Title of Manuscript:

Densities, Speeds of Sound, and Refractive Indices of Binary Mixtures of Decan-1-ol with Anisole, o-Cresol, m-Cresol and p-Cresol at *T* = (298.15, 303.15 and 308.15) K

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Supplementary information

Table 1 Values of Heat Capacity C_p at T = (298.15 to 308.15) K

	C_p / J·mol^{-1}·K^{-1}		
Components	T = 298.15 K	T = 303.15 K	T = 308.15 K
Decan-1-ol	373.10	380.40	385.40
Anisole	199.81	201.60	203.39
o-Cresol	229.75	232.98	236.52
m-Cresol	224.93	228.25	231.62
p-Cresol	221.03	224.23	227.44

Table 2 Isobaric Expansion Coefficients α of pure components at T = (298.15 to 308.15) K

	α / kK^{-1}		
Components	T = 298.15 K	T = 303.15 K	T = 308.15 K
Decan-1-ol	0.8287	0.8334	0.8369
Anisole	0.9527	0.9591	0.9638
o-Cresol	1.0319	1.0372	1.0452
m-Cresol	0.7679	0.7753	0.7784
p-Cresol	0.7514	0.7585	0.7614

Table 3. Isentropic Compressibilities κ_S, Molar Isentropic Compression $K_{S,m}$, Deviations in the speeds of sound Δu, Deviations in Isentropic Compressibilities $\Delta\kappa_S$, and Deviations in Molar Isentropic Compression $\Delta K_{S,m}$ for binary liquid mixtures at T = 298.15 to 308.15 K

x	κ_S / TPa^{-1}	$K_{S,m}$ / $m^3 \cdot PPa^{-1} \cdot mol^{-1}$	Δu / $m \cdot s^{-1}$	$\Delta\kappa_S$ / TPa^{-1}	$\Delta K_{S,m}$ / $m^3 \cdot PPa^{-1} \cdot mol^{-1}$
		T/K=298.15			
		x Anisole + (1- x) Decan-1-ol			
0.0000	635.88	121.772	0.00	0.000	0.000
0.0817	632.30	116.898	-2.11	2.238	0.470
0.1440	629.37	113.178	-3.85	4.053	0.826
0.2047	626.23	109.526	-5.57	5.821	1.153
0.2730	622.30	105.384	-7.51	7.769	1.487
0.3484	617.32	100.752	-9.57	9.788	1.802
0.4099	612.53	96.896	-10.99	11.144	1.988
0.4874	605.52	91.953	-12.49	12.497	2.139
0.5440	599.42	88.246	-13.11	12.993	2.159
0.6071	591.62	84.031	-13.38	13.099	2.103
0.6699	582.83	79.767	-13.29	12.817	1.985
0.7359	572.15	75.180	-12.53	11.872	1.768
0.8171	556.67	69.393	-10.40	9.610	1.362
0.9100	535.06	62.546	-5.72	5.174	0.699
0.9464	525.58	59.837	-3.42	3.105	0.416
1.0000	510.75	55.838	0.00	0.000	0.000
		x o-Cresol + (1- x) Decan-1-ol			
0.0000	635.88	121.772	0.00	0.000	0.000
0.0861	622.38	114.415	3.19	-3.243	-0.664
0.1516	612.12	108.977	5.14	-5.123	-1.013
0.2077	603.21	104.403	6.58	-6.418	-1.229
0.2717	592.92	99.284	7.83	-7.456	-1.375
0.3340	582.59	94.368	8.80	-8.173	-1.451
0.4103	569.19	88.394	9.92	-8.851	-1.491
0.4797	556.26	83.012	10.75	-9.222	-1.476
0.5545	541.38	77.255	11.40	-9.332	-1.409
0.6165	528.30	72.533	11.63	-9.123	-1.309
0.6875	512.23	67.158	11.57	-8.594	-1.159
0.7538	495.96	62.158	11.20	-7.857	-0.997
0.8245	477.24	56.867	10.03	-6.597	-0.783

0.8811	460.99	52.645	8.48	-5.275	-0.593
0.9410	442.42	48.200	5.96	-3.484	-0.371
1.0000	423.82	43.970	0.00	0.000	0.000
		x m-Cresol + (1- *x*) Decan-1-ol			
0.0000	635.88	121.772	0.00	0.000	0.000
0.0818	623.84	114.994	3.17	-3.168	-0.639
0.1443	614.60	109.937	5.23	-5.147	-1.008
0.2191	603.44	104.004	7.26	-7.007	-1.323
0.2700	595.60	100.018	8.52	-8.109	-1.491
0.3513	583.03	93.791	9.80	-9.118	-1.607
0.4154	572.58	88.933	10.67	-9.714	-1.651
0.4864	560.32	83.586	11.48	-10.154	-1.652
0.5447	549.65	79.231	12.05	-10.375	-1.624
0.6205	534.89	73.606	12.52	-10.353	-1.537
0.6951	519.27	68.124	12.62	-9.971	-1.399
0.7472	507.78	64.344	12.15	-9.280	-1.250
0.8163	491.35	59.344	11.21	-8.124	-1.032
0.8738	476.49	55.196	10.06	-6.932	-0.836
0.9325	460.47	51.017	7.74	-5.026	-0.572
1.0000	442.69	46.476	0.00	0.000	0.000
		x p-Cresol + (1- *x*) Decan-1-ol			
0.0000	635.88	121.772	0.00	0.000	0.000
0.0790	623.61	115.101	3.59	-3.569	-0.719
0.1424	613.91	109.904	5.90	-5.799	-1.137
0.2213	601.88	103.604	8.13	-7.847	-1.483
0.2915	590.81	98.090	9.87	-9.337	-1.702
0.3611	579.39	92.693	11.41	-10.541	-1.848
0.4180	569.81	88.350	12.30	-11.148	-1.892
0.4915	556.74	82.787	13.36	-11.733	-1.902
0.5566	544.55	77.914	14.00	-11.932	-1.855
0.6321	529.47	72.309	14.43	-11.815	-1.743
0.7041	514.06	67.022	14.40	-11.286	-1.579
0.7628	500.71	62.751	13.84	-10.432	-1.394
0.8229	486.27	58.434	12.59	-9.069	-1.153
0.8793	472.29	54.470	9.99	-6.895	-0.838
0.9382	456.17	50.308	7.03	-4.561	-0.523
1.0000	439.38	46.123	0.00	0.000	0.000
		T/K=303.15			
		x Anisole + (1- *x*) Decan-1-ol			
0.0000	654.60	125.878	0.00	0.000	0.000
0.0817	651.19	120.898	-2.21	2.440	0.515
0.1440	648.36	117.089	-3.99	4.379	0.897
0.2047	645.30	113.346	-5.73	6.254	1.245
0.2730	641.43	109.098	-7.69	8.314	1.600
0.3484	636.47	104.335	-9.71	10.394	1.925
0.4099	631.73	100.377	-11.17	11.853	2.127

0.4874	624.60	95.276	-12.54	13.146	2.265
0.5440	618.58	91.480	-13.29	13.789	2.304
0.6071	610.68	87.134	-13.52	13.863	2.238
0.6699	601.78	82.739	-13.42	13.559	2.112
0.7359	591.02	78.019	-12.73	12.632	1.890
0.8171	575.33	72.054	-10.67	10.312	1.467
0.9100	553.27	64.981	-5.99	5.648	0.763
0.9464	543.63	62.186	-3.75	3.522	0.469
1.0000	528.21	58.023	0.00	0.000	0.000
		x o-Cresol + (1- x) Decan-1-ol			
0.0000	654.60	125.878	0.00	0.000	0.000
0.0861	640.71	118.276	3.10	-3.317	-0.686
0.1516	630.18	112.661	4.95	-5.197	-1.041
0.2077	621.04	107.939	6.28	-6.474	-1.259
0.2717	610.44	102.646	7.47	-7.533	-1.413
0.3340	599.73	97.553	8.46	-8.321	-1.503
0.4103	585.88	91.368	9.56	-9.055	-1.555
0.4797	572.52	85.799	10.38	-9.464	-1.547
0.5545	557.21	79.852	10.96	-9.542	-1.474
0.6165	543.66	74.962	11.24	-9.385	-1.380
0.6875	526.94	69.389	11.37	-8.979	-1.240
0.7538	510.20	64.228	10.96	-8.186	-1.066
0.8245	490.94	58.768	9.81	-6.855	-0.835
0.8811	474.23	54.416	8.24	-5.433	-0.626
0.9410	455.08	49.826	5.83	-3.594	-0.390
1.0000	435.90	45.459	0.00	0.000	0.000
		x m-Cresol + (1- x) Decan-1-ol			
0.0000	654.60	125.878	0.00	0.000	0.000
0.0818	642.13	118.857	3.12	-3.242	-0.656
0.1443	632.62	113.629	5.07	-5.205	-1.024
0.2191	621.06	107.483	7.05	-7.098	-1.346
0.2700	613.06	103.374	8.15	-8.095	-1.497
0.3513	599.81	96.888	9.63	-9.319	-1.648
0.4154	588.93	91.849	10.52	-9.957	-1.697
0.4864	576.18	86.303	11.36	-10.439	-1.703
0.5447	565.19	81.802	11.81	-10.572	-1.661
0.6205	549.90	75.978	12.22	-10.506	-1.565
0.6951	533.72	70.302	12.26	-10.067	-1.417
0.7472	521.71	66.373	11.91	-9.443	-1.276
0.8163	504.55	61.180	11.10	-8.343	-1.063
0.8738	489.23	56.894	9.80	-7.008	-0.848
0.9325	472.54	52.559	7.56	-5.093	-0.581
1.0000	453.97	47.844	0.00	0.000	0.000
		x p-Cresol + (1- x) Decan-1-ol			
0.0000	654.60	125.878	0.00	0.000	0.000
0.0790	641.98	118.984	3.45	-3.573	-0.723

0.1424	631.95	113.602	5.70	-5.834	-1.148
0.2213	619.44	107.068	7.92	-7.964	-1.510
0.2915	607.89	101.341	9.71	-9.555	-1.746
0.3611	596.19	95.774	11.04	-10.629	-1.871
0.4180	586.15	91.255	12.04	-11.350	-1.933
0.4915	572.59	85.489	13.07	-11.937	-1.943
0.5566	559.99	80.446	13.61	-12.072	-1.884
0.6321	544.28	74.628	14.09	-12.000	-1.777
0.7041	528.31	69.151	14.02	-11.427	-1.605
0.7628	514.52	64.736	13.33	-10.452	-1.404
0.8229	499.48	60.256	12.14	-9.085	-1.161
0.8793	484.72	56.119	9.89	-7.079	-0.864
0.9382	468.12	51.822	6.73	-4.535	-0.522
1.0000	450.49	47.469	0.00	0.000	0.000
T/K=308.15					
x Anisole + (1- *x*) Decan-1-ol					
0.0000	673.82	130.116	0.00	0.000	0.000
0.0817	670.72	125.056	-2.40	2.777	0.589
0.1440	668.00	121.158	-4.22	4.849	0.999
0.2047	664.97	117.312	-5.94	6.782	1.359
0.2730	661.16	112.947	-7.88	8.920	1.728
0.3484	656.25	108.056	-9.91	11.097	2.067
0.4099	651.57	103.993	-11.39	12.642	2.281
0.4874	644.45	98.749	-12.76	13.999	2.425
0.5440	638.35	94.833	-13.42	14.590	2.453
0.6071	630.48	90.373	-13.72	14.743	2.394
0.6699	621.51	85.850	-13.62	14.428	2.260
0.7359	610.67	80.993	-12.96	13.493	2.031
0.8171	594.72	74.838	-10.85	11.012	1.577
0.9100	572.34	67.545	-6.23	6.165	0.837
0.9464	562.46	64.650	-3.91	3.854	0.515
1.0000	546.60	60.333	0.00	0.000	0.000
x o-Cresol + (1- *x*) Decan-1-ol					
0.0000	673.82	130.116	0.00	0.000	0.000
0.0861	659.54	122.261	2.98	-3.366	-0.707
0.1516	648.69	116.455	4.77	-5.298	-1.077
0.2077	639.27	111.575	6.06	-6.603	-1.304
0.2717	628.24	106.083	7.32	-7.799	-1.485
0.3340	617.22	100.821	8.26	-8.590	-1.577
0.4103	603.09	94.452	9.15	-9.191	-1.608
0.4797	589.43	88.712	9.80	-9.497	-1.584
0.5545	573.54	82.547	10.47	-9.689	-1.529
0.6165	559.46	77.476	10.86	-9.637	-1.447
0.6875	542.15	71.706	11.07	-9.297	-1.315
0.7538	524.83	66.365	10.74	-8.550	-1.143
0.8245	505.11	60.739	9.42	-7.052	-0.886

0.8811	487.83	56.238	7.98	-5.651	-0.674
0.9410	468.19	51.511	5.55	-3.679	-0.414
1.0000	448.42	47.008	0.00	0.000	0.000
		x m-Cresol + (1- *x*) Decan-1-ol			
0.0000	673.82	130.116	0.00	0.000	0.000
0.0818	660.99	122.860	2.99	-3.247	-0.661
0.1443	651.07	117.431	5.00	-5.341	-1.055
0.2191	639.21	111.084	6.84	-7.171	-1.366
0.2700	630.83	106.813	8.01	-8.278	-1.536
0.3513	617.21	100.111	9.35	-9.427	-1.674
0.4154	606.00	94.900	10.16	-10.014	-1.715
0.4864	592.78	89.155	10.96	-10.493	-1.719
0.5447	581.37	84.490	11.41	-10.633	-1.677
0.6205	565.52	78.455	11.79	-10.549	-1.578
0.6951	548.66	72.563	11.91	-10.165	-1.436
0.7472	536.04	68.471	11.74	-9.666	-1.310
0.8163	518.26	63.094	10.89	-8.491	-1.085
0.8738	502.40	58.658	9.52	-7.068	-0.858
0.9325	484.99	54.156	7.39	-5.159	-0.591
1.0000	465.59	49.259	0.00	0.000	0.000
		x p-Cresol + (1- *x*) Decan-1-ol			
0.0000	673.82	130.116	0.00	0.000	0.000
0.0790	660.88	122.998	3.29	-3.556	-0.723
0.1424	650.42	117.410	5.59	-5.951	-1.174
0.2213	637.53	110.653	7.72	-8.074	-1.536
0.2915	625.67	104.738	9.37	-9.603	-1.762
0.3611	613.46	98.956	10.78	-10.788	-1.904
0.4180	603.06	94.277	11.75	-11.509	-1.965
0.4915	589.16	88.323	12.59	-11.962	-1.953
0.5566	576.05	83.092	13.16	-12.130	-1.899
0.6321	559.64	77.047	13.75	-12.158	-1.805
0.7041	543.03	71.365	13.72	-11.602	-1.633
0.7628	528.59	66.772	13.19	-10.717	-1.441
0.8229	513.10	62.143	11.81	-9.177	-1.176
0.8793	497.82	57.861	9.50	-7.061	-0.865
0.9382	480.18	53.362	6.91	-4.819	-0.556
1.0000	461.99	48.866	0.00	0.000	0.000

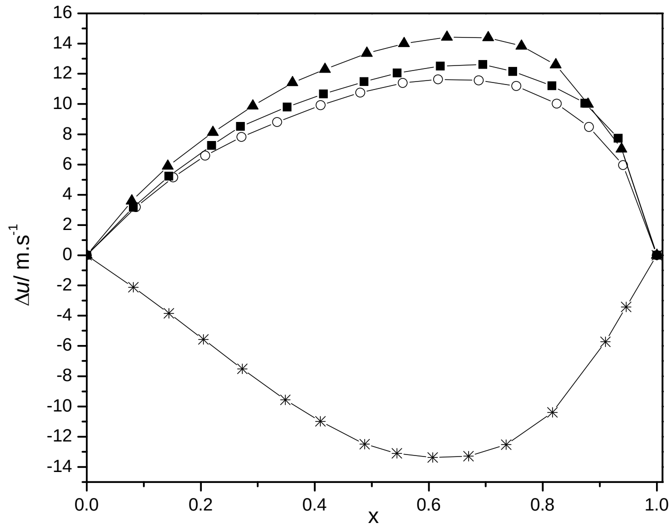

Figure 1. Deviations in speeds of sound, Δu/m.s^{-1}, plotted against mole fraction, x, at T = 298.15 K for binary mixtures of decan-1-ol with: ○, o-cresol; ■, m-cresol; ▲, p-cresol; and $*$ anisole. Solid curves have been derived using Redlich-Kister equation

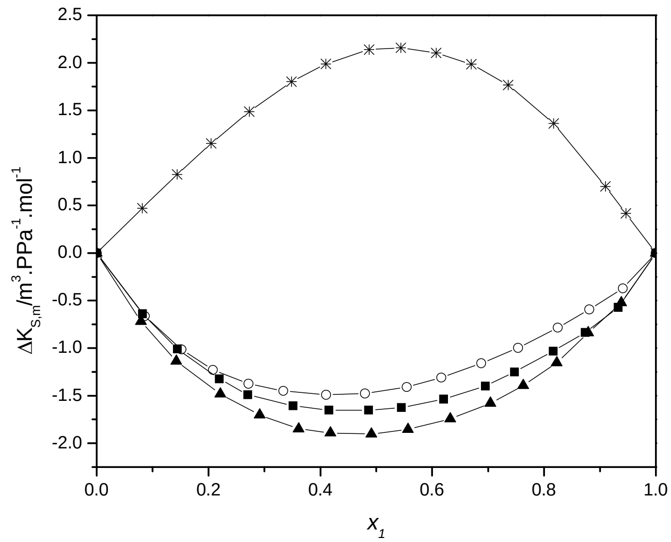

Figure 2. Deviations in molar isentropic compressibility, $\Delta K_{S,m}$/ $m^3.PPa^{-1}.mol^{-1}$, plotted against mole fraction, x, at T = 298.15 K for binary mixtures of decan-1-ol with: ○, o-cresol; ■, m-cresol; ▲, p-cresol; and * anisole. Solid curves have been derived using Redlich-Kister equation.