

附表 16 饱和水和饱和水蒸气热力性质表(按温度排列)

| 温度<br>℃ | 压力        | 比体积 $m^3/kg$ |         | 比焓 $kJ/kg$ |         | 汽化潜      | 比熵 $kJ/(kg \cdot K)$ |        |
|---------|-----------|--------------|---------|------------|---------|----------|----------------------|--------|
| $t$     | $p$       | 液体           | 蒸汽      | 液体         | 蒸汽      | $kJ/kg$  | 液体                   | 蒸汽     |
|         |           | $v'$         | $v''$   | $h'$       | $h''$   | $\gamma$ | $s'$                 | $s''$  |
| 0.00    | 0.0006112 | 0.00100022   | 206.154 | -0.05      | 2500.51 | 2500.6   | -0.00                | 9.1544 |
| 0.01    | 0.0006117 | 0.00100021   | 206.012 | 0.00       | 2500.53 | 2500.5   | 0.000                | 9.1541 |
| 1       | 0.0006571 | 0.00100018   | 192.464 | 4.18       | 2502.35 | 2498.2   | 0.015                | 9.1278 |
| 2       | 0.0007059 | 0.00100013   | 179.787 | 8.39       | 2504.19 | 2495.8   | 0.030                | 9.1014 |
| 3       | 0.0007580 | 0.00100009   | 168.041 | 12.61      | 2506.03 | 2493.4   | 0.045                | 9.0752 |
| 4       | 0.0008135 | 0.00100008   | 157.151 | 16.82      | 2507.87 | 2491.1   | 0.061                | 9.0493 |
| 5       | 0.0008725 | 0.00100008   | 147.048 | 21.02      | 2509.71 | 2488.7   | 0.076                | 9.0236 |
| 6       | 0.0009352 | 0.00100010   | 137.670 | 25.22      | 2511.55 | 2486.3   | 0.091                | 8.9982 |
| 7       | 0.0010019 | 0.00100014   | 128.961 | 29.42      | 2513.39 | 2484.0   | 0.1063               | 8.9730 |
| 8       | 0.0010728 | 0.00100019   | 120.868 | 33.62      | 2515.23 | 2481.6   | 0.1213               | 8.9480 |
| 9       | 0.0011480 | 0.00100026   | 113.342 | 37.81      | 2517.06 | 2479.3   | 0.1362               | 8.9233 |
| 10      | 0.0012279 | 0.00100034   | 106.341 | 42.00      | 2518.90 | 2476.9   | 0.151                | 8.8988 |
| 11      | 0.0013126 | 0.00100043   | 99.825  | 46.19      | 2520.74 | 2474.5   | 0.1658               | 8.8745 |
| 12      | 0.0014025 | 0.00100054   | 93.756  | 50.38      | 2522.57 | 2472.2   | 0.1805               | 8.8504 |
| 13      | 0.0014977 | 0.00100066   | 88.101  | 54.57      | 2524.41 | 2469.8   | 0.1952               | 8.8265 |
| 14      | 0.0015985 | 0.00100080   | 82.828  | 58.76      | 2526.24 | 2467.5   | 0.2098               | 8.8029 |
| 15      | 0.0017053 | 0.00100094   | 77.910  | 62.95      | 2528.07 | 2465.1   | 0.2243               | 8.7794 |
| 16      | 0.0018183 | 0.00100110   | 73.320  | 67.13      | 2529.90 | 2462.8   | 0.238                | 8.7562 |
| 17      | 0.0019377 | 0.00100127   | 69.034  | 71.32      | 2531.72 | 2460.4   | 0.253                | 8.7331 |
| 18      | 0.0020640 | 0.00100145   | 65.029  | 75.50      | 2533.55 | 2458.1   | 0.267                | 8.7103 |
| 温度<br>℃ | 压力        | 比体积 $m^3/kg$ |         | 比焓 $kJ/kg$ |         | 汽化潜      | 比熵 $kJ/(kg \cdot K)$ |        |
| $t$     | $p$       | 液体           | 蒸汽      | 液体         | 蒸汽      | $kJ/kg$  | 液体                   | 蒸汽     |
|         |           | $v'$         | $v''$   | $h'$       | $h''$   | $\gamma$ | $s'$                 | $s''$  |
| 19      | 0.002197  | 0.00100165   | 61.287  | 79.68      | 2535.37 | 2455.7   | 0.2820               | 8.6877 |
| 20      | 0.002338  | 0.00100185   | 57.786  | 83.86      | 2537.20 | 2453.3   | 0.2963               | 8.6652 |
| 22      | 0.002644  | 0.00100229   | 51.445  | 92.23      | 2540.84 | 2448.6   | 0.3247               | 8.6210 |
| 24      | 0.002984  | 0.00100276   | 45.884  | 100.59     | 2544.47 | 2443.9   | 0.3530               | 8.5774 |
| 26      | 0.003362  | 0.00100328   | 40.997  | 108.95     | 2548.10 | 2439.2   | 0.3810               | 8.5347 |
| 28      | 0.003781  | 0.00100383   | 36.694  | 117.32     | 2551.73 | 2434.4   | 0.4089               | 8.4927 |
| 30      | 0.004245  | 0.00100442   | 32.899  | 125.68     | 2555.35 | 2429.7   | 0.4366               | 8.4514 |
| 35      | 0.005626  | 0.00100605   | 25.222  | 146.59     | 2564.38 | 2417.8   | 0.5050               | 8.3511 |
| 40      | 0.007381  | 0.00100789   | 19.529  | 167.50     | 2573.36 | 2405.9   | 0.5723               | 8.2551 |
| 45      | 0.009589  | 0.00100993   | 15.2636 | 188.42     | 2582.30 | 2393.9   | 0.6386               | 8.1630 |

|                           |          |                            |         |                   |          |                |   |        |
|---------------------------|----------|----------------------------|---------|-------------------|----------|----------------|---|--------|
| 50                        | 0.012344 | 0.00101216                 | 12.0365 | 209.33            | 2591.19  | 2381.9         | 0.7038                                  | 8.0745 |
| 55                        | 0.015752 | 0.00101455                 | 9.5723  | 230.24            | 2600.02  | 2369.8         | 0.7680                                  | 7.9896 |
| 60                        | 0.019933 | 0.00101713                 | 7.6740  | 251.15            | 2608.79  | 2357.6         | 0.8312                                  | 7.9080 |
| 65                        | 0.025024 | 0.00101986                 | 6.1992  | 272.08            | 2617.48  | 2345.4         | 0.8935                                  | 7.8295 |
| 70                        | 0.031178 | 0.00102276                 | 5.0443  | 293.01            | 2626.10  | 2333.1         | 0.9550                                  | 7.7540 |
| 75                        | 0.038565 | 0.00102582                 | 4.1330  | 313.96            | 2634.63  | 2320.7         | 1.0156                                  | 7.6812 |
| 80                        | 0.047376 | 0.00102903                 | 3.4086  | 334.93            | 2643.06  | 2308.1         | 1.0753                                  | 7.6112 |
| 85                        | 0.057818 | 0.00103240                 | 2.8288  | 355.92            | 2651.40  | 2295.5         | 1.1343                                  | 7.5436 |
| 90                        | 0.070121 | 0.00103593                 | 2.3616  | 376.94            | 2659.63  | 2282.7         | 1.1926                                  | 7.4783 |
| 温度 $^{\circ}\text{C}$     | 压力       | 比体积 $\text{m}^3/\text{kg}$ |         | 比焓 $\text{kJ/kg}$ |          | 汽化潜            | 比熵 $\text{kJ}/(\text{kg}\cdot\text{K})$ |        |
| $t$                       | $p$      | 液体                         | 蒸汽      | 液体                | 蒸汽       | $\text{kJ/kg}$ | 液体                                      | 蒸汽     |
|                           |          | $v'$                       | $v''$   | $h'$              | $h''$    | $\gamma$       | $s'$                                    | $s''$  |
| 95                        | 0.084533 | 0.00103961                 | 1.9827  | 397.98            | 2667.73  | 2269.7         | 1.2501                                  | 7.4154 |
| 100                       | 0.101325 | 0.00104344                 | 1.6736  | 419.06            | 2675.71  | 2256.6         | 1.3069                                  | 7.3545 |
| 110                       | 0.143243 | 0.00105156                 | 1.2106  | 461.33            | 2691.26  | 2229.9         | 1.4186                                  | 7.2386 |
| 120                       | 0.198483 | 0.00106031                 | 0.89219 | 503.76            | 2706.18  | 2202.4         | 1.5277                                  | 7.1297 |
| 130                       | 0.270018 | 0.00106968                 | 0.66873 | 546.38            | 2720.39  | 2174.0         | 1.6346                                  | 7.0272 |
| 140                       | 0.361190 | 0.00107972                 | 0.50900 | 589.21            | 2733.81  | 2144.6         | 1.7393                                  | 6.9302 |
| 150                       | 0.47571  | 0.00109046                 | 0.39286 | 632.28            | 2746.35• | 2114-1         | 1.8420                                  | 6.8381 |
| 160                       | 0.61766  | 0.00110193                 | 0-30709 | 675.62            | 2757.92  | 2082-3         | 1.9429                                  | 6.7502 |
| 170                       | 0.79147  | 0.00111420                 | 0.24283 | 719.25            | 2768.42  | 2049.2         | 2.0420                                  | 6.6661 |
| 180                       | 1.00193  | 0.00112732                 | 0.19403 | 763.22            | 2777.74  | 2014-5         | 2.1396                                  | 6.5852 |
| 190                       | 1.25417  | 0.00114136                 | 0.15650 | 807.56            | 2785.80  | 1978-2         | 2.2358                                  | 6.5071 |
| 200                       | 1.55366  | 0.00115641                 | 0.12732 | 852.34            | 2792.47  | 1940.1         | 2.3307                                  | 6.4312 |
| 210                       | 1.90617  | 0.00117258                 | 0.10438 | 897.62            | 2797.65  | 1900.0         | 2.4245                                  | 6.3571 |
| 220                       | 2.31783  | 0.00119000                 | 0.08615 | 943.46            | 2801.20  | 857.7          | 2.5175                                  | 6.2846 |
| 230                       | 2.79505  | 0.00120882                 | 0.07155 | 989.95            | 2803.00  | 813.0          | 2.6096                                  | 6.2130 |
| 240                       | 3.34459  | 0.00122922                 | 0.05&-7 | 1037.2            | 2802.88  | 765.7          | 2.7013                                  | 6.1422 |
| 250                       | 3.97351  | 0.00125145                 | 0.05011 | 1085.3            | 2800.66  | 715-4          | 2.7926                                  | 6.0716 |
| 260                       | 4.68923  | 0.00127579                 | 0.04219 | 1134.3            | 2796.14  | 661.8          | 2.8837                                  | 6.0007 |
| 270                       | 5.49956  | 0.00130262                 | 0.03563 | 1184.5            | 2789.05  | 604.5          | 2.9751                                  | 5.9292 |
| 温<br>度 $^{\circ}\text{C}$ | 压力       | 比体积 $\text{m}^3/\text{kg}$ |         | 比焓 $\text{kJ/kg}$ |          | 汽化潜            | 比熵 $\text{kJ}/(\text{kg}\cdot\text{K})$ |        |
| $t$                       | $p$      | 液体                         | 蒸汽      | 液体                | 蒸汽       | $\text{kJ/kg}$ | 液体                                      | 蒸汽     |
|                           |          | $v'$                       | $v''$   | $h'$              | $h''$    | $\gamma$       | $s'$                                    | $s''$  |
| 280                       | 6.41273  | 0.00133242                 | 0.03016 | 1236.0            | 2779.08  | 1543.1         | 3.0668                                  | 5.8564 |
| 290                       | 7.43746  | 0.00136582                 | 0.02556 | 1289.1            | 2765.81  | 1476.7         | 3.1594                                  | 5.7817 |
| 300                       | 8.58308  | 0.00140369                 | 0.02166 | 1344.0            | 2748.71  | 1404.7         | 3.2533                                  | 5.7042 |
| 310                       | 9.8597   | 0.00144728                 | 0.01834 | 1401.2            | 2727.01  | 1325.9         | 3.3490                                  | 5.6226 |
| 320                       | 11.278   | 0.00149844                 | 0.01547 | 1461.2            | 2699.72  | 1238.5         | 3.4475                                  | 5.5356 |

|        |        |            |         |        |         |        |        |        |
|--------|--------|------------|---------|--------|---------|--------|--------|--------|
| 330    | 12.851 | 0.00156008 | 0.01298 | 1524.9 | 2665.30 | 1140.4 | 3.5500 | 5.4408 |
| 340    | 14.593 | 0.00163728 | 0.01079 | 1593.7 | 2621.32 | 1027.6 | 3.6586 | 5.3345 |
| 350    | 16.521 | 0.00174008 | 0.00881 | 1670.3 | 2563.39 | 893.0  | 3.7773 | 5.2104 |
| 360    | 18.657 | 0.00189423 | 0.00695 | 1761.1 | 2481.68 | 720.6  | 3.9155 | 5.0536 |
| 370    | 21.033 | 0.00221480 | 0.00498 | 1891.7 | 2338.79 | 447.1  | 4.1125 | 4.8076 |
| 371    | 21.286 | 0.00227969 | 0.00473 | 1911.8 | 2314.11 | 402.3  | 4.1429 | 4.7674 |
| 372    | 21.542 | 0.00236530 | 0.00445 | 1936.1 | 2282.99 | 346.9  | 4.1796 | 4.7173 |
| 373    | 21.802 | 0.00249600 | 0.00408 | 1968.8 | 2237.98 | 269.2  | 4.2292 | 4.6458 |
| 373.99 | 22.064 | 0.003106   | 0.00310 | 2085.9 | 2085.9  | 0.0    | 4.4092 | 4.4092 |

本表引自严家录、余晓福编著《水和水蒸汽热力性质图表》，高等教育出版社，1995

附表 17 饱和水和饱和水蒸气热力性质表(按压力排列)

| 压力<br><i>MPa</i> | 温度℃      | 比体积 $m^3/kg$ |         | 比焓 $kJ/kg$ |         | 汽化潜热     | 比熵 $kJ/(kg \cdot K)$ |        |
|------------------|----------|--------------|---------|------------|---------|----------|----------------------|--------|
| <i>p</i>         | <i>t</i> | 液 体          | 蒸 汽     | 液 体        | 蒸 汽     | $kJ/kg$  | 液 体                  | 蒸 汽    |
|                  |          | $v'$         | $v''$   | $h'$       | $h''$   | $\gamma$ | $s'$                 | $s''$  |
| 0.0010           | 6.9491   | 0.001000     | 129.185 | 29.21      | 2513.29 | 2484.1   | 0.1056               | 8.9735 |
| 0.0020           | 17.540   | 0.001001     | 67.008  | 73.58      | 2532.71 | 2459.1   | 0.2611               | 8.7220 |
| 0.0030           | 24.114   | 0.001002     | 45.666  | 101.07     | 2544.68 | 2443.6   | 0.3546               | 8.5758 |
| 0.0040           | 28.953   | 0.001004     | 34.796  | 121.30     | 2553.45 | 2432.2   | 0.4221               | 8.4725 |
| 0.0050           | 32.879   | 0.001005     | 28.101  | 137.72     | 2560.55 | 2422.8   | 0.4761               | 8.3930 |
| 0.0060           | 36.166   | 0.001006     | 23.738  | 151.47     | 2566.48 | 2415.0   | 0.5208               | 8.3283 |
| 0.0070           | 38.996   | 0.001007     | 20.528  | 163.31     | 2571.56 | 2408.3   | 0.5589               | 8.2737 |
| 0.0080           | 41.507   | 0.001008     | 18.102  | 173.81     | 2576.06 | 2402.3   | 0.5924               | 8.2266 |
| 0.0090           | 43.790   | 0.001009     | 16.204  | 183.36     | 2580.15 | 2396.8   | 0.6226               | 8.1854 |
| 0.010            | 45.798   | 0.001010     | 14.673  | 191.76     | 2583.72 | 2392.0   | 0.6490               | 8.1481 |
| 0.015            | 53.970   | 0.001014     | 10.022  | 225.93     | 2598.21 | 2372.3   | 0.7548               | 8.0065 |
| 0.020            | 60.065   | 0.001017     | 7.6497  | 251.43     | 2608.90 | 2357.5   | 0.8320               | 7.9068 |
| 0.025            | 64.972   | 0.001019     | 6.2047  | 271.96     | 2617.43 | 2345.5   | 0.8932               | 7.8298 |
| 0.030            | 69.104   | 0.001022     | 5.2296  | 289.26     | 2624.56 | 2335.3   | 0.9440               | 7.7671 |
| 0.040            | 75.872   | 0.001026     | 3.9939  | 317.61     | 2636.10 | 2318.5   | 1.0260               | 7.6688 |
| 0.050            | 81.338   | 0.001029     | 3.2409  | 340.55     | 2645.31 | 2304.8   | 1.0912               | 7.5928 |
| 0.060            | 85.949   | 0.001033     | 2.7324  | 359.91     | 2652.97 | 2293.1   | 1.1454               | 7.5310 |
| 0.070            | 89.955   | 0.001035     | 2.3654  | 376.75     | 2659.55 | 2282.8   | 1.1921               | 7.4789 |
| 压力 <i>MPa</i>    | 温度℃      | 比体积 $m^3/kg$ |         | 比焓 $kJ/kg$ |         | 汽化潜热     | 比熵 $kJ/(kg \cdot K)$ |        |
| <i>p</i>         | <i>t</i> | 液 体          | 蒸 汽     | 液 体        | 蒸 汽     | $kJ/kg$  | 液 体                  | 蒸 汽    |

|             |                | $v'$         | $v''$  | $h'$       | $h''$   | $\gamma$ | $s'$                 | $s''$  |
|-------------|----------------|--------------|--------|------------|---------|----------|----------------------|--------|
| 0.080       | 93.510         | 0.00103      | 2.0876 | 391.71     | 2665.33 | 2273.6   | 1.2330               | 7.4339 |
| 0.090       | 96.712         | 0.00104      | 1.8698 | 405.20     | 2670.48 | 2265.3   | 1.2696               | 7.3943 |
| 0.10        | 99.634         | 0.00104      | 1.6943 | 417.52     | 2675.14 | 2257.6   | 1.3028               | 7.3589 |
| 0.12        | 104.81         | 0.00104      | 1.4287 | 439.37     | 2683-26 | 2243.9   | 1.3609               | 7.2978 |
| 0.14        | 109.31         | 0.00105      | 1.2368 | 458.44     | 2690.22 | 2231.8   | 1.4110               | 7.2462 |
| 0.16        | 113.32         | 0.00105      | 1.0915 | 475.42     | 2696.29 | 2220.9   | 1.4552               | 7.2016 |
| 0.18        | 116.94         | 0.00105      | 0.9776 | 490.76     | 2701.69 | 2210.9   | 1.4946               | 7.1623 |
| 0.20        | 120.24         | 0.00106      | 0.8858 | 504.78     | 2706.53 | 2201.7   | 1.5303               | 7.1272 |
| 0.25        | 127.44         | 0.00106      | 0.7187 | 535.47     | 2716-83 | 2181.4   | 1.6075               | 7.0528 |
| 0.30        | 133.55         | 0.00107      | 0.6058 | 561.58     | 2725.26 | 2163.7   | 1.6721               | 6.9921 |
| 0.35        | 138.89         | 0.00107      | 0.5242 | 584.45     | 2732.37 | 2147.9   | 1.7278               | 6.9407 |
| 0.40        | 143.64         | 0.00108      | 0.4624 | 604.87     | 2738.49 | 2133.6   | 1.7769               | 6.8961 |
| 0.50        | 151.86         | 0.00109      | 0.3748 | 640.35     | 2748.59 | 2108.2   | 1.8610               | 6.8214 |
| 0.60        | 158.86         | 0.00110      | 0.3156 | 670.67     | 2756.66 | 2086.0   | 1.9315               | 6.7600 |
| 0.70        | 164.98         | 0.00110      | 0.2728 | 697.32     | 2763.29 | 2066.0   | 1.9925               | 6.7079 |
| 0.80        | 170.44         | 0.00111      | 0.2403 | 721.20     | 2768.86 | 2047.7   | 2.0464               | 6.6625 |
| 0.90        | 175.38         | 0.00112      | 0.2149 | 742.90     | 2773.59 | 2030.7   | 2.0948               | 6.6222 |
| 1.00        | 179.91         | 0.00112      | 0.1943 | 762.84     | 2777.67 | 2014.8   | 2.1388               | 6.5859 |
| 压力<br>$MPa$ | 温度 $^{\circ}C$ | 比体积 $m^3/kg$ |        | 比焓 $kJ/kg$ |         | 汽化潜热     | 比熵 $kJ/(kg \cdot K)$ |        |
| $p$         | $t$            | 液 体          | 蒸 汽    | 液 体        | 蒸 汽     | $kJ/kg$  | 液 体                  | 蒸 汽    |
|             |                | $v'$         | $v''$  | $h'$       | $h''$   | $\gamma$ | $s'$                 | $s''$  |
| 1.10        | 184.10         | 0.00113      | 0.1774 | 781.35     | 2781.21 | 999.9    | 2.1792               | 6.5529 |
| 1.20        | 187.99         | 0.00113      | 0.1632 | 798.64     | 2784.29 | 985.7    | 2.2166               | 6.5225 |
| 1.30        | 191.64         | 0.00114      | 0.1512 | 814.89     | 2786.99 | 972.1    | 2.2515               | 6.4944 |
| 1.40        | 195.07         | 0.00114      | 0.1407 | 830.24     | 2789.37 | 959.1    | 2.2841               | 6.4683 |
| 1.50        | 198.32         | 0.00115      | 0.1317 | 844.82     | 2791.46 | 946.6    | 2.3149               | 6.4437 |
| 1.60        | 201.41         | 0.00115      | 0.1237 | 858.69     | 2793.29 | 934.6    | 2.3440               | 6.4206 |
| 1.70        | 204.34         | 0.00116      | 0.1166 | 871.96     | 2794.91 | 923.0    | 2.3716               | 6.3988 |
| 1.80        | 207.15         | 0.00116      | 0.1103 | 884.67     | 2796.33 | 911.7    | 2.3979               | 6.3781 |
| 1.90        | 209.83         | 0.00117      | 0.1047 | 896.88     | 2797.58 | 900.7    | 2.4230               | 6.3583 |
| 2.00        | 212.41         | 0.00117      | 0.0995 | 908.64     | 2798.66 | 890.0    | 2.4471               | 6.3395 |
| 2.20        | 217.28         | 0.00118      | 0.0907 | 930.97     | 2800.41 | 1869.4   | 2.4924               | 6.3041 |
| 2.40        | 221.82         | 0.00119      | 0.0832 | 951.91     | 2801.67 | 1849.8   | 2.5344               | 6.2714 |
| 2.60        | 226.08         | 0.00120      | 0.0768 | 971.67     | 2802.51 | 1830.8   | 2.5736               | 6.2409 |
| 2.80        | 230.09         | 0.00120      | 0.0714 | 990.41     | 2803.01 | 1812.6   | 2.6105               | 6.2123 |
| 3.00        | 233.89         | 0.00121      | 0.0666 | 1008.2     | 2803.19 | 1794.9   | 2.6454               | 6.1854 |
| 3.50        | 242.59         | 0.00123      | 0.0570 | 1049.6     | 2802.51 | 1752.9   | 2.7250               | 6.1238 |
| 4.00        | 250.39         | 0.00125      | 0.0497 | 1087.2     | 2800.53 | 1713.4   | 2.7962               | 6.0688 |

|             |                |              |        |            |         |          |                      |        |
|-------------|----------------|--------------|--------|------------|---------|----------|----------------------|--------|
| 5.00        | 263.98         | 0.00128      | 0.0394 | 1154.2     | 2793.64 | 1639.5   | 2.9201               | 5.9724 |
| 压力<br>$MPa$ | 温度 $^{\circ}C$ | 比体积 $m^3/kg$ |        | 比焓 $kJ/kg$ |         | 汽化潜热     | 比熵 $kJ/(kg \cdot K)$ |        |
| $p$         | $t$            | 液 体          | 蒸 汽    | 液 体        | 蒸 汽     | $kJ/kg$  | 液 体                  | 蒸 汽    |
|             |                | $v'$         | $v''$  | $h'$       | $h''$   | $\gamma$ | $s'$                 | $s''$  |
| 6.00        | 275.62         | 0.00131      | 0.0324 | 1213.3     | 2783.8  | 1570.5   | 3.0266               | 5.8885 |
| 7.00        | 285.86         | 0.00135      | 0.0273 | 1266.9     | 2771.7  | 1504.8   | 3.1210               | 5.8129 |
| 8.00        | 295.04         | 0.00138      | 0.0235 | 1316.5     | 2757.7  | 1441.2   | 3.2066               | 5.7430 |
| 9.00        | 303.38         | 0.00141      | 0.0204 | 1363.1     | 2741.9  | 1378.9   | 3.2854               | 5.6771 |
| 10.0        | 311.03         | 0.00145      | 0.0180 | 1407.2     | 2724.4  | 1317.2   | 3.3591               | 5.6139 |
| 11.0        | 318.11         | 0.00148      | 0.0159 | 1449.6     | 2705.3  | 1255.7   | 3.4287               | 5.5525 |
| 12.0        | 324.71         | 0.00152      | 0.0142 | 1490.7     | 2684.5  | 1193.8   | 3.4952               | 5.4920 |
| 13.0        | 330.89         | 0.00156      | 0.0127 | 1530.8     | 2661.8  | 1131.0   | 3.5594               | 5.4318 |
| 14.0        | 336.70         | 0.00160      | 0.0114 | 1570.4     | 2637.0  | 1066.7   | 3.6220               | 5.3711 |
| 15.0        | 342.19         | 0.00165      | 0.0103 | 1609.8     | 2610.0  | 1000.2   | 3.6836               | 5.3091 |
| 16.0        | 347.39         | 0.00170      | 0.0093 | 1649.4     | 2580.2  | 930.8    | 3.7451               | 5.2450 |
| 17.0        | 352.33         | 0.00177      | 0.0083 | 1690.0     | 2547.0  | 857.1    | 3.8073               | 5.1776 |
| 18.0        | 357.03         | 0.00184      | 0.0075 | 1732.0     | 2509.4  | 777.4    | 3.8715               | 5.1051 |
| 19.0        | 361.51         | 0.00192      | 0.0066 | 1776.9     | 2465.8  | 688.9    | 3.9395               | 5.0250 |
| 20.0        | 365.78         | 0.00203      | 0.0058 | 1827.2     | 2413.0  | 585.9    | 4.0153               | 4.9322 |
| 21.0        | 369.86         | 0.00220      | 0.0050 | 1889.2     | 2341.6  | 452.4    | 4.1088               | 4.8124 |
| 22.0        | 373.75         | 0.00270      | 0.0036 | 2013.0     | 2084.0  | 71.0     | 4.2969               | 4.4066 |
| 22.064      | 373.99         | 0.00310      | 0.0031 | 2085.9     | 2085.9  | 0.0      | 4.4092               | 4.4092 |

本表引自严家录、余晓福编著《水和水蒸汽热力性质图表》，高等教育出版社，1995

附表18 未饱和水与过热水蒸气热力性质表

| $p$ | 0.001MPa                 |         |                   | 0.005MPa                  |         |                   |
|-----|--------------------------|---------|-------------------|---------------------------|---------|-------------------|
|     | $(t_s = 6.949^{\circ}C)$ |         |                   | $(t_s = 32.879^{\circ}C)$ |         |                   |
|     | $v'$                     | $h'$    | $s'$              | $v'$                      | $h'$    | $s'$              |
|     | 0.001001                 | 29.21   | 0.1056            | 0.0010053                 | 137.72  | 0.4761            |
|     | $m^3/kg$                 | $kJ/kg$ | $kJ/(kg \cdot K)$ | $m^3/kg$                  | $kJ/kg$ | $kJ/(kg \cdot K)$ |
|     | $v''$                    | $h''$   | $s'$              | $v''$                     | $h''$   | $s'$              |

|           |                 |                |                          |                 |                |                          |
|-----------|-----------------|----------------|--------------------------|-----------------|----------------|--------------------------|
|           | 0.001001        | 29.21          | 0.1056                   | 28.191          | 2560.6         | 8.3930                   |
|           | $m^3/kg$        | $kJ/kg$        | $kJ/(kg \cdot K)$        | $m^3/kg$        | $kJ/kg$        | $kJ/(kg \cdot K)$        |
| $t$<br>°C | $v$<br>$m^3/kg$ | $h$<br>$kJ/kg$ | $s$<br>$kJ/(kg \cdot K)$ | $v$<br>$m^3/kg$ | $h$<br>$kJ/kg$ | $s$<br>$kJ/(kg \cdot K)$ |
| 0         | 0.001002        | -0.05          | -0.0002                  | 0.0010002       | -0.05          | -0.0002                  |
| 10        | 130.598         | 2519.0         | 8.9938                   | 0.0010003       | 42.01          | 0.1510                   |
| 20        | 135.226         | 2537.7         | 9.0588                   | 0.0010018       | 83.87          | 0.2963                   |
| 40        | 144.475         | 2575.2         | 9.1823                   | 28.854          | 2574.0         | 8.43466                  |
| 60        | 153.717         | 2612.7         | 9.2984                   | 30.712          | 2611.8         | 8.5537                   |
| 80        | 162.956         | 2650.3         | 9.4080                   | 32.566          | 2649.7         | 8.6639                   |
| 100       | 172.192         | 2688.0         | 9.5120                   | 34.418          | 2687.5         | 8.7682                   |
| 120       | 181.426         | 2725.9         | 9.6109                   | 36.269          | 2725.5         | 8.8674                   |
| 140       | 190.660         | 2764.0         | 9.7054                   | 38.118          | 2763.7         | 8.9620                   |
| 160       | 199.893         | 2802.3         | 9.7959                   | 39.967          | 2802.0         | 9.0526                   |
| 180       | 209.126         | 2840.7         | 9.8827                   | 41.815          | 2840.5         | 9.1396                   |
| 200       | 218.358         | 2879.4         | 9.9662                   | 43.662          | 2879.2         | 9.2232                   |
| 220       | 227.590         | 2918.3         | 10.0468                  | 45.510          | 2918.2         | 9.3038                   |
| 240       | 236.821         | 2957.5         | 10.1246                  | 47.357          | 2957.3         | 9.3816                   |
| 260       | 246.053         | 2996.8         | 10.1998                  | 49.204          | 2996.7         | 9.4569                   |
| 280       | 255.284         | 3036.4         | 10.2727                  | 51.051          | 3036.3         | 9.5298                   |
| 300       | 264.515         | 3076.2         | 10.3434                  | 52.898          | 3076.1         | 9.6005                   |
| 350       | 287.592         | 3176.8         | 10.5117                  | 57.514          | 3176.7         | 9.7688                   |
| 400       | 310.669         | 3278.9         | 10.6692                  | 62.131          | 3278.8         | 9.9264                   |
| 450       | 333.746         | 3382.4         | 10.8176                  | 66.747          | 3382.4         | 10.0747                  |
| 500       | 356.823         | 3487.5         | 10.9581                  | 71.362          | 3487.5         | 10.2153                  |
| 550       | 379.900         | 3594.4         | 11.0921                  | 75.978          | 3594.4         | 10.3493                  |
| 600       | 402.976         | 3703.4         | 11.2206                  | 80.594          | 3703.4         | 10.4778                  |
| $p$       | 0.010MPa        |                |                          | 0.10MPa         |                |                          |

|                         |                                |                              |   |                                |                              |   |
|-------------------------|--------------------------------|------------------------------|---|--------------------------------|------------------------------|---|
|                         | $(t_s = 45.799^\circ\text{C})$ |                              |   | $(t_s = 99.634^\circ\text{C})$ |                              |   |
|                         | $v'$                           | $h'$                         | $s'$  | $v'$                           | $h'$                         | $s'$  |
|                         | 0.0010103                      | 191.76                       | 1.3028                                      | 0.0010431                      | 417.52                       | 1.3028                                      |
|                         | $\text{m}^3/\text{kg}$         | $\text{kJ}/\text{kg}$        | $\text{kJ}/(\text{kg}\cdot\text{K})$        | $\text{m}^3/\text{kg}$         | $\text{kJ}/\text{kg}$        | $\text{kJ}/(\text{kg}\cdot\text{K})$        |
|                         | $v''$                          | $h''$                        | $s'$  | $v''$                          | $h''$                        | $s'$  |
|                         | 14.673                         | 2583.7                       | 8.1481                                      | 1.6943                         | 2675.1                       | 7.3589                                      |
|                         | $\text{m}^3/\text{kg}$         | $\text{kJ}/\text{kg}$        | $\text{kJ}/(\text{kg}\cdot\text{K})$        | $\text{m}^3/\text{kg}$         | $\text{kJ}/\text{kg}$        | $\text{kJ}/(\text{kg}\cdot\text{K})$        |
| $t$<br>$^\circ\text{C}$ | $v$<br>$\text{m}^3/\text{kg}$  | $h$<br>$\text{kJ}/\text{kg}$ | $s$<br>$\text{kJ}/(\text{kg}\cdot\text{K})$ | $v$<br>$\text{m}^3/\text{kg}$  | $h$<br>$\text{kJ}/\text{kg}$ | $s$<br>$\text{kJ}/(\text{kg}\cdot\text{K})$ |
| 0                       | 0.0010002                      | -0.04                        | -0.0002                                     | 0.0010002                      | 0.05                         | -0.0002                                     |
| 10                      | 0.0010003                      | 42.01                        | 0.1510                                      | 0.0010003                      | 42.10                        | 0.1510                                      |
| 20                      | 0.0010018                      | 83.87                        | 0.2963                                      | 0.0010018                      | 83.96                        | 0.2963                                      |
| 40                      | 0.0010079                      | 167.51                       | 0.5723                                      | 0.0010078                      | 167.59                       | 0.5723                                      |
| 60                      | 15.336                         | 2610.8                       | 8.2313                                      | 0.0010171                      | 251.22                       | 0.8312                                      |
| 80                      | 16.268                         | 2648.9                       | 8.3422                                      | 0.0010290                      | 334.97                       | 1.0753                                      |
| 100                     | 17.196                         | 2686.9                       | 8.4471                                      | 1.6961                         | 2675.9                       | 7.3609                                      |
| 120                     | 18.124                         | 2725.1                       | 8.5466                                      | 1.7931                         | 2716.3                       | 7.4665                                      |
| 140                     | 19.050                         | 2763.3                       | 8.6414                                      | 1.8889                         | 2756.2                       | 7.5654                                      |
| 160                     | 19.976                         | 2801.7                       | 8.7322                                      | 1.9838                         | 2795.8                       | 7.6590                                      |
| 180                     | 20.901                         | 2840.2                       | 8.8192                                      | 2.0783                         | 2835.3                       | 7.7482                                      |
| 200                     | 21.826                         | 2879.0                       | 8.9029                                      | 2.1723                         | 2874.8                       | 7.8334                                      |
| 220                     | 22.750                         | 2918.0                       | 8.9835                                      | 2.2659                         | 2914.3                       | 7.9152                                      |
| 240                     | 23.674                         | 2957.1                       | 9.0614                                      | 2.3594                         | 2953.9                       | 7.9940                                      |
| 260                     | 24.598                         | 2996.5                       | 9.1367                                      | 2.4527                         | 2993.7                       | 8.0701                                      |
| 280                     | 25.522                         | 3036.2                       | 9.2097                                      | 2.5458                         | 3033.6                       | 8.1436                                      |
| 300                     | 26.446                         | 3076.0                       | 9.2805                                      | 2.6388                         | 3073.8                       | 8.2148                                      |
| 350                     | 28.755                         | 3176.6                       | 9.4488                                      | 2.8709                         | 3174.9                       | 8.3840                                      |
| 400                     | 31.063                         | 3278.7                       | 9.6064                                      | 3.1027                         | 3277.3                       | 8.5422                                      |
| 450                     | 33.372                         | 3382.3                       | 9.7548                                      | 3.3342                         | 3381.2                       | 8.6909                                      |
| 500                     | 35.680                         | 3487.4                       | 9.8953                                      | 3.5656                         | 3486.5                       | 8.8317                                      |
| 550                     | 37.988                         | 3594.3                       | 10.0293                                     | 3.7968                         | 3593.5                       | 8.9659                                      |
| 600                     | 40.296                         | 3703.4                       | 10.1579                                     | 4.0279                         | 3702.7                       | 9.0946                                      |

| $p$                     | 0.5MPa                          |                              |   | 1MPa                            |                              |   |
|-------------------------|---------------------------------|------------------------------|---|---------------------------------|------------------------------|---|
|                         | $(t_s = 151.867^\circ\text{C})$ |                              |   | $(t_s = 179.916^\circ\text{C})$ |                              |   |
|                         | $v'$                            | $h'$                         | $s'$  | $v'$                            | $h'$                         | $s'$  |
|                         | 0.0010925                       | 640.35                       | 1.8610                                      | 0.0011272                       | 762.84                       | 2.3188                                      |
|                         | $\text{m}^3/\text{kg}$          | $\text{kJ}/\text{kg}$        | $\text{kJ}/(\text{kg}\cdot\text{K})$        | $\text{m}^3/\text{kg}$          | $\text{kJ}/\text{kg}$        | $\text{kJ}/(\text{kg}\cdot\text{K})$        |
|                         | $v''$                           | $h''$                        | $s''$                                       | $v''$                           | $h''$                        | $s''$                                       |
|                         | 0.37490                         | 2748.6                       | 6.8214                                      | 0.191440                        | 2777.7                       | 6.5859                                      |
|                         | $\text{m}^3/\text{kg}$          | $\text{kJ}/\text{kg}$        | $\text{kJ}/(\text{kg}\cdot\text{K})$        | $\text{m}^3/\text{kg}$          | $\text{kJ}/\text{kg}$        | $\text{kJ}/(\text{kg}\cdot\text{K})$        |
| $t$<br>$^\circ\text{C}$ | $v$<br>$\text{m}^3/\text{kg}$   | $h$<br>$\text{kJ}/\text{kg}$ | $s$<br>$\text{kJ}/(\text{kg}\cdot\text{K})$ | $v$<br>$\text{m}^3/\text{kg}$   | $h$<br>$\text{kJ}/\text{kg}$ | $s$<br>$\text{kJ}/(\text{kg}\cdot\text{K})$ |
| 0                       | 0.0010000                       | 0.46                         | -0.0001                                     | 0.0009997                       | 0.97                         | -0.0001                                     |
| 10                      | 0.0010001                       | 42.49                        | 0.1510                                      | 0.0009999                       | 42.98                        | 0.1509                                      |
| 20                      | 0.0010016                       | 84.33                        | 0.2962                                      | 0.0010014                       | 84.80                        | 0.2961                                      |
| 40                      | 0.0010077                       | 167.94                       | 0.5721                                      | 0.0010074                       | 168.38                       | 0.5719                                      |
| 60                      | 0.0010169                       | 251.56                       | 0.8310                                      | 0.0010167                       | 251.98                       | 0.8307                                      |
| 80                      | 0.0010288                       | 335.29                       | 1.0750                                      | 0.0010286                       | 335.69                       | 1.0747                                      |
| 100                     | 0.0010432                       | 419.36                       | 1.3066                                      | 0.0010430                       | 419.74                       | 1.3062                                      |
| 120                     | 0.0010601                       | 503.97                       | 1.5275                                      | 0.0010599                       | 504.32                       | 1.5270                                      |
| 140                     | 0.0010796                       | 589.30                       | 1.7392                                      | 0.0010783                       | 589.62                       | 1.7386                                      |
| 160                     | 0.38358                         | 2767.2                       | 6.8647                                      | 0.0011017                       | 675.84                       | 1.9424                                      |
| 180                     | 0.40450                         | 2811.7                       | 6.9651                                      | 0.19443                         | 2777.9                       | 6.5864                                      |
| 200                     | 0.42487                         | 2854.9                       | 7.0585                                      | 0.20590                         | 2827.3                       | 6.6931                                      |
| 220                     | 0.44485                         | 2897.3                       | 7.1462                                      | 0.21686                         | 2874.2                       | 6.7903                                      |
| 240                     | 0.46455                         | 2939.2                       | 7.2295                                      | 0.22745                         | 2919.6                       | 6.8804                                      |
| 260                     | 0.48404                         | 2980.8                       | 7.3091                                      | 0.23779                         | 2963.8                       | 6.9650                                      |
| 280                     | 0.50336                         | 3022.2                       | 7.3853                                      | 0.24793                         | 3007.3                       | 7.0451                                      |
| 300                     | 0.52255                         | 3063.6                       | 7.4588                                      | 0.25793                         | 3050.4                       | 7.1216                                      |
| 350                     | 0.57012                         | 3167.0                       | 7.6319                                      | 0.28247                         | 3157.0                       | 7.2999                                      |
| 400                     | 0.61729                         | 3271.1                       | 7.7924                                      | 0.30658                         | 3263.1                       | 7.4638                                      |
| 420                     | 0.63608                         | 3312.9                       | 7.8537                                      | 0.31615                         | 3305.6                       | 7.5260                                      |
| 440                     | 0.65483                         | 3354.9                       | 7.9135                                      | 0.32568                         | 3348.2                       | 7.5866                                      |
| 450                     | 0.66420                         | 3376.0                       | 7.9428                                      | 0.33043                         | 3369.6                       | 7.6163                                      |



|                   |                           |                |                          |                           |                |                          |
|-------------------|---------------------------|----------------|--------------------------|---------------------------|----------------|--------------------------|
| 460               | 0.67356                   | 3397.2         | 7.9719                   | 0.33518                   | 3390.9         | 7.6456                   |
| 480               | 0.69226                   | 3439.6         | 8.0289                   | 0.34465                   | 3433.8         | 7.7033                   |
| 500               | 0.71094                   | 3482.2         | 8.0848                   | 0.35410                   | 3476.8         | 7.7597                   |
| 550               | 0.75755                   | 3589.9         | 8.2198                   | 0.37764                   | 3585.4         | 7.8958                   |
| 600               | 0.80408                   | 3699.6         | 8.3491                   | 0.40109                   | 3695.7         | 8.0259                   |
| $p$               | $3MPa$                    |                |                          | $5MPa$                    |                |                          |
|                   | $(t_s = 233.893^\circ C)$ |                |                          | $(t_s = 263.980^\circ C)$ |                |                          |
|                   | $v'$                      | $h'$           | $s'$                     | $v'$                      | $h'$           | $s'$                     |
|                   | 0.0012166                 | 1008.2         | 2.6454                   | 0.0012861                 | 1154.2         | 2.9200                   |
|                   | $m^3/kg$                  | $kJ/kg$        | $kJ/(kg \cdot K)$        | $m^3/kg$                  | $kJ/kg$        | $kJ/(kg \cdot K)$        |
|                   | $v''$                     | $h''$          | $s''$                    | $v''$                     | $h''$          | $s''$                    |
|                   | 0.066700                  | 2803.2         | 6.1854                   | 0.039400                  | 2793.6         | 5.9724                   |
|                   | $m^3/kg$                  | $kJ/kg$        | $kJ/(kg \cdot K)$        | $m^3/kg$                  | $kJ/kg$        | $kJ/(kg \cdot K)$        |
| $t$<br>$^\circ C$ | $v$<br>$m^3/kg$           | $h$<br>$kJ/kg$ | $s$<br>$kJ/(kg \cdot K)$ | $v$<br>$m^3/kg$           | $h$<br>$kJ/kg$ | $s$<br>$kJ/(kg \cdot K)$ |
| 0                 | 0.0009987                 | 3.01           | 0.0000                   | 0.0009977                 | 5.04           | 0.0002                   |
| 10                | 0.0009989                 | 44.92          | 0.1507                   | 0.0009979                 | 46.87          | 0.1506                   |
| 20                | 0.0010005                 | 86.68          | 0.2957                   | 0.0009996                 | 88.55          | 0.2952                   |
| 40                | 0.0010066                 | 170.15         | 0.5711                   | 0.0010057                 | 171.92         | 0.5704                   |
| 60                | 0.0010158                 | 253.66         | 0.8296                   | 0.0010149                 | 255.34         | 0.8286                   |
| 80                | 0.0010276                 | 377.28         | 1.0734                   | 0.0010267                 | 338.87         | 1.0721                   |
| 100               | 0.0010420                 | 421.24         | 1.3047                   | 0.0010410                 | 422.75         | 1.3031                   |
| 120               | 0.0010587                 | 505.73         | 1.5252                   | 0.0010576                 | 507.14         | 1.5234                   |
| 140               | 0.0010781                 | 590.92         | 1.7366                   | 0.0010768                 | 592.23         | 1.7345                   |
| 160               | 0.0011002                 | 677.01         | 1.9400                   | 0.0010988                 | 678.19         | 1.9377                   |
| 180               | 0.0011256                 | 764.23         | 2.1369                   | 0.0011240                 | 765.25         | 2.1342                   |
| 200               | 0.0011549                 | 852.93         | 2.3284                   | 0.0011529                 | 853.75         | 2.3253                   |
| 220               | 0.0011891                 | 943.65         | 2.5162                   | 0.0011867                 | 944.21         | 2.5125                   |
| 240               | 0.068184                  | 2823.4         | 6.2250                   | 0.0012266                 | 1037.3         | 2.6976                   |
| 260               | 0.072828                  | 2884.4         | 6.3417                   | 0.0012751                 | 1134.3         | 2.8829                   |
| 280               | 0.077101                  | 2940.1         | 6.4443                   | 0.042228                  | 2855.8         | 6.0864                   |
| 300               | 0.084191                  | 2992.4         | 6.5371                   | 0.045301                  | 2923.3         | 6.2064                   |

|                  |                                 |                       |                                      |                                 |                       |                                      |
|------------------|---------------------------------|-----------------------|--------------------------------------|---------------------------------|-----------------------|--------------------------------------|
| 350              | 0.090520                        | 3114.4                | 6.7414                               | 0.051932                        | 3067.4                | 6.4477                               |
| 400              | 0.099352                        | 3230.1                | 6.9199                               | 0.057804                        | 3194.9                | 6.6446                               |
| 420              | 0.102787                        | 3275.4                | 6.9864                               | 0.060033                        | 3243.6                | 6.7159                               |
| 440              | 0.106180                        | 3320.5                | 7.0505                               | 0.062216                        | 3291.5                | 6.7840                               |
| 450              | 0.107864                        | 3343.0                | 7.0817                               | 0.063291                        | 3315.2                | 6.8170                               |
| 460              | 0.109540                        | 3365.4                | 7.1125                               | 0.064358                        | 3338.8                | 6.8494                               |
| 480              | 0.112870                        | 3410.1                | 7.1728                               | 0.066469                        | 3385.6                | 6.9125                               |
| 500              | 0.116174                        | 3454.9                | 7.2314                               | 0.068552                        | 3432.2                | 6.9735                               |
| 550              | 0.124349                        | 3566.9                | 7.3718                               | 0.073664                        | 3548.0                | 7.1187                               |
| 600              | 0.132427                        | 3679.9                | 7.5051                               | 0.078675                        | 3663.9                | 7.2553                               |
| $p$              | $7\text{MPa}$                   |                       |                                      | $10\text{MPa}$                  |                       |                                      |
|                  | $(t_s = 285.869^\circ\text{C})$ |                       |                                      | $(t_s = 311.037^\circ\text{C})$ |                       |                                      |
|                  | $v'$                            | $h'$                  | $s'$                                 | $v'$                            | $h'$                  | $s'$                                 |
|                  | 0.0013515                       | 1266.9                | 3.1210                               | 0.0014522                       | 1407.2                | 3.3591                               |
|                  | $\text{m}^3/\text{kg}$          | $\text{kJ}/\text{kg}$ | $\text{kJ}/(\text{kg}\cdot\text{K})$ | $\text{m}^3/\text{kg}$          | $\text{kJ}/\text{kg}$ | $\text{kJ}/(\text{kg}\cdot\text{K})$ |
|                  | $v''$                           | $h''$                 | $s''$                                | $v''$                           | $h''$                 | $s''$                                |
|                  | 0.027400                        | 2771.7                | 5.8129                               | 0.018000                        | 2724.5                | 5.6139                               |
|                  | $\text{m}^3/\text{kg}$          | $\text{kJ}/\text{kg}$ | $\text{kJ}/(\text{kg}\cdot\text{K})$ | $\text{m}^3/\text{kg}$          | $\text{kJ}/\text{kg}$ | $\text{kJ}/(\text{kg}\cdot\text{K})$ |
| $t$              | $v$                             | $h$                   | $s$                                  | $v$                             | $h$                   | $s$                                  |
| $^\circ\text{C}$ | $\text{m}^3/\text{kg}$          | $\text{kJ}/\text{kg}$ | $\text{kJ}/(\text{kg}\cdot\text{K})$ | $\text{m}^3/\text{kg}$          | $\text{kJ}/\text{kg}$ | $\text{kJ}/(\text{kg}\cdot\text{K})$ |
| 0                | 0.0009967                       | 7.07                  | 0.0003                               | 0.0009952                       | 10.09                 | 0.0004                               |
| 10               | 0.0009970                       | 48.80                 | 0.1504                               | 0.0009956                       | 51.70                 | 0.1550                               |
| 20               | 0.0009986                       | 90.42                 | 0.2948                               | 0.0009973                       | 93.22                 | 0.2942                               |
| 40               | 0.0010048                       | 173.69                | 0.5696                               | 0.0010035                       | 176.34                | 0.5684                               |
| 60               | 0.0010140                       | 257.01                | 0.8275                               | 0.0010127                       | 259.53                | 0.8259                               |
| 80               | 0.0010258                       | 340.46                | 1.0708                               | 0.0010244                       | 342.85                | 1.0688                               |
| 100              | 0.0010399                       | 424.25                | 1.3016                               | 0.0010385                       | 426.51                | 1.2993                               |
| 120              | 0.0010565                       | 508.55                | 1.5216                               | 0.0010549                       | 510.68                | 1.5190                               |
| 140              | 0.0010756                       | 593.54                | 1.7325                               | 0.0010738                       | 595.50                | 1.7924                               |
| 160              | 0.0010974                       | 679.37                | 1.9353                               | 0.0010953                       | 681.16                | 1.9319                               |
| 180              | 0.0011223                       | 766.28                | 2.1315                               | 0.0011199                       | 767.84                | 2.1275                               |
| 200              | 0.0011510                       | 854.59                | 2.3222                               | 0.0011481                       | 855.88                | 2.3176                               |

|                         |                                 |                              |   |                                 |                              |   |
|-------------------------|---------------------------------|------------------------------|---|---------------------------------|------------------------------|---|
| 220                     | 0.0011842                       | 944.79                       | 2.5089                                      | 0.0011807                       | 945.71                       | 2.5036                                      |
| 240                     | 0.0012235                       | 1037.6                       | 2.6933                                      | 0.0012190                       | 1038.0                       | 2.6870                                      |
| 260                     | 0.0012710                       | 1134.0                       | 2.8776                                      | 0.0012650                       | 1133.6                       | 2.8698                                      |
| 280                     | 0.0013307                       | 1235.7                       | 3.0648                                      | 0.0013222                       | 1234.2                       | 3.0549                                      |
| 300                     | 0.029457                        | 2837.5                       | 5.9291                                      | 0.0013975                       | 1342.3                       | 3.2469                                      |
| 350                     | 0.035225                        | 3014.8                       | 6.2265                                      | 0.022415                        | 2922.1                       | 5.9423                                      |
| 400                     | 0.039917                        | 3157.3                       | 6.4465                                      | 0.026402                        | 3095.8                       | 6.2109                                      |
| 450                     | 0.044143                        | 3286.2                       | 6.6314                                      | 0.029735                        | 3240.5                       | 6.4184                                      |
| 500                     | 0.048110                        | 3408.9                       | 6.7954                                      | 0.032750                        | 3372.8                       | 6.5954                                      |
| 520                     | 0.049649                        | 3457.0                       | 6.8569                                      | 0.033900                        | 3423.8                       | 6.6605                                      |
| 540                     | 0.051166                        | 3504.8                       | 6.9164                                      | 0.035027                        | 3474.1                       | 6.7232                                      |
| 550                     | 0.051917                        | 3528.7                       | 6.9456                                      | 0.035582                        | 3499.1                       | 6.7537                                      |
| 560                     | 0.052664                        | 3552.4                       | 6.9743                                      | 0.036133                        | 3523.9                       | 6.7837                                      |
| 580                     | 0.054147                        | 3600.0                       | 7.0306                                      | 0.037222                        | 3573.3                       | 6.8423                                      |
| 600                     | 0.055617                        | 3647.5                       | 7.0857                                      | 0.038297                        | 3622.5                       | 6.8992                                      |
| $p$                     | 14MPa                           |                              |   | 20.0MPa                         |                              |   |
|                         | $(t_s = 336.707^\circ\text{C})$ |                              |   | $(t_s = 365.789^\circ\text{C})$ |                              |   |
|                         | $v'$                            | $h'$                         | $s'$  | $v'$                            | $h'$                         | $s'$  |
|                         | 0.0016097                       | 1570.4                       | 3.6220                                      | 0.002037                        | 1827.2                       | 4.0153                                      |
|                         | $\text{m}^3/\text{kg}$          | $\text{kJ}/\text{kg}$        | $\text{kJ}/(\text{kg}\cdot\text{K})$        | $\text{m}^3/\text{kg}$          | $\text{kJ}/\text{kg}$        | $\text{kJ}/(\text{kg}\cdot\text{K})$        |
|                         | $v''$                           | $h''$                        | $s''$                                       | $v''$                           | $h''$                        | $s''$                                       |
|                         | 0.011500                        | 2637.1                       | 5.3711                                      | 0.0058702                       | 2413.1                       | 4.9322                                      |
|                         | $\text{m}^3/\text{kg}$          | $\text{kJ}/\text{kg}$        | $\text{kJ}/(\text{kg}\cdot\text{K})$        | $\text{m}^3/\text{kg}$          | $\text{kJ}/\text{kg}$        | $\text{kJ}/(\text{kg}\cdot\text{K})$        |
| $t$<br>$^\circ\text{C}$ | $v$<br>$\text{m}^3/\text{kg}$   | $h$<br>$\text{kJ}/\text{kg}$ | $s$<br>$\text{kJ}/(\text{kg}\cdot\text{K})$ | $v$<br>$\text{m}^3/\text{kg}$   | $h$<br>$\text{kJ}/\text{kg}$ | $s$<br>$\text{kJ}/(\text{kg}\cdot\text{K})$ |
| 0                       | 0.0009933                       | 14.10                        | 0.0005                                      | 0.0009904                       | 20.08                        | 0.0006                                      |
| 10                      | 0.0009938                       | 55.55                        | 0.1496                                      | 0.0009911                       | 61.29                        | 0.1488                                      |
| 20                      | 0.0009955                       | 96.95                        | 0.2932                                      | 0.0009929                       | 102.50                       | 0.2919                                      |
| 40                      | 0.0010018                       | 179.86                       | 0.5669                                      | 0.0009992                       | 185.13                       | 0.5645                                      |
| 60                      | 0.0010109                       | 262.88                       | 0.8239                                      | 0.0010084                       | 267.90                       | 0.8207                                      |
| 80                      | 0.0010226                       | 346.04                       | 1.0663                                      | 0.0010199                       | 350.82                       | 1.0624                                      |
| 100                     | 0.0010365                       | 429.53                       | 1.2962                                      | 0.0010336                       | 434.06                       | 1.2917                                      |

|           |                 |                |                          |                 |                |                          |
|-----------|-----------------|----------------|--------------------------|-----------------|----------------|--------------------------|
| 120       | 0.0010527       | 513.52         | 1.5155                   | 0.0010496       | 517.79         | 1.5103                   |
| 140       | 0.0010714       | 598.14         | 1.7254                   | 0.0010679       | 602.12         | 1.7195                   |
| 160       | 0.0010926       | 683.56         | 1.9273                   | 0.0010886       | 687.20         | 1.9206                   |
| 180       | 0.0011167       | 769.96         | 2.1223                   | 0.0011121       | 773.19         | 2.1147                   |
| 200       | 0.0011443       | 857.63         | 2.3116                   | 0.0011389       | 860.36         | 2.3029                   |
| 220       | 0.0011761       | 947.00         | 2.4966                   | 0.0011695       | 949.07         | 2.4865                   |
| 240       | 0.0012132       | 1038.6         | 2.6788                   | 0.0012051       | 1039.8         | 2.6670                   |
| 260       | 0.0012574       | 1133.4         | 2.8599                   | 0.0012469       | 1133.4         | 2.8457                   |
| 280       | 0.0013117       | 1232.5         | 3.0424                   | 0.0012974       | 1230.7         | 3.0249                   |
| 300       | 0.0013814       | 1338.2         | 3.2300                   | 0.0013605       | 1333.4         | 3.2072                   |
| 350       | 0.013218        | 2751.2         | 5.5564                   | 0.0016645       | 1645.3         | 3.7275                   |
| 400       | 0.017218        | 3001.1         | 5.9436                   | 0.0099458       | 2816.8         | 5.5520                   |
| 450       | 0.020074        | 3174.2         | 6.1919                   | 0,0127013       | 3060.7         | 5.9025                   |
| 500       | 0.022512        | 3322.3         | 6.3900                   | 0.0147681       | 3239.3         | 6.1415                   |
| 520       | 0.023418        | 3377.9         | 6.4610                   | 0.0155046       | 3303.0         | 6.2229                   |
| 540       | 0.024295        | 3432.1         | 6-5285                   | 0.0162067       | 3364.0         | 6.2989                   |
| 550       | 0.024724        | 3458.7         | 6.5611                   | 0.0165471       | 3393.7         | 6.3352                   |
| 560       | 0.025147        | 3485.2         | 6.5931                   | 0.0168811       | 3422.9         | 6.3705                   |
| 580       | 0.025978        | 3537.5         | 6.6551                   | 0.0175328       | 3480.3         | 6.4385                   |
| 600       | 0.026792        | 3589.1         | 6.7149                   | 0.0181655       | 3536.3         | 6.5035                   |
| $p$       | $25MPa$         |                |                          | $30MPa$         |                |                          |
| $t$<br>°C | $v$<br>$m^3/kg$ | $h$<br>$kJ/kg$ | $s$<br>$kJ/(kg \cdot K)$ | $v$<br>$m^3/kg$ | $h$<br>$kJ/kg$ | $s$<br>$kJ/(kg \cdot K)$ |
| 0         | 0.0009880       | 25.01          | 0.0006                   | 0.0009857       | 29.92          | 0.0005                   |
| 10        | 0.0009888       | 66.04          | 0.1481                   | 0.0009866       | 70.77          | 0.1474                   |
| 20        | 0.0009908       | 107.11         | 0.2907                   | 0.0009887       | 111.71         | 0.2895                   |
| 40        | 0.0009972       | 189.51         | 0.5626                   | 0.0009951       | 193.87         | 0.5606                   |
| 60        | 0.0010063       | 272.08         | 0.8182                   | 0.0010042       | 276.25         | 0.8156                   |
| 80        | 0.0010177       | 354.80         | 1.0593                   | 0.0010155       | 358.78         | 1.0562                   |
| 100       | 0.0010313       | 437.85         | 1.2880                   | 0.0010290       | 441.64         | 1.2844                   |
| 120       | 0.0010470       | 521.36         | 1.5061                   | 0.0010445       | 524.95         | 1.5019                   |
| 140       | 0.0010650       | 605.46         | 1.7147                   | 0.0010622       | 608.82         | 1.7100                   |
| 160       | 0.0010854       | 690.27         | 1.9152                   | 0.0010822       | 693.36         | 1.9098                   |
| 180       | 0.0011084       | 775.94         | 2.1085                   | 0.0011048       | 778.72         | 2.1024                   |
| 200       | 0.0011345       | 862.71         | 2.2959                   | 0.0011303       | 865.12         | 2.2890                   |
| 220       | 0.0011643       | 950.91         | 2.4785                   | 0.0011593       | 952.85         | 2.4706                   |
| 240       | 0.0011986       | 1041.0         | 2.6575                   | 0.0011925       | 1042.3         | 2.6485                   |

|     |           |        |        |           |        |        |
|-----|-----------|--------|--------|-----------|--------|--------|
| 260 | 0.0012387 | 1133.6 | 2.8346 | 0.0012311 | 1134.1 | 2.8239 |
| 280 | 0.0012866 | 1229.6 | 3.0113 | 0.0012766 | 1229.0 | 2.9985 |
| 300 | 0.0013453 | 1330.3 | 3.1901 | 0.0013317 | 1327.9 | 3.1742 |
| 350 | 0.0015981 | 1623.1 | 3.6788 | 0.0015522 | 1608.0 | 3.6420 |
| 400 | 0.0060014 | 2578.0 | 5.1386 | 0.0027929 | 2150.6 | 4.4721 |
| 450 | 0.0091666 | 2950.5 | 5.6754 | 0.0067363 | 2822.1 | 5.4433 |
| 500 | 0.0111229 | 3164.1 | 5.9614 | 0.0086761 | 3083.3 | 5.7934 |
| 520 | 0.0117897 | 3236.1 | 6.0534 | 0.0093033 | 3165.4 | 5.8982 |
| 540 | 0.0124156 | 3303.8 | 6.1377 | 0.0098825 | 3240.8 | 5.9921 |
| 550 | 0.0127161 | 3336.4 | 6.1775 | 0.0101580 | 3276.6 | 6.0359 |
| 560 | 0.0130095 | 3368.2 | 6.2160 | 0.0104254 | 3311.4 | 6.0780 |
| 580 | 0.0135778 | 3430.2 | 6.2895 | 0.0109397 | 3378.5 | 6.1576 |
| 600 | 0.0141249 | 3490.2 | 6.3591 | 0.0114310 | 3442.9 | 6.232L |

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