

Correlation of Experimental Liquid–Liquid Equilibrium Data for Ternary Systems Using NRTL and GMDH-Type Neural Network

Sezin Bekri,[†] Dilek Özmen,[†] and Atilla Özmen[‡]

[†] Faculty of Engineering, Chemical Engineering Department, Istanbul University, 34320 Istanbul, Turkey

[‡] Faculty of Engineering and Natural Sciences, Electrical-Electronics Engineering Department, Kadir Has University, 34083 Istanbul, Turkey

Experimental solubility curve data in mole fraction for water (1) + propionic acid (2) + solvent (3) ternary systems at $T = 298.15$ K and $P = 101.3$ kPa^a.

<i>Water (1) + propionic acid (2) + cyclopentane (3)</i>		<i>Water (1) + propionic acid (2) + cyclopentanol (3)</i>	
x_1	x_2	x_1	x_2
0.9999	0.0000	0.9835	0.0000
0.9687	0.0294	0.9462	0.0280
0.9367	0.0606	0.8850	0.0577
0.8939	0.1003	0.8695	0.0664
0.8447	0.1486	0.8309	0.0794
0.6838	0.2984	0.8034	0.0882
0.5907	0.3704	0.7792	0.0973
0.4718	0.4449	0.7420	0.1078
0.3668	0.4810	0.7037	0.1165
0.2446	0.4975	0.6560	0.1143
0.0424	0.3727	0.5870	0.0942
0.0341	0.3381	0.5458	0.0571
0.0217	0.2253	0.4860	0.0000
0.0086	0.0969	-	-
0.0038	0.0000	-	-
<i>Water (1) + propionic acid (2) + 2-octanone (3)</i>		<i>Water (1) + propionic acid (2) + dibutyl maleate (3)</i>	
x_1	x_2	x_1	x_2
0.9998	0.0000	1.0000	0.0000
0.9711	0.0286	0.9725	0.0275
0.9367	0.0627	0.9389	0.0610
0.8939	0.1019	0.8992	0.1007
0.8383	0.1465	0.8461	0.1498
0.7875	0.1828	0.7850	0.1988
0.7158	0.2303	0.6557	0.2929
0.6264	0.2837	0.6313	0.3087

0.5185	0.3315	0.4705	0.3874
0.4218	0.3523	0.4349	0.3866
0.3774	0.3388	0.3178	0.3960
0.3280	0.2954	0.0739	0.4107
0.2344	0.2472	0.0195	0.2579
0.1491	0.1430	0.0175	0.0000
0.0827	0.0000	-	-

^a Standard uncertainties u are $u(x) = 0.005$, $u(T) = 0.2$ K, and $u(P) = 0.7$ kPa