565	423.68	0.617	0.665	404.95	0.645	0.662	393.83	0.670
0.499	431.00	0.570	0.628	408.20	0.617	0.629	397.15	0.631
0.582	422.49	0.618	0.589	411.60	0.591	0.624	398.45	0.607
						0.594	400.40	0.598

Standard uncertainties are $u(T) = 0.05$ K, $u(x) = 0.001$, $u(p) = 5.0 \cdot 10^{-5}$ MPa and $u(\gamma) = 0.05$.

Table S5. Experimental Isobaric VLE Data for the System [C₄C₁im][Cl] (1) + butan-2-ol (2) at (0.1, 0.07 and 0.05) MPa Pressures.

0.1 MPa			0.07 MPa			0.05 MPa		
x_2	T / K	γ_2	x_2	T / K	γ_2	x_2	T / K	γ_2
0.997	372.15	1.013	0.997	363.15	1.002	0.997	354.75	1.010
0.992	372.23	1.014	0.993	363.20	1.004	0.993	354.80	1.012
0.988	372.31	1.016	0.988	363.26	1.006	0.988	354.85	1.014
0.978	372.47	1.020	0.979	363.37	1.011	0.979	354.95	1.019
0.988	372.61	1.006	0.970	363.48	1.016	0.988	355.01	1.008
0.969	372.63	1.024	0.960	363.59	1.022	0.970	355.05	1.025
0.959	372.80	1.028	0.951	363.70	1.028	0.960	355.15	1.030
0.969	373.01	1.011	0.941	363.81	1.034	0.951	355.25	1.037
0.938	373.12	1.038	0.979	363.86	0.992	0.970	355.30	1.014
0.944	373.20	1.029	0.970	364.07	0.996	0.941	355.35	1.043
0.949	373.28	1.021	0.924	364.29	1.033	0.960	355.54	1.014
0.917	373.45	1.050	0.907	364.77	1.033	0.918	356.25	1.032
0.928	373.54	1.035	0.893	365.51	1.019	0.893	356.93	1.028
0.904	374.06	1.040	0.893	365.94	1.002	0.879	357.62	1.016
0.892	374.67	1.032	0.879	366.24	1.006	0.879	357.90	1.004
0.878	375.28	1.024	0.879	366.49	0.998	0.864	358.31	1.004
0.865	375.89	1.017	0.864	366.98	0.995	0.864	358.70	0.988
0.847	376.83	1.003	0.864	367.12	0.989	0.824	360.40	0.967
0.832	377.87	0.983	0.841	367.89	0.989	0.823	361.04	0.943
0.832	377.99	0.980	0.841	368.90	0.951	0.814	361.17	0.949
0.817	378.98	0.965	0.823	369.35	0.952	0.809	361.56	0.940
0.817	379.15	0.958	0.814	370.08	0.936	0.806	361.75	0.936
0.806	380.35	0.931	0.805	370.81	0.921	0.803	361.95	0.932
0.806	381.01	0.912	0.789	372.33	0.889	0.771	364.85	0.865
0.783	383.15	0.872	0.772	373.85	0.859	0.736	367.76	0.809
0.752	385.65	0.833	0.736	376.89	0.806	0.707	370.03	0.773
0.725	388.15	0.795	0.710	379.65	0.760	0.692	371.16	0.758
0.712	389.30	0.779	0.697	381.03	0.738	0.684	371.73	0.750
0.698	390.45	0.765	0.693	381.37	0.733	0.676	372.30	0.743
0.669	392.75	0.740	0.690	381.72	0.728	0.650	374.30	0.718
0.655	394.32	0.721	0.652	383.45	0.723	0.637	375.50	0.701
0.639	395.05	0.721	0.640	384.92	0.702	0.624	376.70	0.685
0.623	396.20	0.713	0.628	386.40	0.681	0.594	379.10	0.660
0.607	397.35	0.706	0.597	388.35	0.671			
0.591	398.75	0.696	0.577	389.81	0.661			

Standard uncertainties are $u(T) = 0.05$ K, $u(x) = 0.001$, $u(p) = 5.0 \cdot 10^{-5}$ MPa and $u(\gamma) = 0.05$.

Table S6. Experimental Isobaric VLE Data for the System [C₄C₁im][Cl] (1) + tert-butanol (2) at (0.1, 0.07 and 0.05) MPa Pressures.

0.1 MPa			0.07 MPa			0.05 MPa		
x_2	T / K	γ_2	x_2	T / K	γ_2	x_2	T / K	γ_2
1.000	355.62	1.000	1.000	346.72	1.000	1.000	339.10	1.000
0.980	354.89	1.034	0.979	346.39	1.029	0.979	338.58	1.034
0.945	355.57	1.044	0.965	346.77	1.026	0.974	339.00	1.022
0.931	355.80	1.050	0.950	347.15	1.026	0.945	339.45	1.028
0.917	355.95	1.060	0.942	347.34	1.026	0.922	340.09	1.026
0.904	356.13	1.070	0.934	347.53	1.026	0.918	340.44	1.013
0.896	356.15	1.081	0.918	347.92	1.027	0.899	340.67	1.026
0.882	356.50	1.081	0.903	348.35	1.029	0.895	340.74	1.026
0.882	356.75	1.069	0.865	349.49	1.023	0.862	342.02	1.007
0.865	357.98	1.039	0.842	350.80	0.995	0.819	344.28	0.960
0.857	358.11	1.046	0.818	351.92	0.978	0.776	347.18	0.896
0.820	360.45	0.999	0.797	353.45	0.943	0.766	347.99	0.878
0.798	362.20	0.957	0.776	355.05	0.911	0.726	351.80	0.793
0.776	363.60	0.939	0.772	355.81	0.891	0.729	352.75	0.762
0.779	364.30	0.913	0.731	359.85	0.801	0.672	356.33	0.714
0.743	367.55	0.851	0.707	362.30	0.757	0.645	358.80	0.676
0.731	369.66	0.800	0.682	364.75	0.717	0.617	361.15	0.647
0.713	370.70	0.792	0.654	366.97	0.693	0.578	363.15	0.641
0.683	372.85	0.769	0.624	369.15	0.670	0.536	365.79	0.628
0.650	375.72	0.732	0.596	372.16	0.632	0.511	367.74	0.615
0.616	378.58	0.703	0.568	375.15	0.599	0.485	369.07	0.617
0.584	381.68	0.672						
0.550	384.21	0.657						

Standard uncertainties are $u(T) = 0.05$ K, $u(x) = 0.001$, $u(p) = 5.0 \cdot 10^{-5}$ MPa and $u(\gamma) = 0.05$.

Table S7. Experimental Isobaric VLE Data for the System [C₄C₁im][Cl] (1) + iso-butanol (2) at (0.1, 0.07 and 0.05) MPa Pressures.

0.1 MPa			0.07 MPa			0.05 MPa		
x ₂	T /K	γ ₂	x ₂	T /K	γ ₂	x ₂	T /K	γ ₂
1.000	380.70	1.000	1.0000	371.26	1.000	1.000	362.85	1.000
0.996	380.96	0.995	0.9951	371.35	1.001	0.996	363.10	0.999
0.975	381.21	1.005	0.9739	371.85	1.002	0.975	363.57	0.996
0.952	381.47	1.019	0.9515	372.35	1.007	0.953	364.05	0.999
0.932	382.64	0.999	0.9346	373.06	0.997	0.936	364.61	0.997
0.913	384.95	0.940	0.9056	375.92	0.921	0.916	366.51	0.940
0.894	386.99	0.894	0.8955	376.88	0.899	0.896	367.98	0.905
0.883	388.94	0.845	0.8745	378.78	0.857	0.875	370.15	0.851
0.851	391.35	0.807	0.8636	379.31	0.852	0.864	371.00	0.835
0.845	392.02	0.794	0.8524	380.69	0.821	0.853	371.35	0.833
0.831	394.04	0.755	0.8322	383.37	0.763	0.833	373.93	0.773
0.810	396.73	0.710	0.8110	385.72	0.720	0.812	376.07	0.731
0.788	399.43	0.668	0.7887	388.24	0.677	0.790	378.43	0.686
0.765	402.12	0.632	0.7654	390.75	0.640	0.779	379.02	0.681
0.737	405.73	0.586	0.7372	394.95	0.578	0.767	380.80	0.648
0.722	407.55	0.566	0.7149	398.10	0.538	0.738	384.63	0.588
0.707	409.35	0.546	0.7072	399.15	0.526	0.707	388.45	0.537
0.671	414.25	0.498	0.6630	403.20	0.492	0.660	392.94	0.494
0.663	415.15	0.491	0.6351	406.38	0.466	0.635	395.52	0.471
0.615	420.94	0.449	0.6056	409.30	0.447	0.609	398.25	0.449

Standard uncertainties are $u(T) = 0.05$ K, $u(x) = 0.001$, $u(p) = 5.0 \cdot 10^{-5}$ MPa and $u(\gamma) = 0.05$.

Table S8. Experimental Isobaric VLE Data for the System [C₄C₁im][Cl] (1) + pentan-1-ol (2) at (0.1, 0.07 and 0.05) MPa Pressures.

0.1 MPa			0.07 MPa			0.05 MPa		
x_2	T / K	γ_2	x_2	T / K	γ_2	x_2	T / K	γ_2
1.000	410.40	1.000	1.000	399.85	1.000	1.000	390.50	1.000
0.983	411.05	0.997	0.974	400.15	1.018	0.964	390.85	1.026
0.963	411.60	0.999	0.944	400.95	1.020	0.945	391.65	1.019
0.942	412.36	0.996	0.917	402.27	1.004	0.926	392.30	1.015
0.922	413.03	0.997	0.890	403.47	0.993	0.903	393.50	0.996
0.889	414.85	0.977	0.864	404.90	0.973	0.880	394.65	0.978
0.818	418.10	0.957	0.832	405.91	0.978	0.831	397.10	0.946
0.787	421.15	0.905	0.763	412.56	0.855	0.777	401.15	0.879
0.745	426.13	0.822	0.756	414.00	0.824	0.697	407.15	0.799
0.706	430.15	0.773	0.725	416.65	0.793	0.762	400.80	0.907
0.666	434.09	0.733	0.692	419.40	0.762	0.756	402.68	0.857
0.631	437.85	0.698	0.661	423.45	0.705	0.573	420.65	0.632
0.595	441.45	0.671	0.639	425.75	0.682	0.605	417.30	0.663
0.568	444.55	0.646	0.616	427.55	0.670	0.637	413.84	0.703
0.761	423.80	0.864	0.570	431.45	0.648	0.725	405.15	0.822
0.801	420.99	0.894	0.794	409.25	0.918	0.793	399.39	0.916
0.816	419.00	0.933	0.816	408.55	0.914	0.795	398.85	0.932
1.000	410.05	1.008	1.000	399.27	1.019	0.666	410.65	0.744
0.854	416.55	0.962	0.839	406.25	0.957	1.000	389.32	1.046
0.664	432.70	0.766	0.663	422.75	0.719	0.661	412.63	0.707
0.740	425.70	0.842	0.739	414.97	0.819	0.787	400.17	0.897
0.813	418.47	0.954	0.787	410.10	0.897	0.856	395.90	0.959
			0.812	408.86	0.9059			

Standard uncertainties are $u(T) = 0.05$ K, $u(x) = 0.001$, $u(p) = 5.0 \cdot 10^{-5}$ MPa and $u(\gamma) = 0.05$.