Table S1. Density, ρ, and excess molar volume, *V*E, for the binary mixtures aromatic compound (1) + ionic liquid (2) at *T* = 283.15 K and atmospheric pressure.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *x*1 | *ρ*/(g·cm-3) | *V*E/(cm3·mol-1) | *x*1 | *ρ*/(g·cm-3) | *V*E/(cm3·mol-1) | *x*1 | *ρ*/(g·cm-3) | *V*E/(cm3·mol-1) |
| benzene (1) + [EMim][NTf2] (2) | | | toluene (1) + [EMim][NTf2] (2) | | | ethylbenzene (1) + [EMim][NTf2] (2) | | |
| 0.0000 | 1.53404 | 0.000 | 0.0000 | 1.53404 | 0.000 | 0.0000 | 1.53404 | 0.000 |
| 0.0450 | 1.52446 | -0.115 | 0.0470 | 1.52180 | -0.143 | 0.0548 | 1.51699 | -0.098 |
| 0.0962 | 1.51291 | -0.261 | 0.0991 | 1.50750 | -0.317 | 0.1041 | 1.50106 | -0.237 |
| 0.1942 | 1.48782 | -0.468 | 0.1988 | 1.47719 | -0.640 | 0.1985 | 1.46668 | -0.307 |
| 0.3038 | 1.45676 | -0.965 | 0.2953 | 1.44383 | -0.980 | 0.2934 | 1.42850 | -0.448 |
| 0.4104 | 1.41928 | -1.290 | 0.3983 | 1.40257 | -1.338 | 0.3956 | 1.38237 | -0.664 |
| 0.5024 | 1.38091 | -1.622 | 0.5018 | 1.35302 | -1.598 | 0.4594 | 1.34964 | -0.721 |
| 0.6084 | 1.32501 | -1.795 | 0.5968 | 1.29806 | -1.709 | 0.4817 | 1.33781 | -0.785 |
| 0.6993 | 1.26265 | -1.655 | 0.6192 | 1.28343 | -1.700 | 1.0000 | 0.87567 | 0.000 |
| 0.7329 | 1.23591 | -1.596 | 0.6326 | 1.27452 | -1.714 |  |  |  |
| 1.0000 | 0.88958 | 0.000 | 1.0000 | 0.87610 | 0.000 |  |  |  |
| *o*-xylene (1) + [EMim][NTf2] (2) | | | *m*-xylene (1) + [EMim][NTf2] (2) | | | *p*-xylene (1) + [EMim][NTf2] (2) | | |
| 0.0000 | 1.53404 | 0.000 | 0.0000 | 1.53404 | 0.000 | 0.0000 | 1.53404 | 0.000 |
| 0.0520 | 1.51874 | -0.146 | 0.0473 | 1.51963 | -0.147 | 0.0469 | 1.51985 | -0.179 |
| 0.1008 | 1.50376 | -0.313 | 0.0479 | 1.51962 | -0.173 | 0.0987 | 1.50328 | -0.376 |
| 0.1995 | 1.47064 | -0.643 | 0.1005 | 1.50259 | -0.325 | 0.1974 | 1.46896 | -0.762 |
| 0.3002 | 1.43205 | -0.916 | 0.1992 | 1.46794 | -0.631 | 0.2929 | 1.43117 | -1.065 |
| 0.3978 | 1.38912 | -1.128 | 0.3004 | 1.42791 | -0.946 | 0.4203 | 1.37274 | -1.429 |
| 0.4530 | 1.36239 | -1.270 | 0.3968 | 1.38475 | -1.259 | 0.4663 | 1.34924 | -1.590 |
| 0.5062 | 1.33370 | -1.294 | 0.4200 | 1.37322 | -1.293 | 1.0000 | 0.86960 | 0.000 |
| 0.5055 | 1.33427 | -1.317 | 0.4620 | 1.35175 | -1.408 |  |  |  |
| 0.5929 | 1.28306 | -1.500 | 1.0000 | 0.87269 | 0.000 |  |  |  |
| 1.0000 | 0.88810 | 0.000 |  |  |  |  |  |  |
| benzene (1) + [HMim][NTf2] (2) | | | toluene (1) + [HMim][NTf2] (2) | | | ethylbenzene (1) + [HMim][NTf2] (2) | | |
| 0.0000 | 1.38592 | 0.000 | 0.0000 | 1.38592 | 0.000 | 0.0000 | 1.38592 | 0.000 |
| 0.0442 | 1.38003 | -0.063 | 0.0492 | 1.37808 | -0.136 | 0.0514 | 1.37594 | -0.046 |
| 0.1025 | 1.37199 | -0.222 | 0.1025 | 1.36922 | -0.349 | 0.1003 | 1.36625 | -0.185 |
| 0.1963 | 1.35759 | -0.526 | 0.2018 | 1.35095 | -0.791 | 0.2108 | 1.34090 | -0.309 |
| 0.2990 | 1.33839 | -0.765 | 0.3065 | 1.32721 | -1.051 | 0.3061 | 1.31618 | -0.552 |
| 0.3675 | 1.32336 | -0.923 | 0.4026 | 1.30075 | -1.194 | 0.4271 | 1.27775 | -0.635 |
| 0.3905 | 1.31803 | -1.010 | 0.4983 | 1.26942 | -1.373 | 0.5009 | 1.25019 | -0.696 |
| 0.3989 | 1.31590 | -1.021 | 0.7015 | 1.17461 | -1.411 | 0.6594 | 1.17579 | -0.755 |
| 0.5962 | 1.25356 | -1.435 | 0.8110 | 1.09590 | -0.956 | 0.6754 | 1.16676 | -0.750 |
| 0.6486 | 1.23046 | -1.441 | 1.0000 | 0.87610 | 0.000 | 1.0000 | 0.87567 | 0.000 |
| 0.7520 | 1.17191 | -1.291 |  |  |  |  |  |  |
| 0.7536 | 1.17070 | -1.266 |  |  |  |  |  |  |
| 0.8265 | 1.11662 | -1.249 |  |  |  |  |  |  |
| 0.8367 | 1.10817 | -1.277 |  |  |  |  |  |  |
| 0.8706 | 1.07468 | -1.066 |  |  |  |  |  |  |
| 1.0000 | 0.88958 | 0.000 |  |  |  |  |  |  |
| *o*-xylene (1) + [HMim][NTf2] (2) | | | *m*-xylene (1) + [HMim][NTf2] (2) | | | *p*-xylene (1) + [HMim][NTf2] (2) | | |
| 0.0000 | 1.38592 | 0.000 | 0.0000 | 1.38592 | 0.000 | 0.0000 | 1.38592 | 0.000 |
| 0.0532 | 1.37662 | -0.192 | 0.0548 | 1.37585 | -0.202 | 0.0523 | 1.37616 | -0.178 |
| 0.1029 | 1.36758 | -0.428 | 0.1031 | 1.36615 | -0.341 | 0.1037 | 1.36570 | -0.312 |
| 0.2170 | 1.34285 | -0.675 | 0.1997 | 1.34472 | -0.612 | 0.2121 | 1.34151 | -0.689 |
| 0.2990 | 1.32262 | -0.913 | 0.4011 | 1.28855 | -1.136 | 0.3063 | 1.31741 | -1.062 |
| 0.3413 | 1.31088 | -0.985 | 0.3078 | 1.31639 | -0.814 | 0.4102 | 1.28534 | -1.299 |
| 0.4030 | 1.29218 | -1.079 | 0.5083 | 1.24939 | -1.293 | 0.6086 | 1.20353 | -1.466 |
| 0.6583 | 1.18705 | -1.333 | 0.6095 | 1.20433 | -1.405 | 0.6619 | 1.17568 | -1.516 |
| 0.7506 | 1.13229 | -1.317 | 0.7329 | 1.13264 | -1.175 | 0.7020 | 1.15198 | -1.472 |
| 1.0000 | 0.88810 | 0.000 | 1.0000 | 0.87269 | 0.000 | 1.0000 | 0.86960 | 0.000 |
| benzene (1) + [EMpy][NTf2] (2) | | | toluene (1) + [EMpy][NTf2] (2) | | | ethylbenzene (1) + [EMpy][NTf2] (2) | | |
| 0.0000 | 1.50310 | 0.000 | 0.0000 | 1.50310 | 0.000 | 0.0000 | 1.50310 | 0.000 |
| 0.0451 | 1.49440 | -0.115 | 0.0484 | 1.49212 | -0.226 | 0.0490 | 1.48935 | -0.095 |
| 0.0992 | 1.48335 | -0.277 | 0.1002 | 1.47954 | -0.464 | 0.1028 | 1.47359 | -0.250 |
| 0.2018 | 1.45976 | -0.579 | 0.2005 | 1.45203 | -0.834 | 0.1955 | 1.44378 | -0.477 |
| 0.2845 | 1.43814 | -0.877 | 0.2952 | 1.42235 | -1.213 | 0.2985 | 1.40600 | -0.681 |
| 0.3887 | 1.40591 | -1.222 | 0.4093 | 1.37980 | -1.585 | 0.4474 | 1.34081 | -0.915 |
| 0.4980 | 1.36446 | -1.568 | 0.4915 | 1.34421 | -1.915 | 0.5350 | 1.29511 | -1.021 |
| 0.5447 | 1.34348 | -1.682 | 0.5929 | 1.29006 | -2.015 | 0.5737 | 1.27277 | -1.048 |
| 0.6413 | 1.29185 | -1.835 | 0.6565 | 1.25054 | -2.102 | 1.0000 | 0.87567 | 0.000 |
| 0.7394 | 1.22442 | -1.882 | 0.6882 | 1.22836 | -2.086 |  |  |  |
| 0.7983 | 1.17352 | -1.794 | 0.7161 | 1.20757 | -2.076 |  |  |  |
| 1.0000 | 0.88958 | 0.000 | 1.0000 | 0.87610 | 0.000 |  |  |  |
| *o*-xylene (1) + [EMpy][NTf2] (2) | | | *m*-xylene (1) + [EMpy][NTf2] (2) | | | *p*-xylene (1) + [EMpy][NTf2] (2) | | |
| 0.0000 | 1.50310 | 0.000 | 0.0000 | 1.50310 | 0.000 | 0.0000 | 1.50310 | 0.000 |
| 0.0510 | 1.48997 | -0.225 | 0.0511 | 1.48908 | -0.183 | 0.0509 | 1.48939 | -0.246 |
| 0.1001 | 1.47637 | -0.406 | 0.0972 | 1.47612 | -0.417 | 0.1039 | 1.47387 | -0.443 |
| 0.1983 | 1.44667 | -0.785 | 0.2000 | 1.44399 | -0.862 | 0.2028 | 1.44355 | -1.041 |
| 0.2975 | 1.41246 | -1.139 | 0.3014 | 1.40821 | -1.343 | 0.3013 | 1.40802 | -1.439 |
| 0.4008 | 1.37083 | -1.400 | 0.4038 | 1.36504 | -1.579 | 0.4029 | 1.36617 | -1.857 |
| 0.5039 | 1.32274 | -1.686 | 0.4441 | 1.34673 | -1.742 | 0.5037 | 1.31623 | -2.010 |
| 0.5660 | 1.28958 | -1.830 | 0.4999 | 1.31990 | -2.023 | 0.5268 | 1.30373 | -2.047 |
| 0.6025 | 1.26838 | -1.907 | 0.5239 | 1.30739 | -2.113 | 0.5675 | 1.28049 | -2.103 |
| 1.0000 | 0.88810 | 0.000 | 0.5446 | 1.29544 | -2.079 | 1.0000 | 0.86960 | 0.000 |
|  |  |  | 0.5784 | 1.27673 | -2.258 |  |  |  |
|  |  |  | 1.0000 | 0.87269 | 0.000 |  |  |  |
| benzene (1) + [PMpy][NTf2] (2) | | | toluene (1) + [PMpy][NTf2] (2) | | | ethylbenzene (1) + [PMpy][NTf2] (2) | | |
| 0.0000 | 1.46172 | 0.000 | 0.0000 | 1.46172 | 0.000 | 0.0000 | 1.46172 | 0.000 |
| 0.0521 | 1.45291 | -0.137 | 0.1000 | 1.44029 | -0.305 | 0.1059 | 1.43395 | -0.066 |
| 0.0999 | 1.44417 | -0.253 | 0.1979 | 1.41697 | -0.728 | 0.2001 | 1.40727 | -0.350 |
| 0.1999 | 1.42414 | -0.575 | 0.2996 | 1.38884 | -1.165 | 0.4064 | 1.33395 | -0.736 |
| 0.2994 | 1.40071 | -0.900 | 0.4084 | 1.35229 | -1.488 | 0.5734 | 1.25448 | -0.916 |
| 0.3991 | 1.37246 | -1.196 | 0.5118 | 1.31048 | -1.796 | 0.5917 | 1.24470 | -0.988 |
| 0.5139 | 1.33260 | -1.587 | 0.6041 | 1.26452 | -1.931 | 0.6056 | 1.23672 | -0.995 |
| 0.6107 | 1.28873 | -1.722 | 0.6579 | 1.23342 | -2.009 | 0.6379 | 1.21755 | -1.029 |
| 0.7003 | 1.23685 | -1.746 | 0.6846 | 1.21616 | -1.994 | 1.0000 | 0.87567 | 0.000 |
| 0.7273 | 1.21830 | -1.713 | 0.7178 | 1.19305 | -1.956 |  |  |  |
| 0.7395 | 1.20914 | -1.665 | 0.7293 | 1.18408 | -1.874 |  |  |  |
| 0.7492 | 1.20240 | -1.704 | 1.0000 | 0.87610 | 0.000 |  |  |  |
| 0.7847 | 1.17305 | -1.561 |  |  |  |  |  |  |
| 0.7959 | 1.16308 | -1.503 |  |  |  |  |  |  |
| 1.0000 | 0.88958 | 0.000 |  |  |  |  |  |  |
| *o*-xylene (1) + [PMpy][NTf2] (2) | | | *m*-xylene (1) + [PMpy][NTf2] (2) | | | *p*-xylene (1) + [PMpy][NTf2] (2) | | |
| 0.0000 | 1.46172 | 0.000 | 0.0000 | 1.46172 | 0.000 | 0.0000 | 1.46172 | 0.000 |
| 0.0479 | 1.45035 | -0.097 | 0.0566 | 1.44828 | -0.246 | 0.0540 | 1.44872 | -0.218 |
| 0.1039 | 1.43593 | -0.154 | 0.1016 | 1.43677 | -0.409 | 0.1063 | 1.43573 | -0.508 |
| 0.2077 | 1.40710 | -0.396 | 0.1978 | 1.41008 | -0.804 | 0.2048 | 1.40810 | -0.938 |
| 0.3042 | 1.37672 | -0.671 | 0.3051 | 1.37591 | -1.230 | 0.3125 | 1.37328 | -1.382 |
| 0.4059 | 1.34173 | -1.271 | 0.4105 | 1.33593 | -1.506 | 0.4148 | 1.33419 | -1.702 |
| 0.4992 | 1.30302 | -1.625 | 0.5066 | 1.29316 | -1.722 | 0.5037 | 1.29439 | -1.909 |
| 0.5880 | 1.25848 | -1.737 | 0.6135 | 1.23590 | -1.821 | 0.6094 | 1.23793 | -2.018 |
| 0.6238 | 1.23800 | -1.709 | 0.6313 | 1.22472 | -1.753 | 0.6229 | 1.22983 | -2.021 |
| 0.6490 | 1.22251 | -1.654 | 1.0000 | 0.87269 | 0.000 | 0.6269 | 1.22765 | -2.062 |
| 1.0000 | 0.88810 | 0.000 |  |  |  | 0.6379 | 1.22093 | -2.067 |
|  |  |  |  |  |  | 1.0000 | 0.86960 | 0.000 |
| benzene (1) + [EMpy][ESO4] (2) | | | toluene (1) + [EMpy][ESO4] (2) | | | ethylbenzene (1) + [EMpy][ESO4]v(2) | | |
| 0.0000 | 1.23073 | 0.000 | 0.0000 | 1.23073 | 0.000 | 0.0000 | 1.23073 | 0.000 |
| 0.0483 | 1.22428 | -0.151 | 0.0517 | 1.22255 | -0.267 | 0.0532 | 1.21997 | -0.142 |
| 0.1029 | 1.21714 | -0.417 | 0.1036 | 1.21471 | -0.661 | 0.1241 | 1.20482 | -0.324 |
| 0.1981 | 1.20338 | -0.875 | 0.2023 | 1.19528 | -0.928 | 0.1460 | 1.19979 | -0.355 |
| 0.3038 | 1.18439 | -1.166 | 0.2751 | 1.18033 | -1.237 | 0.1639 | 1.19637 | -0.499 |
| 0.4028 | 1.16392 | -1.449 | 0.3222 | 1.17041 | -1.503 | 0.1732 | 1.19488 | -0.625 |
| 0.4979 | 1.14045 | -1.630 | 0.3501 | 1.16388 | -1.602 | 0.1875 | 1.19090 | -0.558 |
| 0.6009 | 1.11137 | -1.918 | 0.3661 | 1.16027 | -1.695 | 0.1934 | 1.19035 | -0.702 |
| 1.0000 | 0.88958 | 0.000 | 1.0000 | 0.87610 | 0.000 | 1.0000 | 0.87567 | 0.000 |
| *o*-xylene (1) + [EMpy][ESO4] (2) | | | *m*-xylene (1) + [EMpy][ESO4] (2) | | | *p*-xylene (1) + [EMpy][ESO4] (2) | | |
| 0.0000 | 1.23073 | 0.000 | 0.0000 | 1.23073 | 0.000 | 0.0000 | 1.23073 | 0.000 |
| 0.0495 | 1.22207 | -0.264 | 0.0505 | 1.22085 | -0.208 | 0.0494 | 1.22142 | -0.282 |
| 0.1048 | 1.21240 | -0.632 | 0.1027 | 1.21024 | -0.429 | 0.1138 | 1.20821 | -0.573 |
| 0.1561 | 1.20171 | -0.774 | 0.1213 | 1.20653 | -0.541 | 0.1206 | 1.20734 | -0.696 |
| 0.2007 | 1.19244 | -0.964 | 0.1433 | 1.20221 | -0.693 | 0.1401 | 1.20284 | -0.731 |
| 0.2320 | 1.18690 | -1.283 | 0.1631 | 1.19782 | -0.764 | 0.1696 | 1.19658 | -0.896 |
| 0.2524 | 1.18239 | -1.366 | 0.1813 | 1.19400 | -0.875 | 0.1870 | 1.19257 | -0.954 |
| 0.2554 | 1.18201 | -1.424 | 0.2016 | 1.19138 | -1.262 | 0.1972 | 1.19040 | -1.024 |
| 1.0000 | 0.88810 | 0.000 | 0.1962 | 1.19264 | -1.245 | 1.0000 | 0.86960 | 0.000 |
|  |  |  | 1.0000 | 0.87269 | 0.000 |  |  |  |
| benzene (1) + [HMim][dca] (2) | | | toluene (1) + [HMim][dca] (2) | | | ethylbenzene (1) + [HMim][dca] (2) | | |
| 0.0000 | 1.03430 | 0.000 | 0.0000 | 1.03430 | 0.000 | 0.0000 | 1.03430 | 0.000 |
| 0.0501 | 1.03223 | -0.179 | 0.0494 | 1.03168 | -0.239 | 0.0555 | 1.03045 | -0.216 |
| 0.1058 | 1.02978 | -0.379 | 0.1031 | 1.02859 | -0.483 | 0.1101 | 1.02683 | -0.505 |
| 0.2040 | 1.02489 | -0.717 | 0.2071 | 1.02196 | -0.950 | 0.2088 | 1.02104 | -1.285 |
| 0.2980 | 1.01963 | -1.060 | 0.3060 | 1.01463 | -1.360 | 0.3135 | 1.01202 | -1.711 |
| 0.3969 | 1.01285 | -1.360 | 0.4079 | 1.00576 | -1.740 | 0.4082 | 1.00180 | -1.900 |
| 0.4343 | 1.01020 | -1.508 | 0.5128 | 0.99442 | -2.010 | 0.4247 | 1.00006 | -1.961 |
| 0.5115 | 1.00333 | -1.691 | 0.6058 | 0.98237 | -2.192 | 0.4470 | 0.99753 | -2.024 |
| 0.5999 | 0.99403 | -1.879 | 0.6269 | 0.97919 | -2.204 | 1.0000 | 0.87567 | 0.000 |
| 0.7034 | 0.97989 | -1.978 | 0.6330 | 0.97802 | -2.173 |  |  |  |
| 0.7264 | 0.97578 | -1.934 | 0.6491 | 0.97552 | -2.188 |  |  |  |
| 0.7449 | 0.97255 | -1.926 | 1.0000 | 0.87610 | 0.000 |  |  |  |
| 0.7698 | 0.96758 | -1.868 |  |  |  |  |  |  |
| 1.0000 | 0.88958 | 0.000 |  |  |  |  |  |  |
| *o*-xylene (1) + [HMim][dca] (2) | | | *m*-xylene (1) + [HMim][dca] (2) | | | *p*-xylene (1) + [HMim][dca] (2) | | |
| 0.0000 | 1.03430 | 0.000 | 0.0000 | 1.03430 | 0.000 | 0.0000 | 1.03430 | 0.000 |
| 0.1070 | 1.03208 | -1.351 | 0.1037 | 1.03138 | -1.369 | 0.1027 | 1.03064 | -1.240 |
| 0.2034 | 1.02542 | -1.700 | 0.2099 | 1.02293 | -1.769 | 0.2062 | 1.02326 | -1.848 |
| 0.2738 | 1.01988 | -1.912 | 0.3080 | 1.01375 | -2.051 | 0.3052 | 1.01406 | -2.180 |
| 0.3059 | 1.01722 | -2.013 | 0.4055 | 1.00366 | -2.344 | 0.4043 | 1.00287 | -2.349 |
| 0.4084 | 1.00764 | -2.259 | 0.4931 | 0.99304 | -2.518 | 0.4431 | 0.99853 | -2.484 |
| 0.4651 | 1.00179 | -2.395 | 0.4862 | 0.99426 | -2.563 | 0.4665 | 0.99536 | -2.488 |
| 0.5318 | 0.99401 | -2.492 | 0.5004 | 0.99241 | -2.586 | 0.4836 | 0.99272 | -2.445 |
| 1.0000 | 0.88810 | 0.000 | 1.0000 | 0.87269 | 0.000 | 1.0000 | 0.86960 | 0.000 |

*\** Standard uncertainty: *x* is ±0.0001, *ρ* is±0.00003 g·cm-3 and *V*E is ±0.007 cm3·mol-1.