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# Effect of Temperature on Thermodynamic Properties of Protic Ionic Liquids: 2-Hydroxy Ethylammonium Lactate (2-HEAL) + Short Hydroxylic Solvent

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*Supplementary Table 1. Densities (ρ), ultrasonic velocities (u), isentropic compressibilities ($\kappa_S$), excess molar volume ($V^E$) and change of isentropic compressibility ($\delta\kappa_S$) for 2-hydroxy ethylammonium lactate (2-HEAL) and its solutions with short hydroxylic solvents, (a) water, (b) methanol and (c) ethanol at the range of temperatures 288.15 – 323.15 K.*

**Water (1) + 2-HEAL (2)**

| $x_2$ | ρ ($gcm^{-3}$) | u ($ms^{-1}$) | $\kappa_S$ ($TPa^{-1}$) | $V^E$ ($cm^3mol^{-1}$) | $\delta\kappa_S$ ($TPa^{-1}$) | $x_2$ | ρ ($gcm^{-3}$) | u ($ms^{-1}$) | $\kappa_S$ ($TPa^{-1}$) | $V^E$ ($cm^3mol^{-1}$) | $\delta\kappa_S$ ($TPa^{-1}$) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **T = 323.15 K** | | | | | | **T = 320.65 K** | | | | | |
| 0.9912 | 1.0032 | 1575.13 | 401.768 | -0.0700 | -22.3334 | 0.9912 | 1.0044 | 1573.12 | 402.3221 | -0.0708 | -22.684 |
| 0.9865 | 1.0101 | 1590.11 | 391.5524 | -0.0931 | -31.7915 | 0.9865 | 1.0113 | 1588.46 | 391.9046 | -0.0938 | -32.3262 |
| 0.9707 | 1.0316 | 1636.12 | 362.1249 | -0.1885 | -58.5826 | 0.9707 | 1.0328 | 1635.62 | 361.9113 | -0.1895 | -59.6191 |
| 0.9490 | 1.0555 | 1686.11 | 333.2625 | -0.3001 | -83.8472 | 0.9490 | 1.0568 | 1686.95 | 332.518 | -0.3017 | -85.3624 |
| 0.9293 | 1.0725 | 1719.94 | 315.1985 | -0.3795 | -98.6268 | 0.9293 | 1.0739 | 1721.72 | 314.1429 | -0.3821 | -100.405 |
| 0.9027 | 1.0907 | 1753.19 | 298.2968 | -0.4624 | -111.1050 | 0.9027 | 1.0921 | 1755.96 | 296.9671 | -0.4656 | -113.066 |
| 0.6892 | 1.1532 | 1821.49 | 261.3593 | -0.6646 | -112.5110 | 0.6892 | 1.1548 | 1826.74 | 259.5104 | -0.6700 | -114.389 |
| 0.5253 | 1.1699 | 1819.45 | 258.2044 | -0.643 | -88.3948 | 0.5253 | 1.1715 | 1824.84 | 256.3351 | -0.6500 | -89.8091 |
| 0.3197 | 1.1786 | 1812.71 | 258.2189 | -0.3743 | -54.1844 | 0.3197 | 1.1801 | 1818.33 | 256.2903 | -0.3793 | -55.0465 |
| **T = 318.15 K** | | | | | | **T = 315.65 K** | | | | | |
| 0.9912 | 1.0055 | 1570.74 | 403.0968 | -0.0712 | -23.0723 | 0.9912 | 1.0066 | 1568.04 | 404.0522 | -0.0715 | -23.5573 |
| 0.9865 | 1.0124 | 1586.46 | 392.4509 | -0.0945 | -32.9163 | 0.9865 | 1.0135 | 1584.12 | 393.1801 | -0.0951 | -33.5992 |
| 0.9707 | 1.0340 | 1634.82 | 361.8417 | -0.1908 | -60.7870 | 0.9707 | 1.0352 | 1633.75 | 361.8993 | -0.1920 | -62.0944 |
| 0.9490 | 1.0581 | 1687.55 | 331.8702 | -0.3042 | -87.0398 | 0.9490 | 1.0594 | 1687.93 | 331.3231 | -0.306 | -88.8830 |
| 0.9293 | 1.0752 | 1723.32 | 313.1633 | -0.3852 | -102.3370 | 0.9293 | 1.0766 | 1724.73 | 312.2623 | -0.3878 | -104.474 |
| 0.9027 | 1.0935 | 1758.58 | 295.6984 | -0.4695 | -115.2150 | 0.9027 | 1.0949 | 1761.09 | 294.4791 | -0.4728 | -117.561 |
| 0.6892 | 1.1563 | 1831.94 | 257.6934 | -0.6766 | -116.4020 | 0.6892 | 1.1579 | 1837.17 | 255.8875 | -0.6811 | -118.612 |
| 0.5253 | 1.1730 | 1830.36 | 254.4547 | -0.6567 | -91.3653 | 0.5253 | 1.1746 | 1835.91 | 252.5848 | -0.6606 | -93.0718 |
| 0.3197 | 1.1816 | 1824.00 | 254.3696 | -0.3852 | -55.9941 | 0.3197 | 1.1832 | 1829.7 | 252.4624 | -0.3861 | -57.0352 |
| **T = 313.15 K** | | | | | | **T = 310.65 K** | | | | | |
| 0.9912 | 1.0076 | 1564.97 | 405.2203 | -0.0721 | -24.0879 | 0.9912 | 310.65 | 1.0086 | 1561.55 | 406.5977 | -0.0723 |
| 0.9865 | 1.0146 | 1581.48 | 394.0817 | -0.0958 | -34.4102 | 0.9865 | 310.65 | 1.0156 | 1578.49 | 395.1749 | -0.0964 |
| 0.9707 | 1.0364 | 1632.39 | 362.1003 | -0.1934 | -63.5489 | 0.9707 | 310.65 | 1.0375 | 1630.76 | 362.4364 | -0.1946 |
| 0.9490 | 1.0606 | 1688.08 | 330.8738 | -0.3083 | -90.8736 | 0.9490 | 310.65 | 1.0618 | 1688.01 | 330.521 | -0.3105 |
| 0.9293 | 1.0779 | 1725.97 | 311.4319 | -0.3907 | -106.782 | 0.9293 | 310.65 | 1.0792 | 1727.02 | 310.6815 | -0.3936 |
| 0.9027 | 1.0963 | 1763.41 | 293.3324 | -0.4764 | -120.095 | 0.9027 | 310.65 | 1.0977 | 1765.6 | 292.2400 | -0.4803 |
| 0.6892 | 1.1594 | 1842.32 | 254.1209 | -0.6854 | -120.956 | 0.6892 | 310.65 | 1.1609 | 1847.46 | 252.3757 | -0.6902 |
| 0.5253 | 1.1761 | 1841.46 | 250.7380 | -0.6624 | -94.8857 | 0.5253 | 310.65 | 1.1777 | 1846.98 | 248.9176 | -0.6654 |
| 0.3197 | 1.1847 | 1835.39 | 250.5776 | -0.3852 | -58.1208 | 0.3197 | 310.65 | 1.1862 | 1841.12 | 248.7033 | -0.3851 |
| **T = 308.15 K** | | | | | | **T = 305.65 K** | | | | | |
| 0.9912 | 1.0096 | 1557.78 | 408.1837 | -0.0728 | -25.4216 | 0.9912 | 1.0105 | 1553.66 | 409.9818 | -0.0735 | -26.1991 |

*Corresponding Author

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.9865 | 1.0166 | 1575.16 | 396.465 | -0.0972 | -36.2567 | 0.9865 | 1.0175 | 1571.47 | 397.9611 | -0.0981 | -37.3029 |
| 0.9707 | 1.0386 | 1628.84 | 362.9136 | -0.1962 | -66.8413 | 0.9707 | 1.0396 | 1626.61 | 363.5418 | -0.1980 | -68.6807 |
| 0.9490 | 1.063 | 1687.71 | 330.2684 | -0.3131 | -95.3974 | 0.9490 | 1.0642 | 1687.17 | 330.1165 | -0.3161 | -97.9437 |
| 0.9293 | 1.0804 | 1727.88 | 310.0075 | -0.3971 | -111.947 | 0.9293 | 1.0817 | 1728.56 | 309.4057 | -0.4008 | -114.857 |
| 0.9027 | 1.099 | 1767.66 | 291.2011 | -0.4846 | -125.757 | 0.9027 | 1.1004 | 1769.58 | 290.2183 | -0.4891 | -128.930 |
| 0.6892 | 1.1625 | 1852.56 | 250.6578 | -0.6958 | -126.187 | 0.6892 | 1.1640 | 1857.67 | 248.9551 | -0.7016 | -129.073 |
| 0.5253 | 1.1792 | 1852.47 | 247.1234 | -0.669 | -98.9036 | 0.5253 | 1.1807 | 1858.00 | 245.3404 | -0.6720 | -101.117 |
| 0.3197 | 1.1877 | 1846.85 | 246.8524 | -0.3839 | -60.5296 | 0.3197 | 1.1892 | 1852.63 | 245.0071 | -0.3830 | -61.8621 |
| **T = 303.15 K** | | | | | | **T = 300.65 K** | | | | | |
| 0.9912 | 1.0113 | 1549.17 | 412.0111 | -0.0740 | -27.0247 | 0.9912 | 1.0121 | 1544.28 | 414.2927 | -0.0748 | -27.9395 |
| 0.9865 | 1.0184 | 1567.43 | 399.6617 | -0.0989 | -38.4583 | 0.9865 | 1.0193 | 1563.01 | 401.5901 | -0.1001 | -39.7251 |
| 0.9707 | 1.0406 | 1624.08 | 364.3214 | -0.1998 | -70.6756 | 0.9707 | 1.0416 | 1621.26 | 365.2494 | -0.202 | -72.8500 |
| 0.9490 | 1.0653 | 1686.40 | 330.0644 | -0.3192 | -100.654 | 0.9490 | 1.0664 | 1685.38 | 330.1232 | -0.3226 | -103.573 |
| 0.9293 | 1.0829 | 1729.05 | 308.8791 | -0.4049 | -117.949 | 0.9293 | 1.0841 | 1729.33 | 308.4373 | -0.4094 | -121.264 |
| 0.9027 | 1.1017 | 1771.35 | 289.2916 | -0.4942 | -132.294 | 0.9027 | 1.1030 | 1772.98 | 288.4222 | -0.4996 | -135.898 |
| 0.6892 | 1.1655 | 1862.72 | 247.2842 | -0.7081 | -132.129 | 0.6892 | 1.1670 | 1867.76 | 245.6332 | -0.7150 | -135.379 |
| 0.5253 | 1.1822 | 1863.54 | 243.5703 | -0.6763 | -103.465 | 0.5253 | 1.1837 | 1869.10 | 241.8165 | -0.6802 | -105.951 |
| 0.3197 | 1.1907 | 1858.46 | 243.1615 | -0.3853 | -63.2713 | 0.3197 | 1.1923 | 1864.37 | 241.3062 | -0.391 | -64.7775 |
| **T = 298.15 K** | | | | | | **T = 295.65 K** | | | | | |
| 0.9912 | 1.0129 | 1538.97 | 416.8395 | -0.0758 | -28.9281 | 0.9912 | 1.0136 | 1533.23 | 419.6722 | -0.0767 | -29.9519 |
| 0.9865 | 1.0201 | 1558.22 | 403.746 | -0.1012 | -41.0656 | 0.9865 | 1.0208 | 1553.03 | 406.1504 | -0.1024 | -42.4733 |
| 0.9707 | 1.0425 | 1618.11 | 366.3458 | -0.2043 | -75.1498 | 0.9707 | 1.0434 | 1614.62 | 367.6138 | -0.207 | -77.6176 |
| 0.9490 | 1.0675 | 1684.12 | 330.2829 | -0.3265 | -106.703 | 0.9490 | 1.0685 | 1682.6 | 330.5578 | -0.3304 | -110.019 |
| 0.9293 | 1.0853 | 1729.42 | 308.0727 | -0.4140 | -124.809 | 0.9293 | 1.0864 | 1729.31 | 307.7858 | -0.4192 | -128.566 |
| 0.9027 | 1.1043 | 1774.45 | 287.6107 | -0.5056 | -139.735 | 0.9027 | 1.1055 | 1775.78 | 286.8553 | -0.5118 | -143.800 |
| 0.6892 | 1.1685 | 1872.79 | 244.0019 | -0.7222 | -138.821 | 0.6892 | 1.1700 | 1877.79 | 242.3930 | -0.7300 | -142.453 |
| 0.5253 | 1.1852 | 1874.69 | 240.0723 | -0.6845 | -108.577 | 0.5253 | 1.1867 | 1880.32 | 238.3372 | -0.6888 | -111.340 |
| 0.3197 | 1.1938 | 1870.38 | 239.4446 | -0.3970 | -66.343 | 0.3197 | 1.1953 | 1876.53 | 237.5713 | -0.4019 | -67.9836 |
| **T = 293.15 K** | | | | | | **T = 290.65 K** | | | | | |
| 0.9912 | 1.0143 | 1527.06 | 422.7993 | -0.0776 | -31.056 | 0.9912 | 1.0149 | 1520.50 | 426.2032 | -0.0788 | -32.230 |
| 0.9865 | 1.0215 | 1547.44 | 408.8057 | -0.1039 | -43.9934 | 0.9865 | 1.0222 | 1541.44 | 411.7325 | -0.1056 | -45.6315 |
| 0.9707 | 1.0443 | 1610.8 | 369.0589 | -0.2098 | -80.2666 | 0.9707 | 1.0451 | 1606.65 | 370.6804 | -0.2130 | -83.0753 |
| 0.9490 | 1.0696 | 1680.83 | 330.9385 | -0.335 | -113.598 | 0.9490 | 1.0705 | 1678.79 | 331.4396 | -0.3399 | -117.354 |
| 0.9293 | 1.0876 | 1728.99 | 307.5798 | -0.425 | -132.597 | 0.9293 | 1.0887 | 1728.46 | 307.4575 | -0.4312 | -136.863 |
| 0.9027 | 1.1067 | 1776.94 | 286.1600 | -0.5188 | -148.117 | 0.9027 | 1.1080 | 1777.96 | 285.517 | -0.5263 | -152.737 |
| 0.6892 | 1.1715 | 1882.79 | 240.8006 | -0.7384 | -146.285 | 0.6892 | 1.1730 | 1887.75 | 239.2347 | -0.7469 | -150.312 |
| 0.5253 | 1.1882 | 1886.00 | 236.6087 | -0.6935 | -114.24 | 0.5253 | 1.1897 | 1891.69 | 234.887 | -0.7008 | -117.263 |
| 0.3197 | 1.1969 | 1882.83 | 235.6785 | -0.4085 | -69.7111 | 0.3197 | 1.1984 | 1889.31 | 233.7638 | -0.414 | -71.4786 |
| **T = 323.15 K** | | | | | | | | | | | |
| 0.9912 | 1.0154 | 1513.41 | 429.9771 | -0.0798 | -33.3946 | | | | | | |
| 0.9865 | 1.0228 | 1534.95 | 414.9820 | -0.1069 | -47.3055 | | | | | | |
| 0.9707 | 1.0459 | 1602.11 | 372.5133 | -0.2157 | -86.0561 | | | | | | |
| 0.9490 | 1.0715 | 1676.47 | 332.0629 | -0.3443 | -121.381 | | | | | | |
| 0.9293 | 1.0898 | 1727.71 | 307.4195 | -0.4366 | -141.391 | | | | | | |
| 0.9027 | 1.1092 | 1778.81 | 284.9356 | -0.5325 | -157.602 | | | | | | |
| 0.6892 | 1.1744 | 1892.72 | 237.6821 | -0.7503 | -154.512 | | | | | | |
| 0.5253 | 1.1913 | 1897.52 | 233.1421 | -0.7019 | -120.435 | | | | | | |
| 0.3197 | 1.200 | 1896.07 | 231.8040 | -0.4071 | -73.3091 | | | | | | |

## Methanol (1) + 2-HEAL (2)

| $x_2$ | $\rho$ ($gcm^{-3}$) | u ($ms^{-1}$) | $\kappa_S$ ($TPa^{-1}$) | $V^E$ ($cm^3mol^{-1}$) | $\delta\kappa_S$ ($TPa^{-1}$) | $x_2$ | $\rho$ ($gcm^{-3}$) | u ($ms^{-1}$) | $\kappa_S$ ($TPa^{-1}$) | $V^E$ ($cm^3mol^{-1}$) | $\delta\kappa_S$ ($TPa^{-1}$) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **T = 323.15 K** | | | | | | **T = 320.65 K** | | | | | |
| 0.8985 | 0.8906 | 1201.94 | 777.2601 | -1.124 | -380.305 | 0.8985 | 0.8935 | 1208.98 | 765.7065 | -1.1556 | -370.389 |
| 0.7972 | 0.9735 | 1337.19 | 574.4779 | -1.5981 | -481.774 | 0.7972 | 0.9756 | 1343.64 | 567.7859 | -1.5901 | -469.259 |
| 0.7069 | 1.0249 | 1431.89 | 475.8661 | -1.7178 | -490.093 | 0.7069 | 1.0268 | 1438.2 | 470.8461 | -1.6985 | -477.844 |
| 0.6083 | 1.0648 | 1518.98 | 407.0275 | -1.5545 | -460.362 | 0.6083 | 1.0666 | 1525.23 | 403.0362 | -1.5352 | -449.218 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.5180 | 1.0944 | 1581.07 | 365.5423 | -1.4346 | -411.581 | 0.5180 | 1.0961 | 1587.06 | 362.2288 | -1.4172 | -401.698 |
| 0.4275 | 1.1174 | 1637.53 | 333.7525 | -1.1998 | -352.883 | 0.4275 | 1.119 | 1643.39 | 330.8879 | -1.1857 | -344.492 |
| 0.3811 | 1.1275 | 1662.69 | 320.8281 | -1.064 | -319.416 | 0.3811 | 1.1291 | 1668.41 | 318.172 | -1.0516 | -311.827 |
| 0.2586 | 1.1515 | 1714.97 | 295.2776 | -0.8105 | -222.486 | 0.2586 | 1.153 | 1720.82 | 292.8741 | -0.8012 | -217.286 |
| 0.1469 | 1.1673 | 1758.03 | 277.1796 | -0.3709 | -128.897 | 0.1469 | 1.1689 | 1763.7 | 275.0374 | -0.3666 | -127.333 |
| 0.0675 | 1.1778 | 1784.83 | 266.5321 | -0.1371 | -60.1706 | 0.0675 | 1.1793 | 1790.53 | 264.4965 | -0.136 | -58.7527 |
| **T = 318.15 K** | | | | | | **T = 315.65 K** | | | | | |
| 0.8985 | 0.8958 | 1216.08 | 754.8485 | -1.1455 | -360.172 | 0.8985 | 0.898 | 1223.22 | 744.2426 | -1.136 | -350.411 |
| 0.7972 | 0.9776 | 1350.11 | 561.2008 | -1.5693 | -456.915 | 0.7972 | 0.9795 | 1356.64 | 554.6991 | -1.551 | -445.08 |
| 0.7069 | 1.0286 | 1444.55 | 465.8817 | -1.6737 | -465.788 | 0.7069 | 1.0305 | 1450.97 | 460.9212 | -1.6564 | -454.299 |
| 0.6083 | 1.0683 | 1531.39 | 399.1416 | -1.5132 | -438.182 | 0.6083 | 1.0701 | 1537.59 | 395.2817 | -1.4933 | -427.624 |
| 0.5180 | 1.0977 | 1593.09 | 358.9384 | -1.3973 | -391.969 | 0.5180 | 1.0994 | 1599.13 | 355.6844 | -1.3787 | -382.639 |
| 0.4275 | 1.1207 | 1649.25 | 328.0599 | -1.1692 | -336.271 | 0.4275 | 1.1223 | 1655.17 | 325.2414 | -1.1526 | -328.343 |
| 0.3811 | 1.1307 | 1674.18 | 315.5272 | -1.038 | -304.383 | 0.3811 | 1.1324 | 1680.02 | 312.8891 | -1.0228 | -297.257 |
| 0.2586 | 1.1546 | 1726.65 | 290.5041 | -0.7917 | -212.186 | 0.2586 | 1.1562 | 1732.57 | 288.1305 | -0.7796 | -207.289 |
| 0.1469 | 1.1704 | 1769.42 | 272.9072 | -0.3611 | -122.907 | 0.1469 | 1.1719 | 1775.2 | 270.7789 | -0.3524 | -120.036 |
| 0.0675 | 1.1808 | 1796.21 | 262.4924 | -0.1345 | -57.3398 | 0.0675 | 1.1823 | 1801.93 | 260.4999 | -0.1264 | -55.9675 |
| **T = 313.15 K** | | | | | | **T = 310.65 K** | | | | | |
| 0.8985 | 0.9001 | 1230.35 | 733.9172 | -1.1181 | -341.011 | 0.8985 | 0.9022 | 1237.49 | 723.776 | -1.1008 | -331.704 |
| 0.7972 | 0.9815 | 1363.2 | 548.293 | -1.527 | -433.807 | 0.7972 | 0.9834 | 1369.72 | 542.0362 | -1.502 | -422.592 |
| 0.7069 | 1.0324 | 1457.34 | 456.0863 | -1.632 | -443.224 | 0.7069 | 1.0342 | 1463.75 | 451.3005 | -1.608 | -432.278 |
| 0.6083 | 1.0718 | 1543.76 | 391.4881 | -1.4696 | -417.408 | 0.6083 | 1.0736 | 1549.91 | 387.7543 | -1.4471 | -407.357 |
| 0.5180 | 1.1011 | 1605.18 | 352.4665 | -1.3565 | -373.65 | 0.5180 | 1.1028 | 1611.2 | 349.3046 | -1.3349 | -364.77 |
| 0.4275 | 1.1239 | 1661.11 | 322.4483 | -1.1325 | -320.7 | 0.4275 | 1.1256 | 1667.07 | 319.6804 | -1.114 | -313.194 |
| 0.3811 | 1.134 | 1685.88 | 310.2711 | -1.0049 | -290.358 | 0.3811 | 1.1356 | 1691.7 | 307.7003 | -0.9878 | -283.534 |
| 0.2586 | 1.1577 | 1738.5 | 285.7851 | -0.7624 | -202.53 | 0.2586 | 1.1593 | 1744.47 | 283.4505 | -0.7478 | -197.865 |
| 0.1469 | 1.1734 | 1781.07 | 268.6486 | -0.3395 | -117.274 | 0.1469 | 1.1749 | 1786.96 | 266.5375 | -0.3275 | -114.543 |
| 0.0675 | 1.1838 | 1807.73 | 258.5052 | -0.1152 | -54.6427 | 0.0675 | 1.1853 | 1813.6 | 256.4965 | -0.1132 | -53.3412 |
| **T = 308.15 K** | | | | | | **T = 305.65 K** | | | | | |
| 0.8985 | 0.9043 | 1244.59 | 713.888 | -1.0841 | -322.719 | 0.8985 | 0.9064 | 1251.76 | 704.1059 | -1.0679 | -314.064 |
| 0.7972 | 0.9852 | 1376.22 | 535.9253 | -1.4753 | -411.703 | 0.7972 | 0.9864 | 1382.76 | 530.2381 | -1.4104 | -400.817 |
| 0.7069 | 1.036 | 1470.17 | 446.5774 | -1.5855 | -421.709 | 0.7069 | 1.0379 | 1476.61 | 441.91 | -1.5636 | -411.47 |
| 0.6083 | 1.0753 | 1556.03 | 384.0841 | -1.4259 | -397.583 | 0.6083 | 1.0771 | 1562.12 | 380.4795 | -1.4044 | -388.079 |
| 0.5180 | 1.1045 | 1617.22 | 346.1784 | -1.3151 | -356.171 | 0.5180 | 1.1062 | 1623.22 | 343.1052 | -1.2943 | -347.778 |
| 0.4275 | 1.1272 | 1673.00 | 316.9591 | -1.0955 | -305.88 | 0.4275 | 1.1288 | 1678.97 | 314.2547 | -1.0774 | -298.758 |
| 0.3811 | 1.1372 | 1697.63 | 305.1191 | -0.9715 | -276.955 | 0.3811 | 1.1388 | 1703.51 | 302.588 | -0.9548 | -270.515 |
| 0.2586 | 1.1609 | 1750.5 | 281.1251 | -0.733 | -193.35 | 0.2586 | 1.1624 | 1756.56 | 278.8189 | -0.7174 | -188.922 |
| 0.1469 | 1.1765 | 1792.86 | 264.4373 | -0.3197 | -111.902 | 0.1469 | 1.1781 | 1798.84 | 262.3297 | -0.315 | -109.335 |
| 0.0675 | 1.1869 | 1819.58 | 254.4784 | -0.1113 | -52.1077 | 0.0675 | 1.1884 | 1825.71 | 252.4406 | -0.1094 | -50.9083 |
| **T = 303.15 K** | | | | | | **T = 300.65 K** | | | | | |
| 0.8985 | 0.9085 | 1258.94 | 694.5037 | -1.0506 | -305.695 | 0.8985 | 0.9106 | 1266.14 | 685.0515 | -1.036 | -297.876 |
| 0.7972 | 0.9889 | 1389.3 | 523.8874 | -1.4266 | -390.94 | 0.7972 | 0.991 | 1395.85 | 517.9139 | -1.4136 | -381.383 |
| 0.7069 | 1.0397 | 1483.04 | 437.3194 | -1.5408 | -401.473 | 0.7069 | 1.0415 | 1489.49 | 432.7825 | -1.5198 | -391.97 |
| 0.6083 | 1.0788 | 1568.16 | 376.9453 | -1.383 | -378.773 | 0.6083 | 1.0805 | 1574.17 | 373.4667 | -1.3639 | -369.874 |
| 0.5180 | 1.1078 | 1629.21 | 340.0704 | -1.2744 | -339.567 | 0.5180 | 1.1095 | 1635.24 | 337.0558 | -1.2559 | -331.758 |
| 0.4275 | 1.1305 | 1684.95 | 311.5781 | -1.0597 | -291.843 | 0.4275 | 1.1321 | 1690.92 | 308.9391 | -1.0422 | -285.18 |
| 0.3811 | 1.1404 | 1709.38 | 300.0892 | -0.9384 | -264.226 | 0.3811 | 1.142 | 1715.25 | 297.6212 | -0.9223 | -258.184 |
| 0.2586 | 1.164 | 1762.64 | 276.5276 | -0.7043 | -184.615 | 0.2586 | 1.1656 | 1768.85 | 274.21 | -0.6963 | -180.497 |
| 0.1469 | 1.1796 | 1804.93 | 260.2135 | -0.311 | -106.813 | 0.1469 | 1.1812 | 1811.24 | 258.0601 | -0.3065 | -104.432 |
| 0.0675 | 1.19 | 1831.94 | 250.3999 | -0.1075 | -49.7505 | 0.0675 | 1.1915 | 1838.42 | 248.3165 | -0.1048 | -48.6306 |
| **T = 298.15 K** | | | | | | **T = 295.65 K** | | | | | |
| 0.8985 | 0.9127 | 1273.35 | 675.7719 | -1.0199 | -290.01 | 0.8985 | 0.9147 | 1280.59 | 666.6331 | -1.0047 | -282.264 |
| 0.7972 | 0.9929 | 1402.4 | 512.0797 | -1.3946 | -371.73 | 0.7972 | 0.9949 | 1408.95 | 506.3505 | -1.3747 | -362.326 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.7069 | 1.0433 | 1495.96 | 428.2986 | -1.4982 | -382.498 | 0.7069 | 1.0451 | 1502.48 | 423.8501 | -1.4773 | -373.238 |
| 0.6083 | 1.0823 | 1580.17 | 370.04 | -1.3435 | -361.027 | 0.6083 | 1.084 | 1586.09 | 366.6934 | -1.3238 | -352.268 |
| 0.5180 | 1.1112 | 1641.31 | 334.0646 | -1.2362 | -323.978 | 0.5180 | 1.1129 | 1647.45 | 331.0816 | -1.2171 | -316.35 |
| 0.4275 | 1.1337 | 1696.95 | 306.3091 | -1.0245 | -278.541 | 0.4275 | 1.1353 | 1702.96 | 303.7169 | -1.0072 | -271.985 |
| 0.3811 | 1.1436 | 1721.13 | 295.1775 | -0.9058 | -252.142 | 0.3811 | 1.1452 | 1727.07 | 292.741 | -0.8898 | -246.192 |
| 0.2586 | 1.1672 | 1775.21 | 271.8732 | -0.6881 | -176.399 | 0.2586 | 1.1688 | 1781.69 | 269.5297 | -0.6793 | -172.355 |
| 0.1469 | 1.1828 | 1817.77 | 255.8693 | -0.3018 | -102.070 | 0.1469 | 1.1844 | 1824.64 | 253.6095 | -0.2973 | -99.7701 |
| 0.0675 | 1.1931 | 1845.13 | 246.1934 | -0.103 | -47.5359 | 0.0675 | 1.1946 | 1852.16 | 244.0131 | -0.1002 | -46.437 |
| **T = 293.15 K** | | | | | | **T = 290.65 K** | | | | | |
| 0.8985 | 0.9168 | 1287.79 | 657.7041 | -0.9902 | -274.8 | 0.8985 | 0.9189 | 1294.84 | 649.0961 | -0.9749 | -267.275 |
| 0.7972 | 0.9968 | 1415.51 | 500.7068 | -1.3551 | -353.151 | 0.7972 | 0.9987 | 1421.97 | 495.2238 | -1.3346 | -344.033 |
| 0.7069 | 1.0469 | 1509.05 | 419.4411 | -1.4568 | -364.251 | 0.7069 | 1.0488 | 1515.55 | 415.1293 | -1.4365 | -355.377 |
| 0.6083 | 1.0858 | 1591.99 | 363.4005 | -1.3043 | -343.745 | 0.6083 | 1.0875 | 1597.86 | 360.1615 | -1.2845 | -335.267 |
| 0.5180 | 1.1145 | 1653.73 | 328.0794 | -1.1989 | -308.914 | 0.5180 | 1.1162 | 1660.03 | 325.1098 | -1.1795 | -301.572 |
| 0.4275 | 1.1369 | 1708.99 | 301.1504 | -0.9901 | -265.556 | 0.4275 | 1.1385 | 1715.03 | 298.6153 | -0.9709 | -259.157 |
| 0.3811 | 1.1468 | 1733.06 | 290.3229 | -0.8723 | -240.355 | 0.3811 | 1.1484 | 1739.26 | 287.8476 | -0.8591 | -234.598 |
| 0.2586 | 1.1704 | 1788.37 | 267.1542 | -0.6715 | -168.396 | 0.2586 | 1.172 | 1795.11 | 264.7921 | -0.6621 | -164.412 |
| 0.1469 | 1.1859 | 1831.88 | 251.2779 | -0.2929 | -97.5133 | 0.1469 | 1.1875 | 1839.5 | 248.8751 | -0.2866 | -95.2903 |
| 0.0675 | 1.1962 | 1859.6 | 241.7529 | -0.0985 | -45.3837 | 0.0675 | 1.1977 | 1867.41 | 239.4267 | -0.0959 | -44.2823 |
| **T = 288.15 K** | | | | | | | | | | | |
| 0.8985 | 0.9209 | 1301.89 | 640.6559 | -0.9599 | -259.961 | | | | | | |
| 0.7972 | 1.0006 | 1428.34 | 489.8894 | -1.3129 | -335.135 | | | | | | |
| 0.7069 | 1.0506 | 1521.96 | 410.9306 | -1.413 | -346.656 | | | | | | |
| 0.6083 | 1.0892 | 1603.56 | 357.0376 | -1.2599 | -326.909 | | | | | | |
| 0.5180 | 1.1178 | 1666.44 | 322.1373 | -1.1529 | -294.379 | | | | | | |
| 0.4275 | 1.1401 | 1721.17 | 296.0699 | -0.9448 | -252.874 | | | | | | |
| 0.3811 | 1.1501 | 1745.71 | 285.3171 | -0.8371 | -228.996 | | | | | | |
| 0.2586 | 1.1735 | 1802.17 | 262.3678 | -0.6396 | -160.464 | | | | | | |
| 0.1469 | 1.189 | 1847.26 | 246.4668 | -0.2659 | -92.9681 | | | | | | |
| 0.0675 | 1.1992 | 1875.83 | 236.9814 | -0.075 | -43.1657 | | | | | | |

## Ethanol (1) + 2-HEAL (2)

| $x_2$ | $\rho$ ($gcm^{-3}$) | u ($ms^{-1}$) | $\kappa_S$ ($TPa^{-1}$) | $V^E$ ($cm^3mol^{-1}$) | $\delta\kappa_S$ ($TPa^{-1}$) | $x_2$ | $\rho$ ($gcm^{-3}$) | u ($ms^{-1}$) | $\kappa_S$ ($TPa^{-1}$) | $V^E$ ($cm^3mol^{-1}$) | $\delta\kappa_S$ ($TPa^{-1}$) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **T = 323.15 K** | | | | | | **T = 320.65 K** | | | | | |
| 0.9528 | 0.8119 | 1116.74 | 987.6278 | -0.6991 | -136.966 | 0.9528 | 0.8148 | 1124.46 | 970.6462 | -0.6695 | -132.828 |
| 0.8109 | 0.9165 | 1248.98 | 699.4498 | -1.0649 | -296.262 | 0.8109 | 0.9185 | 1256.07 | 690.07 | -1.0315 | -287.372 |
| 0.7232 | 0.9675 | 1327.32 | 586.6752 | -1.1927 | -329.383 | 0.7232 | 0.9694 | 1334.06 | 579.6239 | -1.1767 | -319.925 |
| 0.6116 | 1.0207 | 1422.16 | 484.4009 | -1.2476 | -330.296 | 0.6116 | 1.0225 | 1428.58 | 479.2119 | -1.2305 | -321.216 |
| 0.5122 | 1.0596 | 1505.67 | 416.2924 | -1.1833 | -308.123 | 0.5122 | 1.0613 | 1511.9 | 412.2073 | -1.1681 | -299.936 |
| 0.4144 | 1.0921 | 1571.5 | 370.7736 | -1.066 | -264.815 | 0.4144 | 1.0937 | 1577.66 | 367.3457 | -1.0518 | -257.934 |
| 0.3151 | 1.12 | 1640.16 | 331.9018 | -0.8732 | -213.496 | 0.3151 | 1.1216 | 1646.05 | 329.0607 | -0.8619 | -208.022 |
| 0.2060 | 1.1456 | 1706.02 | 299.9154 | -0.5444 | -146.392 | 0.2060 | 1.1472 | 1711.76 | 297.4919 | -0.5369 | -142.691 |
| 0.1051 | 1.1673 | 1756.09 | 277.7947 | -0.2753 | -76.8694 | 0.1051 | 1.1689 | 1761.95 | 275.5722 | -0.3314 | -75.9746 |
| 0.0543 | 1.1756 | 1780.3 | 268.3824 | -0.0486 | -40.1422 | 0.0543 | 1.1771 | 1786.08 | 266.3084 | -0.0479 | -39.1378 |
| **T = 318.15 K** | | | | | | **T = 315.65 K** | | | | | |
| 0.9528 | 0.8171 | 1132.21 | 954.7086 | -0.6673 | -128.424 | 0.9528 | 0.8193 | 1140.04 | 939.1109 | -0.6715 | -124.387 |
| 0.8109 | 0.9205 | 1263.13 | 680.8949 | -1.0113 | -278.94 | 0.8109 | 0.9225 | 1270.23 | 671.8447 | -0.999 | -270.984 |
| 0.7232 | 0.9713 | 1340.82 | 572.6716 | -1.1548 | -310.96 | 0.7232 | 0.9732 | 1347.55 | 565.8589 | -1.1385 | -302.391 |
| 0.6116 | 1.0243 | 1435.02 | 474.0858 | -1.2086 | -312.575 | 0.6116 | 1.0261 | 1441.49 | 469.0153 | -1.192 | -304.331 |
| 0.5122 | 1.0631 | 1518.1 | 408.155 | -1.149 | -292.136 | 0.5122 | 1.0648 | 1524.22 | 404.2375 | -1.1327 | -284.58 |
| 0.4144 | 1.0954 | 1583.88 | 363.9006 | -1.0366 | -251.411 | 0.4144 | 1.0971 | 1590.12 | 360.4906 | -1.0214 | -245.16 |
| 0.3151 | 1.1232 | 1651.96 | 326.245 | -0.8487 | -202.784 | 0.3151 | 1.1249 | 1657.95 | 323.4024 | -0.8357 | -197.804 |
| 0.2060 | 1.1488 | 1717.53 | 295.0848 | -0.5305 | -139.146 | 0.2060 | 1.1503 | 1723.39 | 292.6993 | -0.5203 | -135.73 |
| 0.1051 | 1.1704 | 1767.83 | 273.3913 | -0.3275 | -73.1667 | 0.1051 | 1.1719 | 1773.71 | 271.2341 | -0.3191 | -71.3917 |
| 0.0543 | 1.1786 | 1791.89 | 264.2475 | -0.0488 | -38.1699 | 0.0543 | 1.1801 | 1797.73 | 262.1997 | -0.0421 | -37.2264 |

| T = 313.15 K | | | | | | T = 310.65 K | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.9528 | 0.8215 | 1147.85 | 923.894 | -0.6645 | -120.506 | 0.9528 | 0.8236 | 1155.65 | 909.1405 | -0.6555 | -116.758 |
| 0.8109 | 0.9245 | 1277.32 | 662.9697 | -0.9814 | -263.308 | 0.8109 | 0.9264 | 1284.44 | 654.2953 | -0.9636 | -255.941 |
| 0.7232 | 0.975 | 1354.28 | 559.2145 | -1.118 | -294.059 | 0.7232 | 0.9769 | 1361.05 | 552.5884 | -1.0982 | -286.164 |
| 0.6116 | 1.0279 | 1447.99 | 464 | -1.1699 | -296.374 | 0.6116 | 1.0297 | 1454.49 | 459.0583 | -1.1494 | -288.729 |
| 0.5122 | 1.0665 | 1530.33 | 400.3768 | -1.1111 | -277.254 | 0.5122 | 1.0682 | 1536.5 | 396.5357 | -1.0921 | -270.231 |
| 0.4144 | 1.0987 | 1596.33 | 357.1705 | -1.0011 | -239.049 | 0.4144 | 1.1004 | 1602.58 | 353.8425 | -0.9836 | -233.208 |
| 0.3151 | 1.1265 | 1663.97 | 320.6106 | -0.8187 | -192.948 | 0.3151 | 1.1281 | 1669.98 | 317.8556 | -0.8037 | -188.256 |
| 0.2060 | 1.1519 | 1729.28 | 290.305 | -0.5065 | -132.436 | 0.2060 | 1.1535 | 1735.2 | 287.9276 | -0.4937 | -129.257 |
| 0.1051 | 1.1734 | 1779.71 | 269.0639 | -0.3063 | -69.6848 | 0.1051 | 1.175 | 1785.78 | 266.874 | -0.3007 | -68.067 |
| 0.0543 | 1.1816 | 1803.58 | 260.1709 | -0.0332 | -36.2904 | 0.0543 | 1.1832 | 1809.51 | 258.1189 | -0.0327 | -35.4151 |
| T = 308.15 K | | | | | | T = 305.65 K | | | | | |
| 0.9528 | 0.8258 | 1163.56 | 894.4325 | -0.6493 | -113.267 | 0.9528 | 0.8279 | 1171.55 | 880.036 | -0.6453 | -109.984 |
| 0.8109 | 0.9284 | 1291.6 | 645.6673 | -0.9469 | -248.784 | 0.8109 | 0.9302 | 1298.77 | 637.3224 | -0.9201 | -241.787 |
| 0.7232 | 0.9788 | 1367.88 | 546.0219 | -1.0793 | -278.437 | 0.7232 | 0.9807 | 1374.71 | 539.5624 | -1.0617 | -270.999 |
| 0.6116 | 1.0315 | 1460.99 | 454.1887 | -1.1304 | -281.204 | 0.6116 | 1.0333 | 1467.54 | 449.3592 | -1.1124 | -273.973 |
| 0.5122 | 1.07 | 1542.68 | 392.7033 | -1.0735 | -263.359 | 0.5122 | 1.0717 | 1548.86 | 388.9578 | -1.0559 | -256.682 |
| 0.4144 | 1.1021 | 1608.83 | 350.557 | -0.9662 | -227.453 | 0.4144 | 1.1037 | 1615.16 | 347.3105 | -0.9496 | -221.887 |
| 0.3151 | 1.1297 | 1676.02 | 315.1218 | -0.7885 | -183.638 | 0.3151 | 1.1313 | 1682.11 | 312.4017 | -0.7739 | -179.181 |
| 0.2060 | 1.155 | 1741.13 | 285.5983 | -0.4805 | -126.091 | 0.2060 | 1.1566 | 1747.14 | 283.2444 | -0.4667 | -123.064 |
| 0.1051 | 1.1766 | 1791.91 | 264.6908 | -0.2973 | -66.4711 | 0.1051 | 1.1781 | 1798.12 | 262.5309 | -0.2941 | -64.9121 |
| 0.0543 | 1.1848 | 1815.54 | 256.0609 | -0.0323 | -34.5582 | 0.0543 | 1.1863 | 1821.71 | 254.0078 | -0.0309 | -33.7291 |
| T = 303.15 K | | | | | | T = 300.65 K | | | | | |
| 0.9528 | 0.83 | 1179.5 | 866.0162 | -0.6366 | -106.566 | 0.9528 | 0.8342 | 1195.37 | 838.9288 | -0.6204 | -116.812 |
| 0.8109 | 0.9321 | 1305.91 | 629.0874 | -0.9052 | -234.881 | 0.8109 | 0.9361 | 1320.29 | 612.8287 | -0.8955 | -236.501 |
| 0.7232 | 0.9825 | 1381.55 | 533.2541 | -1.0432 | -263.587 | 0.7232 | 0.9863 | 1395.26 | 520.8116 | -1.0228 | -262.752 |
| 0.6116 | 1.0351 | 1474.12 | 444.5821 | -1.0932 | -266.837 | 0.6116 | 1.0386 | 1487.33 | 435.2482 | -1.0819 | -264.626 |
| 0.5122 | 1.0734 | 1555.01 | 385.2761 | -1.038 | -250.06 | 0.5122 | 1.0768 | 1567.3 | 378.06 | -1.0294 | -247.274 |
| 0.4144 | 1.1054 | 1621.5 | 344.0699 | -0.933 | -216.408 | 0.4144 | 1.1087 | 1634.37 | 337.6643 | -0.9161 | -214.33 |
| 0.3151 | 1.1329 | 1688.23 | 309.7028 | -0.7578 | -174.768 | 0.3151 | 1.1361 | 1700.67 | 304.329 | -0.7542 | -173.2 |
| 0.2060 | 1.1582 | 1753.23 | 280.8915 | -0.4613 | -120.072 | 0.2060 | 1.1614 | 1765.69 | 276.1781 | -0.4586 | -119.537 |
| 0.1051 | 1.1797 | 1804.43 | 260.3445 | -0.2908 | -63.3878 | 0.1051 | 1.1828 | 1817.7 | 255.8847 | -0.2295 | -64.1651 |
| 0.0543 | 1.1879 | 1828.02 | 251.9174 | -0.0305 | -32.9313 | 0.0543 | 1.191 | 1841.27 | 247.6585 | -0.0305 | -34.2963 |

| T = 298.15 K | | | | | | T = 295.65 K | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.9528 | 0.8342 | 1195.37 | 838.9288 | -0.6238 | -100.163 | 0.9528 | 0.8363 | 1203.33 | 825.7877 | -0.6176 | -97.0294 |
| 0.8109 | 0.9361 | 1320.29 | 612.8287 | -0.8838 | -222.019 | 0.8109 | 0.9381 | 1327.54 | 604.8611 | -0.8703 | -215.813 |
| 0.7232 | 0.9863 | 1395.26 | 520.8116 | -1.0104 | -249.61 | 0.7232 | 0.9881 | 1402.16 | 514.759 | -0.9954 | -242.787 |
| 0.6116 | 1.0386 | 1487.33 | 435.2482 | -1.059 | -253.189 | 0.6116 | 1.0404 | 1494 | 430.6242 | -1.0427 | -246.589 |
| 0.5122 | 1.0768 | 1567.3 | 378.06 | -1.0041 | -237.355 | 0.5122 | 1.0785 | 1573.69 | 374.4049 | -0.988 | -231.258 |
| 0.4144 | 1.1087 | 1634.37 | 337.6643 | -0.901 | -205.904 | 0.4144 | 1.1103 | 1640.93 | 334.4872 | -0.884 | -200.777 |
| 0.3151 | 1.1361 | 1700.67 | 304.329 | -0.7297 | -166.291 | 0.3151 | 1.1378 | 1707.03 | 301.6142 | -0.7216 | -162.171 |
| 0.2060 | 1.1614 | 1765.69 | 276.1781 | -0.4498 | -114.294 | 0.2060 | 1.163 | 1772.21 | 273.7726 | -0.4444 | -111.48 |
| 0.1051 | 1.1828 | 1817.7 | 255.8847 | -0.2837 | -60.4635 | 0.1051 | 1.1844 | 1824.68 | 253.5877 | -0.2799 | -59.0346 |
| 0.0543 | 1.191 | 1841.27 | 247.6585 | -0.029 | -31.3705 | 0.0543 | 1.1926 | 1848.3 | 245.4484 | -0.0267 | -30.6068 |
| T = 293.15 K | | | | | | T = 290.65 K | | | | | |
| 0.9528 | 0.8384 | 1211.31 | 812.9019 | -0.6113 | -93.7828 | 0.9528 | 0.8405 | 1219.22 | 800.3835 | -0.6024 | -90.3967 |
| 0.8109 | 0.94 | 1334.85 | 597.0452 | -0.856 | -209.562 | 0.8109 | 0.9419 | 1342.02 | 589.4911 | -0.8408 | -203.225 |
| 0.7232 | 0.99 | 1409.11 | 508.7155 | -0.9804 | -236.04 | 0.7232 | 0.9918 | 1416.02 | 502.8485 | -0.9637 | -229.26 |
| 0.6116 | 1.0422 | 1500.75 | 426.0222 | -1.0265 | -240.025 | 0.6116 | 1.0439 | 1507.4 | 421.584 | -1.0094 | -233.4 |
| 0.5122 | 1.0802 | 1580.33 | 370.6809 | -0.9719 | -225.263 | 0.5122 | 1.0819 | 1586.29 | 367.3226 | -0.9549 | -218.968 |
| 0.4144 | 1.112 | 1647.67 | 331.2491 | -0.8687 | -195.72 | 0.4144 | 1.1136 | 1654.37 | 328.0994 | -0.8534 | -190.604 |
| 0.3151 | 1.1394 | 1713.61 | 298.882 | -0.7136 | -158.054 | 0.3151 | 1.1411 | 1720.32 | 296.1132 | -0.7046 | -153.966 |
| 0.2060 | 1.1646 | 1778.97 | 271.3226 | -0.4391 | -108.668 | 0.2060 | 1.1662 | 1785.86 | 268.8637 | -0.4317 | -105.819 |
| 0.1051 | 1.186 | 1832.11 | 251.1957 | -0.2771 | -57.6337 | 0.1051 | 1.1875 | 1839.89 | 248.7612 | -0.2732 | -56.1918 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.0543 | 1.1941 | 1855.78 | 243.1679 | -0.0266 | -29.8338 | 0.0543 | 1.1956 | 1863.74 | 240.7928 | -0.0243 | -29.0534 |
| **T = 288.15 K** | | | | | | | | | | | |
| 0.9528 | 0.8424 | 1226.96 | 788.5347 | -0.5876 | -86.2976 | | | | | | |
| 0.8109 | 0.9438 | 1349.17 | 582.0854 | -0.8236 | -196.675 | | | | | | |
| 0.7232 | 0.9937 | 1422.87 | 497.0662 | -0.9427 | -222.318 | | | | | | |
| 0.6116 | 1.0457 | 1514.04 | 417.1749 | -0.9845 | -226.652 | | | | | | |
| 0.5122 | 1.0836 | 1590.84 | 364.6515 | -0.9282 | -211.878 | | | | | | |
| 0.4144 | 1.1153 | 1661.25 | 324.8915 | -0.8317 | -185.424 | | | | | | |
| 0.3151 | 1.1427 | 1727.17 | 293.3578 | -0.6829 | -149.727 | | | | | | |
| 0.2060 | 1.1678 | 1792.94 | 266.379 | -0.4087 | -102.841 | | | | | | |
| 0.1051 | 1.1891 | 1847.99 | 246.2535 | -0.2527 | -54.6536 | | | | | | |
| 0.0543 | 1.1972 | 1872.29 | 238.2797 | -0.0045 | -28.2339 | | | | | | |