**Supplementary Material for**

Thermodynamic and thermal analyze of *N,N*-dimethylformamide + 1-butanol mixture properties based on density, sound velocity and heat capacity data

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**Table S1.** Experimental values of density, *ρ*, of (DMF + BuOH) mixtures at different temperature at pressure *p* = 0.1002 ± 0.005 MPa.a

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *ρ*/ kg·m−3 | | | | | |
|  | 293.15 K | 298.15 K | 303.15 K | 308.15 K | 313.15 K | 318.15 K |
| 0.0000 | 809.55 | 805.74 | 801.90 | 798.03 | 794.13 | 790.18 |
| 0.0500 | 815.47 | 811.59 | 807.69 | 803.76 | 799.79 | 795.79 |
| 0.1000 | 821.43 | 817.49 | 813.52 | 809.53 | 805.51 | 801.46 |
| 0.1500 | 827.50 | 823.49 | 819.46 | 815.41 | 811.34 | 807.24 |
| 0.1999 | 833.67 | 829.61 | 825.53 | 821.43 | 817.30 | 813.15 |
| 0.2499 | 839.94 | 835.84 | 831.71 | 827.55 | 823.38 | 819.19 |
| 0.3000 | 846.34 | 842.18 | 838.00 | 833.80 | 829.58 | 825.34 |
| 0.3499 | 852.85 | 848.65 | 844.42 | 840.18 | 835.92 | 831.63 |
| 0.4000 | 859.49 | 855.25 | 850.97 | 846.68 | 842.37 | 838.04 |
| 0.4500 | 866.25 | 861.96 | 857.64 | 853.30 | 848.94 | 844.57 |
| 0.5000 | 873.12 | 868.78 | 864.41 | 860.03 | 855.63 | 851.22 |
| 0.5500 | 880.10 | 875.72 | 871.31 | 866.88 | 862.45 | 857.99 |
| 0.6000 | 887.21 | 882.79 | 878.33 | 873.86 | 869.37 | 864.88 |
| 0.6500 | 894.45 | 889.98 | 885.47 | 880.96 | 876.43 | 871.89 |
| 0.7001 | 901.82 | 897.29 | 892.75 | 888.19 | 883.63 | 879.05 |
| 0.7500 | 909.31 | 904.75 | 900.16 | 895.57 | 890.96 | 886.35 |
| 0.8000 | 916.96 | 912.35 | 907.72 | 903.09 | 898.45 | 893.79 |
| 0.8500 | 924.73 | 920.07 | 915.41 | 910.74 | 906.05 | 901.36 |
| 0.8999 | 932.64 | 927.95 | 923.24 | 918.53 | 913.81 | 909.08 |
| 0.9500 | 940.67 | 935.95 | 931.21 | 926.46 | 921.70 | 916.93 |
| 1.0000 | 948.69 | 943.92 | 939.14 | 934.36 | 929.56 | 924.76 |

a Standard uncertainties *u* are *u*(*T*) = 0.01 K, *u*(*p*) = 0.005 MPa, and the combined expanded uncertainty *U*c is *U*c(*ρ*) = 2·10−2 kg·m−3 *U*c () = 5·10−5 with 0.95 level of confidence (*k* ≈ 2).

**Table S2.** Experimental values of sound velocity, *u*, for (DMF+BuOH) mixtures at different temperature at pressure *p* = 0.1002 ± 0.005 MPa.a

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *u*/ m·s−1 | | | | | |
|  | 293.15 K | 298.15 K | 303.15 K | 308.15 K | 313.15 K | 318.15 K |
| 0.0000 | 1256.4 | 1239.5 | 1222.7 | 1206.0 | 1189.4 | 1173.2 |
| 0.0500 | 1266.9 | 1249.7 | 1232.7 | 1215.8 | 1199.1 | 1182.6 |
| 0.1000 | 1277.0 | 1259.7 | 1242.5 | 1225.5 | 1208.6 | 1191.9 |
| 0.1500 | 1287.0 | 1269.6 | 1252.2 | 1235.0 | 1218.0 | 1201.3 |
| 0.1999 | 1297.3 | 1279.7 | 1262.3 | 1244.9 | 1227.7 | 1210.7 |
| 0.2499 | 1307.2 | 1289.5 | 1271.9 | 1254.5 | 1237.1 | 1220.1 |
| 0.3000 | 1317.4 | 1299.6 | 1281.9 | 1264.3 | 1246.8 | 1229.6 |
| 0.3499 | 1327.9 | 1309.9 | 1292.0 | 1274.3 | 1256.7 | 1239.4 |
| 0.4000 | 1338.5 | 1320.4 | 1302.4 | 1284.5 | 1266.8 | 1249.3 |
| 0.4500 | 1349.4 | 1331.2 | 1313.1 | 1295.1 | 1277.1 | 1259.4 |
| 0.5000 | 1360.3 | 1341.8 | 1323.5 | 1305.4 | 1287.4 | 1269.5 |
| 0.5500 | 1370.9 | 1352.4 | 1334.0 | 1315.7 | 1297.6 | 1279.7 |
| 0.6000 | 1382.1 | 1363.4 | 1344.9 | 1326.5 | 1308.2 | 1290.2 |
| 0.6500 | 1393.4 | 1374.6 | 1356.0 | 1337.4 | 1319.0 | 1300.9 |
| 0.7001 | 1405.0 | 1386.0 | 1367.2 | 1348.6 | 1330.0 | 1311.7 |
| 0.7500 | 1416.8 | 1397.8 | 1378.8 | 1360.0 | 1341.3 | 1322.8 |
| 0.8000 | 1428.7 | 1409.5 | 1390.4 | 1371.5 | 1352.7 | 1334.1 |
| 0.8500 | 1440.7 | 1421.5 | 1402.3 | 1383.2 | 1364.2 | 1345.6 |
| 0.8999 | 1453.0 | 1433.6 | 1414.3 | 1395.1 | 1376.1 | 1357.3 |
| 0.9500 | 1465.5 | 1446.0 | 1426.7 | 1407.4 | 1388.1 | 1369.1 |

a Standard uncertainties *u* are *u*(*T*) = 0.01 K, *u*(*p*) = 0.005 MPa, and the combined expanded uncertainty *U*c is *U*c(*u*) = 0.5 m·s−1, *U*c () = 5·10−5 with 0.95 level of confidence (*k* ≈ 2).

**Table S3.** Experimental values of specific heat capacity, , of (DMF + BuOH) mixtures at different temperature at pressure *p* = 0.1002 ± 0.005 MPa. a

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | / J·g−1·K−1 | | | | | |
| 293.15 K | 298.15 K | 303.15 K | 308.15 K | 313.15 K | 318.15 K |
| 0.0000 | 2.378 | 2.419 | 2.465 | 2.514 | 2.564 | 2.616 |
| 0.0500 | 2.359 | 2.396 | 2.439 | 2.484 | 2.530 | 2.577 |
| 0.1000 | 2.338 | 2.373 | 2.413 | 2.454 | 2.497 | 2.540 |
| 0.1500 | 2.319 | 2.352 | 2.388 | 2.425 | 2.464 | 2.503 |
| 0.1999 | 2.299 | 2.330 | 2.363 | 2.397 | 2.433 | 2.470 |
| 0.2499 | 2.279 | 2.308 | 2.338 | 2.370 | 2.403 | 2.437 |
| 0.3000 | 2.260 | 2.286 | 2.315 | 2.344 | 2.374 | 2.405 |
| 0.3499 | 2.241 | 2.265 | 2.291 | 2.318 | 2.347 | 2.374 |
| 0.4000 | 2.222 | 2.244 | 2.268 | 2.293 | 2.318 | 2.345 |
| 0.4500 | 2.204 | 2.224 | 2.245 | 2.268 | 2.292 | 2.317 |
| 0.5000 | 2.185 | 2.203 | 2.224 | 2.244 | 2.266 | 2.289 |
| 0.5500 | 2.168 | 2.184 | 2.203 | 2.222 | 2.242 | 2.264 |
| 0.6000 | 2.150 | 2.166 | 2.183 | 2.201 | 2.220 | 2.238 |
| 0.6500 | 2.133 | 2.147 | 2.163 | 2.179 | 2.196 | 2.215 |
| 0.7001 | 2.116 | 2.131 | 2.145 | 2.160 | 2.175 | 2.192 |
| 0.7500 | 2.100 | 2.113 | 2.126 | 2.140 | 2.155 | 2.168 |
| 0.8000 | 2.085 | 2.097 | 2.109 | 2.121 | 2.135 | 2.149 |
| 0.8500 | 2.070 | 2.081 | 2.091 | 2.103 | 2.115 | 2.127 |
| 0.8999 | 2.056 | 2.066 | 2.076 | 2.086 | 2.097 | 2.109 |
| 0.9500 | 2.043 | 2.051 | 2.060 | 2.070 | 2.080 | 2.090 |
| 1.0000 | 2.029 | 2.038 | 2.046 | 2.055 | 2.064 | 2.073 |

a Standard uncertainties *u* are *u*(*T*) = 0.01 K, *u*(*p*) = 0.005 MPa, and the combined expanded uncertainty *U*c is *U*c (*cp*) = 0.0025 J·g−1·K−1, *U*c () = 5·10−5 with 0.95 level of confidence (*k* ≈ 2).

**Table S4.** Partial molar volume of DMF, , for (DMF + BuOH) mixtures at different temperature at pressure *p* = 0.1002 ± 0.005 MPa.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | ·105/ m3·mol−1 | | | | | |
| 293.15 K | 298.15 K | 303.15 K | 308.15 K | 313.15 K | 318.15 K |
| 0.0000 | 7.7060 | 7.7484 | 7.7919 | 7.8357 | 7.8797 | 7.9239 |
| 0.0500 | 7.7054 | 7.7476 | 7.7908 | 7.8343 | 7.8780 | 7.9219 |
| 0.1000 | 7.7055 | 7.7475 | 7.7903 | 7.8335 | 7.8770 | 7.9206 |
| 0.1500 | 7.7055 | 7.7473 | 7.7899 | 7.8327 | 7.8759 | 7.9193 |
| 0.1999 | 7.7055 | 7.7470 | 7.7891 | 7.8317 | 7.8745 | 7.9177 |
| 0.2499 | 7.7055 | 7.7466 | 7.7884 | 7.8306 | 7.8732 | 7.9160 |
| 0.3000 | 7.7053 | 7.7461 | 7.7877 | 7.8295 | 7.8718 | 7.9143 |
| 0.3499 | 7.7051 | 7.7456 | 7.7868 | 7.8283 | 7.8702 | 7.9125 |
| 0.4000 | 7.7047 | 7.7449 | 7.7858 | 7.8271 | 7.8688 | 7.9108 |
| 0.4500 | 7.7043 | 7.7443 | 7.7849 | 7.8259 | 7.8674 | 7.9092 |
| 0.5000 | 7.7040 | 7.7438 | 7.7841 | 7.8249 | 7.8662 | 7.9078 |
| 0.5500 | 7.7038 | 7.7433 | 7.7834 | 7.8240 | 7.8650 | 7.9065 |
| 0.6000 | 7.7036 | 7.7430 | 7.7829 | 7.8233 | 7.8642 | 7.9055 |
| 0.6500 | 7.7034 | 7.7426 | 7.7824 | 7.8227 | 7.8634 | 7.9046 |
| 0.7001 | 7.7032 | 7.7424 | 7.7820 | 7.8221 | 7.8627 | 7.9037 |
| 0.7500 | 7.7031 | 7.7421 | 7.7817 | 7.8216 | 7.8621 | 7.9030 |
| 0.8000 | 7.7028 | 7.7419 | 7.7813 | 7.8212 | 7.8616 | 7.9024 |
| 0.8500 | 7.7029 | 7.7418 | 7.7812 | 7.8210 | 7.8614 | 7.9022 |
| 0.8999 | 7.7029 | 7.7418 | 7.7811 | 7.8210 | 7.8613 | 7.9021 |
| 0.9500 | 7.7031 | 7.7420 | 7.7813 | 7.8212 | 7.8615 | 7.9023 |
| 1.0000 | 7.7048 | 7.7437 | 7.7831 | 7.8230 | 7.8634 | 7.9042 |

– molar fraction of *N,N*-dimethyloformamide; The uncertainty of the mole fraction *x*W is equal ±5·10−5.

**Table S5.** Partial molar volume of BuOH, for (DMF + BuOH) mixtures at different temperature at pressure *p* = 0.1002 ± 0.005 MPa.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | ·105/ m3·mol−1 | | | | | |
| 293.15 K | 298.15 K | 303.15 K | 308.15 K | 313.15 K | 318.15 K |
| 0.0000 | 9.1559 | 9.1992 | 9.2432 | 9.2881 | 9.3337 | 9.3803 |
| 0.0500 | 9.1556 | 9.1991 | 9.2433 | 9.2882 | 9.3340 | 9.3807 |
| 0.1000 | 9.1560 | 9.1997 | 9.2439 | 9.2890 | 9.3349 | 9.3816 |
| 0.1500 | 9.1564 | 9.2001 | 9.2446 | 9.2898 | 9.3357 | 9.3825 |
| 0.1999 | 9.1566 | 9.2005 | 9.2450 | 9.2902 | 9.3363 | 9.3832 |
| 0.2499 | 9.1569 | 9.2008 | 9.2454 | 9.2907 | 9.3368 | 9.3838 |
| 0.3000 | 9.1571 | 9.2010 | 9.2457 | 9.2911 | 9.3373 | 9.3844 |
| 0.3499 | 9.1571 | 9.2012 | 9.2459 | 9.2914 | 9.3377 | 9.3849 |
| 0.4000 | 9.1570 | 9.2012 | 9.2461 | 9.2918 | 9.3382 | 9.3855 |
| 0.4500 | 9.1570 | 9.2013 | 9.2463 | 9.2922 | 9.3387 | 9.3862 |
| 0.5000 | 9.1570 | 9.2014 | 9.2467 | 9.2927 | 9.3394 | 9.3870 |
| 0.5500 | 9.1570 | 9.2016 | 9.2471 | 9.2933 | 9.3402 | 9.3880 |
| 0.6000 | 9.1571 | 9.2019 | 9.2477 | 9.2941 | 9.3413 | 9.3892 |
| 0.6500 | 9.1573 | 9.2023 | 9.2483 | 9.2950 | 9.3425 | 9.3906 |
| 0.7001 | 9.1573 | 9.2027 | 9.2490 | 9.2960 | 9.3436 | 9.3921 |
| 0.7500 | 9.1575 | 9.2032 | 9.2498 | 9.2971 | 9.3450 | 9.3936 |
| 0.8000 | 9.1576 | 9.2036 | 9.2506 | 9.2982 | 9.3464 | 9.3953 |
| 0.8500 | 9.1579 | 9.2042 | 9.2516 | 9.2995 | 9.3481 | 9.3974 |
| 0.8999 | 9.1582 | 9.2049 | 9.2526 | 9.3010 | 9.3499 | 9.3995 |
| 0.9500 | 9.1588 | 9.2058 | 9.2540 | 9.3027 | 9.3521 | 9.4020 |
| 1.0000 | 9.1608 | 9.2082 | 9.2569 | 9.3061 | 9.3559 | 9.4062 |

– molar fraction of *N,N*-dimethyloformamide; The uncertainty of the mole fraction *x*W is equal ±5·10−5.

**Table S6.** Excess partial molar volume of DMF, , for (DMF + BuOH) mixtures at different temperature at pressure *p* = 0.1002 ± 0.005 MPa.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | ·108/ m3·mol−1 | | | | | |
| 293.15 K | 298.15 K | 303.15 K | 308.15 K | 313.15 K | 318.15 K |
| 0.0000 | 1.1370 | 4.6450 | 8.7737 | 12.6707 | 16.3428 | 19.6857 |
| 0.0500 | 0.5812 | 3.8700 | 7.6816 | 11.2658 | 14.6509 | 17.7408 |
| 0.1000 | 0.6986 | 3.7386 | 7.2201 | 10.5102 | 13.6136 | 16.4067 |
| 0.1500 | 0.7072 | 3.5512 | 6.7843 | 9.7607 | 12.5488 | 15.0771 |
| 0.1999 | 0.6915 | 3.2201 | 6.0229 | 8.6864 | 11.1805 | 13.4505 |
| 0.2499 | 0.6481 | 2.8437 | 5.3016 | 7.6363 | 9.8176 | 11.8066 |
| 0.3000 | 0.5131 | 2.3909 | 4.5548 | 6.5358 | 8.4086 | 10.1278 |
| 0.3499 | 0.2579 | 1.8336 | 3.6395 | 5.2745 | 6.8640 | 8.3462 |
| 0.4000 | -0.1231 | 1.1868 | 2.6776 | 4.0999 | 5.4446 | 6.6195 |
| 0.4500 | -0.4864 | 0.5752 | 1.7744 | 2.9519 | 4.0280 | 5.0252 |
| 0.5000 | -0.7838 | 0.0581 | 1.0103 | 1.9247 | 2.8125 | 3.5963 |
| 0.5500 | -1.0260 | -0.4136 | 0.3161 | 1.0293 | 1.6784 | 2.3048 |
| 0.6000 | -1.2408 | -0.7905 | -0.2101 | 0.3156 | 0.8163 | 1.2634 |
| 0.6500 | -1.4166 | -1.1366 | -0.7191 | -0.3299 | 0.0707 | 0.3756 |
| 0.7001 | -1.6586 | -1.3739 | -1.0926 | -0.8723 | -0.6838 | -0.4666 |
| 0.7500 | -1.7536 | -1.5990 | -1.4546 | -1.3508 | -1.2578 | -1.1572 |
| 0.8000 | -1.9895 | -1.8652 | -1.8215 | -1.7919 | -1.7821 | -1.7518 |
| 0.8500 | -1.9570 | -1.9097 | -1.9187 | -1.9450 | -1.9665 | -1.9852 |
| 0.8999 | -1.9639 | -1.9454 | -1.9876 | -2.0355 | -2.0835 | -2.1141 |
| 0.9500 | -1.6920 | -1.7271 | -1.7791 | -1.8286 | -1.8598 | -1.8978 |
| 1.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

– molar fraction of *N,N*-dimethyloformamide; The uncertainty of the mole fraction *x*W is equal ±5·10−5.

**Table S7.** Excess partial molar volume of BuOH, for (DMF + BuOH) mixtures at different temperature at pressure *p* = 0.1002 ± 0.005 MPa.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | ·108/ m3·mol−1 | | | | | |
| 293.15 K | 298.15 K | 303.15 K | 308.15 K | 313.15 K | 318.15 K |
| 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 0.0500 | -0.2535 | -0.0940 | 0.0279 | 0.1291 | 0.2320 | 0.3330 |
| 0.1000 | 0.1661 | 0.4555 | 0.6864 | 0.9076 | 1.1186 | 1.2767 |
| 0.1500 | 0.4769 | 0.9490 | 1.3707 | 1.6921 | 1.9778 | 2.2249 |
| 0.1999 | 0.7634 | 1.2988 | 1.7294 | 2.1519 | 2.5334 | 2.8761 |
| 0.2499 | 1.0222 | 1.6034 | 2.1280 | 2.6358 | 3.0945 | 3.5100 |
| 0.3000 | 1.1894 | 1.8316 | 2.5013 | 3.0694 | 3.6094 | 4.1091 |
| 0.3499 | 1.2365 | 1.9551 | 2.7061 | 3.3421 | 3.9887 | 4.6053 |
| 0.4000 | 1.1578 | 1.9893 | 2.8641 | 3.7015 | 4.4933 | 5.1564 |
| 0.4500 | 1.0966 | 2.0586 | 3.0810 | 4.0875 | 5.0006 | 5.8400 |
| 0.5000 | 1.1015 | 2.2224 | 3.4370 | 4.5944 | 5.7091 | 6.6889 |
| 0.5500 | 1.1615 | 2.4317 | 3.8628 | 5.2331 | 6.4989 | 7.6752 |
| 0.6000 | 1.2489 | 2.7358 | 4.4566 | 6.0533 | 7.5608 | 8.9117 |
| 0.6500 | 1.3754 | 3.0706 | 5.0676 | 6.9419 | 8.7391 | 10.3017 |
| 0.7001 | 1.4356 | 3.5142 | 5.8142 | 7.9336 | 9.9085 | 11.7373 |
| 0.7500 | 1.6429 | 3.9701 | 6.5722 | 8.9891 | 11.2584 | 13.3245 |
| 0.8000 | 1.7091 | 4.3848 | 7.3254 | 10.0820 | 12.6581 | 15.0077 |
| 0.8500 | 2.0438 | 5.0212 | 8.3482 | 11.4629 | 14.3976 | 17.0522 |
| 0.8999 | 2.3392 | 5.6664 | 9.3993 | 12.9065 | 16.2046 | 19.2011 |
| 0.9500 | 2.9133 | 6.5657 | 10.7278 | 14.6474 | 18.3522 | 21.6952 |
| 1.0000 | 4.9075 | 8.9737 | 13.6270 | 18.0100 | 22.1360 | 25.8708 |

– molar fraction of *N,N*-dimethyloformamide; The uncertainty of the mole fraction *x*W is equal ±5·10−5.

**Table S8.** The values of isentropic (**s) and isothermal (**T) compressibility coefficients for (DMF + BuOH) mixtures at different temperature at pressure *p* = 0.1002 ± 0.005 MPa.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (Pa−1) | | | | | | | | | | | |
|  | 293.15 K | | 298.15 K | | 303.15 K | | 308.15 K | | 313.15 K | | 318.15 K | |
|  | *κ*s·1010 | *κ*T·1010 | *κ*s·1010 | *κ*T·1010 | *κ*s·1010 | *κ*T·1010 | *κ*s·1010 | *κ*T·1010 | *κ*s·1010 | *κ*T·1010 | *κ*s·1010 | *κ*T·1010 |
| 0.0000 | 7.8249 | 9.1582 | 8.0784 | 9.4562 | 8.3417 | 9.7617 | 8.6156 | 10.0762 | 8.9007 | 10.0762 | 9.1945 | 10.7347 |
| 0.0500 | 7.6408 | 9.0043 | 7.8895 | 9.2977 | 8.1479 | 9.5986 | 8.4167 | 9.9087 | 8.6966 | 9.9087 | 8.9856 | 10.5589 |
| 0.1000 | 7.4648 | 8.8565 | 7.7085 | 9.1452 | 7.9620 | 9.4410 | 8.2255 | 9.7462 | 8.4996 | 9.7462 | 8.7828 | 10.3857 |
| 0.1500 | 7.2957 | 8.7174 | 7.5342 | 8.9993 | 7.7824 | 9.2889 | 8.0405 | 9.5883 | 8.3088 | 9.5883 | 8.5847 | 10.2136 |
| 0.1999 | 7.1271 | 8.5649 | 7.3601 | 8.8432 | 7.6026 | 9.1295 | 7.8550 | 9.4257 | 8.1178 | 9.4257 | 8.3903 | 10.0466 |
| 0.2499 | 6.9669 | 8.4213 | 7.1948 | 8.6954 | 7.4320 | 8.9782 | 7.6787 | 9.2695 | 7.9354 | 9.2695 | 8.2009 | 9.8801 |
| 0.3000 | 6.8076 | 8.2775 | 7.0303 | 8.5469 | 7.2622 | 8.8248 | 7.5033 | 9.1113 | 7.7542 | 9.1113 | 8.0138 | 9.7121 |
| 0.3499 | 6.6500 | 8.1302 | 6.8676 | 8.3960 | 7.0942 | 8.6704 | 7.3295 | 8.9528 | 7.5748 | 8.9528 | 7.8284 | 9.5460 |
| 0.4000 | 6.4943 | 7.9884 | 6.7067 | 8.2496 | 6.9279 | 8.5188 | 7.1579 | 8.7962 | 7.3978 | 8.7962 | 7.6459 | 9.3797 |
| 0.4500 | 6.3397 | 7.8434 | 6.5469 | 8.1007 | 6.7629 | 8.3661 | 6.9875 | 8.6399 | 7.2219 | 8.6399 | 7.4654 | 9.2154 |
| 0.5000 | 6.1900 | 7.7032 | 6.3933 | 7.9573 | 6.6045 | 8.2184 | 6.8235 | 8.4877 | 7.0521 | 8.4877 | 7.2896 | 9.0531 |
| 0.5500 | 6.0462 | 7.5661 | 6.2437 | 7.8154 | 6.4495 | 8.0718 | 6.6639 | 8.3374 | 6.8865 | 8.3374 | 7.1168 | 8.8915 |
| 0.6000 | 5.9009 | 7.4306 | 6.0938 | 7.6747 | 6.2946 | 7.9260 | 6.5037 | 8.1861 | 6.7212 | 8.1861 | 6.9462 | 8.7305 |
| 0.6500 | 5.7582 | 7.2933 | 5.9465 | 7.5336 | 6.1424 | 7.7813 | 6.3462 | 8.0374 | 6.5585 | 8.0374 | 6.7776 | 8.5719 |
| 0.7001 | 5.6175 | 7.1622 | 5.8012 | 7.3951 | 5.9922 | 7.6361 | 6.1909 | 7.8848 | 6.3976 | 7.8848 | 6.6116 | 8.4053 |
| 0.7500 | 5.4784 | 7.0240 | 5.6573 | 7.2530 | 5.8435 | 7.4897 | 6.0372 | 7.7341 | 6.2390 | 7.7341 | 6.4476 | 8.2464 |
| 0.8000 | 5.3428 | 6.8909 | 5.5169 | 7.1146 | 5.6983 | 7.3464 | 5.8869 | 7.5862 | 6.0830 | 7.5862 | 6.2858 | 8.0851 |
| 0.8500 | 5.2097 | 6.7574 | 5.3792 | 6.9769 | 5.5556 | 7.2048 | 5.7391 | 7.4383 | 5.9303 | 7.4383 | 6.1277 | 7.9292 |
| 0.8999 | 5.0789 | 6.6230 | 5.2436 | 6.8382 | 5.4150 | 7.0607 | 5.5936 | 7.2906 | 5.7793 | 7.2906 | 5.9714 | 7.7715 |
| 0.9500 | 4.9498 | 6.4868 | 5.1097 | 6.6984 | 5.2761 | 6.9175 | 5.4494 | 7.1427 | 5.6308 | 7.1427 | 5.8184 | 7.6170 |
| 1.0000 | 4.8322 | 6.3655 | 4.9878 | 6.5721 | 5.1497 | 6.7858 | 5.3182 | 7.0063 | 5.4938 | 7.0063 | 5.6749 | 7.4684 |

– molar fraction of *N,N*-dimethyloformamide; The uncertainty of the mole fraction *x*W is equal ±5·10−5.

**Table S9.** Isobaric (*Cp*,m) and isochoric (*CV*,m) molar heat capacity of (DMF + BuOH) mixtures at different temperature at pressure *p* = 0.1002 ± 0.005 MPa.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (J·mol−1·K−1) | | | | | | | | | | | |
|  | 293.15 K | | 298.15 K | | 303.15 K | | 308.15 K | | 313.15 K | | 318.15 K | |
|  | *Cp*,m | *CV*,m | *Cp*,m | *CV*,m | *Cp*,m | *CV*,m | *Cp*,m | *CV*,m | *Cp*,m | *CV*,m | *Cp*,m | *CV*,m |
| 0.0000 | 176.27 | 150.61 | 179.30 | 153.17 | 182.68 | 156.11 | 186.32 | 159.31 | 190.08 | 162.66 | 193.88 | 166.06 |
| 0.0500 | 174.70 | 148.24 | 177.50 | 150.62 | 180.64 | 153.33 | 183.96 | 156.26 | 187.42 | 159.35 | 190.85 | 162.41 |
| 0.1000 | 173.06 | 145.87 | 175.63 | 148.04 | 178.59 | 150.62 | 181.66 | 153.32 | 184.85 | 156.16 | 188.01 | 158.99 |
| 0.1500 | 171.50 | 143.53 | 173.94 | 145.62 | 176.65 | 148.00 | 179.40 | 150.44 | 182.23 | 152.98 | 185.16 | 155.63 |
| 0.1999 | 169.93 | 141.40 | 172.19 | 143.31 | 174.68 | 145.46 | 177.20 | 147.67 | 179.84 | 150.02 | 182.56 | 152.46 |
| 0.2499 | 168.35 | 139.27 | 170.45 | 141.03 | 172.68 | 142.94 | 175.05 | 145.01 | 177.52 | 147.19 | 179.98 | 149.39 |
| 0.3000 | 166.82 | 137.20 | 168.77 | 138.82 | 170.84 | 140.59 | 173.02 | 142.48 | 175.25 | 144.45 | 177.53 | 146.49 |
| 0.3499 | 165.28 | 135.19 | 167.09 | 136.67 | 168.99 | 138.27 | 171.01 | 140.00 | 173.08 | 141.81 | 175.15 | 143.63 |
| 0.4000 | 163.79 | 133.16 | 165.42 | 134.48 | 167.18 | 135.96 | 169.05 | 137.57 | 170.87 | 139.14 | 172.84 | 140.89 |
| 0.4500 | 162.31 | 131.19 | 163.79 | 132.38 | 165.40 | 133.70 | 167.08 | 135.12 | 168.79 | 136.61 | 170.63 | 138.23 |
| 0.5000 | 160.83 | 129.24 | 162.19 | 130.31 | 163.69 | 131.54 | 165.21 | 132.82 | 166.83 | 134.21 | 168.51 | 135.68 |
| 0.5500 | 159.44 | 127.41 | 160.67 | 128.36 | 162.06 | 129.49 | 163.45 | 130.64 | 164.95 | 131.92 | 166.50 | 133.26 |
| 0.6000 | 158.04 | 125.51 | 159.20 | 126.40 | 160.48 | 127.45 | 161.76 | 128.52 | 163.15 | 129.70 | 164.49 | 130.87 |
| 0.6500 | 156.65 | 123.68 | 157.73 | 124.50 | 158.89 | 125.43 | 160.07 | 126.39 | 161.34 | 127.47 | 162.70 | 128.65 |
| 0.7001 | 155.35 | 121.85 | 156.40 | 122.69 | 157.45 | 123.56 | 158.54 | 124.48 | 159.66 | 125.46 | 160.86 | 126.53 |
| 0.7500 | 154.05 | 120.15 | 154.99 | 120.89 | 155.95 | 121.67 | 156.95 | 122.51 | 158.10 | 123.52 | 159.05 | 124.36 |
| 0.8000 | 152.85 | 118.51 | 153.72 | 119.20 | 154.56 | 119.89 | 155.47 | 120.66 | 156.53 | 121.59 | 157.51 | 122.47 |
| 0.8500 | 151.61 | 116.90 | 152.42 | 117.53 | 153.16 | 118.11 | 154.02 | 118.84 | 154.95 | 119.65 | 155.82 | 120.42 |
| 0.8999 | 150.49 | 115.41 | 151.22 | 115.95 | 151.94 | 116.53 | 152.71 | 117.16 | 153.51 | 117.85 | 154.36 | 118.61 |
| 0.9500 | 149.42 | 114.02 | 150.05 | 114.46 | 150.66 | 114.91 | 151.39 | 115.50 | 152.16 | 116.16 | 152.91 | 116.81 |
| 1.0000 | 148.33 | 112.60 | 148.94 | 113.04 | 149.55 | 113.49 | 150.20 | 114.01 | 150.90 | 114.60 | 151.56 | 115.16 |

– molar fraction of *N,N*-dimethyloformamide; The uncertainty of the mole fraction *x*W is equal ±5·10−5.