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SUPPLEMENTARY MATERIAL TO

Solution thermodynamics of aqueous nicotinic acid solutions in the presence of tetrabutylammonium hydrogen sulphate

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TABLE S-I. Density (ρ) and viscosity (η) for aqueous solutions of nicotinic acid of different concentrations (c_{NA}) different at different temperatures

c_{NA} / mol dm^{-3}	T / K	$\rho\times10^{-3}$ / kg m^{-3}	η / mPa s
0.005	298.15	0.9972	0.879
	308.15	0.9941	0.717
	318.15	0.9903	0.578
0.010	298.15	0.9975	0.913
	308.15	0.9944	0.731
	318.15	0.9905	0.587
0.015	298.15	0.9977	0.929
	308.15	0.9947	0.754
	318.15	0.9908	0.609
0.020	298.15	0.9982	0.941
	308.15	0.9953	0.782
	318.15	0.9911	0.627

TABLE S-II. Molarities (c), densities (ρ), viscosities (η), apparent molar volumes (φ_V) and $(\eta_r - 1)/\sqrt{c}$ for Bu_4NHSO_4 in aqueous solutions of nicotinic acid of different concentrations (c_{NA})

c / mol dm^{-3}	$\rho\times10^{-3}$ / kg m^{-3}	η / mPa s	$\varphi_V^0\times10^6$ / m^3 mol^{-1}	$(\eta_r-1)/\sqrt{c}$ / mol$^{-1/2}$ dm$^{3/2}$
c_{NA} = 0.000 mol dm^{-3}				
T = 298.15 K				
0.0200	0.9977	0.884	308.94	0.0048
0.0360	0.9981	0.896	311.84	0.0331
0.0520	0.9984	0.907	314.88	0.0817
0.0680	0.9987	0.919	316.49	0.1232
0.0840	0.9989	0.928	318.68	0.1457
0.1000	0.9991	0.939	320.18	0.1726

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TABLE S-II. Continued

c / mol dm^{-3}	$\rho\times10^{-3}$ / kg m^{-3}	η / mPa s	$\varphi_V^0\times10^6$ / m^3 mol^{-1}	$(\eta_r-1)/\sqrt{c}$ / mol$^{-1/2}$ dm$^{3/2}$
c_{NA} = 0.000 mol dm^{-3}				
T = 308.15 K				
0.0200	0.9947	0.729	306.36	0.0943
0.0359	0.9952	0.739	309.62	0.1438
0.0518	0.9956	0.751	311.66	0.1930
0.0678	0.9959	0.764	314.27	0.2381
0.0838	0.9962	0.776	315.88	0.2718
0.0997	0.9964	0.790	317.96	0.3108
T = 318.15 K				
0.0199	0.9910	0.600	304.82	0.0476
0.0357	0.9915	0.612	307.52	0.1421
0.0516	0.9919	0.623	310.59	0.1994
0.0676	0.9923	0.633	312.26	0.2388
0.0835	0.9926	0.642	314.46	0.2671
0.0993	0.9928	0.654	316.95	0.3088
c_{NA} = 0.005 mol dm^{-3}				
T = 298.15 K				
0.0200	0.9978	0.902	310.41	0.1850
0.0360	0.9982	0.916	312.64	0.2218
0.0520	0.9985	0.935	315.42	0.2794
0.0680	0.9988	0.957	316.89	0.3403
0.0840	0.9990	0.985	319.00	0.4161
0.1000	0.9992	1.016	320.44	0.4929
T = 308.15 K				
0.0200	0.9948	0.741	307.85	0.2367
0.0359	0.9953	0.760	308.76	0.3165
0.0518	0.9956	0.783	312.99	0.4044
0.0678	0.9959	0.808	315.28	0.4874
0.0838	0.9963	0.831	315.49	0.5492
0.0997	0.9965	0.856	317.63	0.6139
T = 318.15 K				
0.0199	0.9911	0.604	305.81	0.3188
0.0357	0.9916	0.616	308.62	0.3479
0.0516	0.9920	0.628	310.56	0.3808
0.0676	0.9924	0.637	312.23	0.3926
0.0835	0.9926	0.647	315.03	0.4131
0.0994	0.9929	0.661	316.94	0.4555
c_{NA} = 0.010 mol dm^{-3}				
T = 298.15 K				
0.0200	0.9979	0.932	315.34	0.1471
0.0360	0.9983	0.957	317.01	0.2539
0.0520	0.9986	0.982	318.43	0.3314
0.0680	0.9988	1.003	320.65	0.3780

TABLE S-II. Continued

c / mol dm^{-3}	$\rho\times10^{-3}$ / kg m^{-3}	η / mPa s	$\varphi_V^0\times10^6$ / m^3 mol^{-1}	$(\eta_r-1)/\sqrt{c}$ / mol$^{-1/2}$ dm$^{3/2}$
c_{NA} = 0.010 mol dm^{-3}				
T = 298.15 K				
0.0840	0.9991	1.023	320.83	0.4157
0.1000	0.9993	1.048	321.96	0.4676
T = 308.15 K				
0.0200	0.9950	0.755	311.78	0.2321
0.0359	0.9954	0.775	313.72	0.3178
0.0518	0.9957	0.796	316.40	0.3907
0.0678	0.9960	0.819	317.87	0.4623
0.0838	0.9963	0.838	318.77	0.5056
0.0997	0.9966	0.854	319.36	0.5329
T = 318.15 K				
0.0199	0.9912	0.623	309.29	0.4347
0.0357	0.9916	0.633	311.39	0.4147
0.0516	0.9921	0.644	312.45	0.4275
0.0676	0.9925	0.661	313.66	0.4849
0.0835	0.9929	0.675	314.37	0.5188
0.0994	0.9932	0.691	315.86	0.5619
c_{NA} = 0.015 mol dm^{-3}				
T = 298.15 K				
0.0200	0.9981	0.950	320.26	0.1598
0.0360	0.9984	0.978	321.38	0.2779
0.0520	0.9987	1.005	321.81	0.3587
0.0680	0.9989	1.027	323.21	0.4045
0.0840	0.9991	1.050	324.08	0.4494
0.1000	0.9993	1.079	324.67	0.5106
T = 308.15 K				
0.0200	0.9952	0.769	318.71	0.1407
0.0359	0.9955	0.773	319.91	0.1329
0.0518	0.9958	0.796	320.77	0.2447
0.0678	0.9961	0.824	321.37	0.3565
0.0838	0.9963	0.847	322.04	0.4261
0.0997	0.9966	0.874	322.68	0.5040
T = 318.15 K				
0.0199	0.9914	0.630	314.78	0.2444
0.0357	0.9918	0.642	315.82	0.2868
0.0516	0.9922	0.649	316.27	0.2891
0.0676	0.9926	0.659	316.55	0.3158
0.0835	0.9929	0.670	317.89	0.3466
0.0994	0.9932	0.684	318.81	0.3906

TABLE S-II. Continued

c / mol dm^{-3}	$\rho\times10^{-3}$ / kg m^{-3}	η / mPa s	$\varphi_V^0\times10^6$ / m^3 mol^{-1}	$(\eta_r-1)/\sqrt{c}$ / mol$^{-1/2}$ dm$^{3/2}$
c_{NA} = 0.020 mol dm^{-3}				
T = 298.15 K				
0.0200	0.9985	0.964	323.72	0.1728
0.0360	0.9987	0.987	324.53	0.2576
0.0520	0.9989	1.014	325.4	0.3402
0.0680	0.9991	1.034	326.57	0.3789
0.0840	0.9992	1.057	327.26	0.4253
0.1000	0.9994	1.088	327.85	0.4940
T = 308.15 K				
0.02	0.9957	0.796	321.53	0.1266
0.0359	0.9960	0.822	322.40	0.2699
0.0518	0.9962	0.847	323.27	0.3652
0.0678	0.9964	0.870	323.94	0.4322
0.0838	0.9966	0.890	324.68	0.4771
0.0997	0.9968	0.915	325.20	0.5386
T = 318.15 K				
0.0199	0.9916	0.653	317.30	0.2939
0.0358	0.9920	0.663	317.94	0.3034
0.0517	0.9923	0.675	318.56	0.3367
0.0676	0.9926	0.686	319.15	0.3619
0.0834	0.9930	0.696	319.80	0.3811
0.0994	0.9933	0.707	320.27	0.4047