**Model Updates with Physical Property Correlations**

1. **Physical Property Correlations**

Correlations for several physical properties of pure components (CO2, H2O and N2) are generated from Aspen property data. These correlations include heat capacity, molar enthalpy and density. The related Aspen property data are shown in Section 3. Other physical properties, including diffusivity, thermal conductivity and viscosity, are still directly called from Aspen property database due to their complexity.

* 1. *Heat Capacity*

The heat capacity of CO2, H2O and N2 only changes with a small amount (less than 0.5%) from 1.0 bar to 1.3 bar, which is the pressure range for all streams and equipment in the BFB system. Hence, the correlations of heat capacity only contain the relationship with temperature. All correlations are regressed from Aspen property data at 1.1 bar. The correlations for heat capacity are shown below:

where is the specific heat capacity at constant pressure (kJ/mol/K), is the specific heat capacity at constant volume (kJ/mol/K), and is the temperature (°C).

The heat capacity of the process streams or material flows in the unit can be calculated as:

where is the molar fraction of each component in the stream. The deviations of these heat capacity calculations to the Aspen property calls are within 0.05%.

* 1. *Molar Enthalpy*

The dependency of the molar enthalpy (for both vapor and liquid) on pressure is negligible, and the change of vapor and liquid molar enthalpy between 1.0 bar and 1.3 bar is less than 0.1%. The correlations of molar enthalpy only contain the relationship with temperature. All correlations are regressed from Aspen property data at 1.1 bar. Correlations for vapor molar enthalpy are available for CO2, H2O and N2, and correlations for liquid molar enthalpy are only available for H2O. The correlations for heat capacity are shown below:

where is the molar vapor enthalpy (GJ/kmol), is the molar liquid enthalpy (GJ/kmol), and is the temperature (°C).

The molar vapor enthalpy of the process streams or material flows in the unit is calculated as:

where is the molar fraction of each component in the stream. The deviations of these molar vapor enthalpy calculations to the Aspen property calls are within 0.005%.

The molar liquid enthalpy of the heat exchanger (HX) fluid is calculated as:

The deviation of the molar liquid enthalpy calculation to the Aspen property call is within 0.0005%.

* 1. *Density*

The molar vapor density of all streams is calculated from the ideal gas law (as shown below), instead of the Aspen property data.

where is the total molar vapor density of the stream (kmol/m3), is the pressure (bar), is the temperature (°C), and is the universal gas constant, which is equal to 8.3145 J/mol/K. The deviation of the vapor density calculation to the Aspen property call is within 0.5%.

The mass liquid density of H2O is only dependent on the temperature (negligible for the pressure). The correlation of the mass liquid density of H2O is regressed from the Aspen property data at 1.12 bar.

where is the mass liquid density (kg/m3) and is the temperature (°C). The mass density of the HX fluid is equal to that of H2O, and its deviation to the Aspen property call is within 0.0005%.

* 1. *Steam Properties*

Correlations for several physical properties of the intermediate-pressure steam (at 6.9 bar) are regressed from the steam table and Aspen property database.

The dew point temperature of the steam (°C) is shown below:

or

The vaporization heat of the steam (GJ/kmol) is:

where is the pressure (bar).

The molar vapor enthalpy of the steam (at 6.9 bar) (GJ/kmol) is shown below:

where is the temperature (°C).

1. **Model Updates**

A number of codes in the BFB model have been modified to replace the physical property correlations with Aspen physical property calls. The old model is the ACM model for the BFB capture system for OUU, which is entitled as “BFB\_OUU\_COE.acmf”.

The following is an example, which shows the code changes between the old and new BFB model:

Old model: Line 599

CALL (cpg\_mol\_in) = pCp\_Mol\_Vap (GasIn.T,P(0),GasIn.z(gaslist));

New model: Line 601

cpg\_mol\_in = GasIn.z("CO2")\*(-6.5047E-05\*GasIn.T^2 + 0.051978\*GasIn.T + 36.233)

+ GasIn.z("H2O")\*(2.6650E-05\*GasIn.T^2 + 3.0725E-04\*GasIn.T + 34.034)

+ GasIn.z("N2") \*(1.0640E-05\*GasIn.T^2 - 6.9842E-04\*GasIn.T + 29.205);

All update locations in the entire system model are listed below:

**Model BFB:**

Old model: Line 599 → New model: Line 601

Old model: Line 603 → New model: Line 608

Old model: Line 605 → New model: Line 613

Old model: Line 616 - 619 → New model: Line 641 - 652

Old model: Line 632 - 640 → New model: Deleted

Old model: Line 644 - 645 → New model: Line 679 - 684

Old model: Line 786 → New model: Line 826

Old model: Line 812 → New model: Line 857 - 862 & 925 - 930

Old model: Line 849 → New model: Line 899 - 908

Old model: Line 853 - 854 → New model: Line 914 - 915

**Model GHX:**

Old model: Line 70 - 71 → New model: Line 72 - 73

Old model: Line 72 → New model: Line 75 -77

Old model: Line 75 → New model: Line 81 - 85

Old model: Line 76 → New model: Line 88 - 92

Old model: Line 80 → New model: Line 96

**Model Injector:**

Old model: Line 15 → New model: Line 16 - 18

Old model: Line 16 → New model: Line 20 - 22

Old model: Line 17 → New model: Line 24

Old model: Line 18 → New model: Line 26

**Model PolyComp:**

Old model: Line 48 → New model: Line 49 - 51

Old model: Line 49 → New model: Line 53 - 55

Old model: Line 50 → New model: Line 57

Old model: Line 58 → New model: Line 67

**Model SHX:**

Old model: Line 57 → New model: Line 58 - 59

Old model: Line 58 → New model: Line 61 - 62

Old model: Line 68 → New model: Line 73

**Model SHX2:**

Old model: Line 68 → New model: Line 69 - 70

Old model: Line 69 → New model: Line 72 - 73

Old model: Line 72 → New model: Line 77 - 81

Old model: Line 73 → New model: Line 83 - 87

Old model: Line 79 → New model: Line 94

1. **Aspen Property Data**

*3.1. Heat Capacity*

**CP** (kJ/kmol/K)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **CO2** | | | | **H2O** | | | | **N2** | | | |
| P(bar)→  T(°C) ↓ | 1.0 | **1.1** | 1.2 | 1.3 | 1.0 | **1.1** | 1.2 | 1.3 | 1.0 | **1.1** | 1.2 | 1.3 |
| 20 | 37.211 | 37.234 | 37.257 | 37.280 | 34.029 | 34.079 | 34.129 | 34.180 | 29.185 | 29.191 | 29.197 | 29.203 |
| 23.6 | 37.392 | 37.415 | 37.437 | 37.460 | 34.031 | 34.079 | 34.128 | 34.177 | 29.185 | 29.191 | 29.197 | 29.203 |
| 27.2 | 37.572 | 37.594 | 37.616 | 37.638 | 34.034 | 34.081 | 34.128 | 34.176 | 29.185 | 29.191 | 29.197 | 29.203 |
| 30.8 | 37.750 | 37.771 | 37.793 | 37.814 | 34.038 | 34.083 | 34.129 | 34.176 | 29.186 | 29.192 | 29.197 | 29.203 |
| 34.4 | 37.909 | 37.928 | 37.947 | 37.966 | 34.043 | 34.087 | 34.132 | 34.177 | 29.187 | 29.192 | 29.198 | 29.203 |
| 38 | 38.084 | 38.103 | 38.121 | 38.140 | 34.049 | 34.092 | 34.136 | 34.179 | 29.188 | 29.193 | 29.198 | 29.204 |
| 41.6 | 38.257 | 38.275 | 38.293 | 38.312 | 34.056 | 34.098 | 34.140 | 34.183 | 29.189 | 29.194 | 29.199 | 29.205 |
| 45.2 | 38.428 | 38.446 | 38.464 | 38.482 | 34.065 | 34.105 | 34.146 | 34.188 | 29.190 | 29.195 | 29.200 | 29.205 |
| 48.8 | 38.597 | 38.615 | 38.632 | 38.649 | 34.074 | 34.114 | 34.154 | 34.194 | 29.192 | 29.197 | 29.202 | 29.207 |
| 52.4 | 38.764 | 38.781 | 38.798 | 38.815 | 34.084 | 34.123 | 34.162 | 34.201 | 29.193 | 29.198 | 29.203 | 29.208 |
| 56 | 38.929 | 38.946 | 38.962 | 38.979 | 34.095 | 34.133 | 34.171 | 34.209 | 29.195 | 29.200 | 29.205 | 29.210 |
| 59.6 | 39.092 | 39.108 | 39.124 | 39.141 | 34.108 | 34.144 | 34.181 | 34.218 | 29.197 | 29.202 | 29.207 | 29.211 |
| 63.2 | 39.253 | 39.268 | 39.284 | 39.300 | 34.121 | 34.156 | 34.192 | 34.229 | 29.200 | 29.204 | 29.209 | 29.213 |
| 66.8 | 39.411 | 39.427 | 39.442 | 39.458 | 34.135 | 34.170 | 34.205 | 34.240 | 29.202 | 29.207 | 29.211 | 29.216 |
| 70.4 | 39.568 | 39.583 | 39.598 | 39.613 | 34.150 | 34.184 | 34.218 | 34.252 | 29.205 | 29.210 | 29.214 | 29.218 |
| 74 | 39.722 | 39.737 | 39.752 | 39.767 | 34.165 | 34.198 | 34.232 | 34.265 | 29.208 | 29.213 | 29.217 | 29.221 |
| 77.6 | 39.874 | 39.889 | 39.903 | 39.918 | 34.182 | 34.214 | 34.247 | 34.280 | 29.212 | 29.216 | 29.220 | 29.224 |
| 81.2 | 40.024 | 40.039 | 40.053 | 40.067 | 34.199 | 34.231 | 34.263 | 34.295 | 29.215 | 29.219 | 29.223 | 29.227 |
| 84.8 | 40.172 | 40.186 | 40.200 | 40.215 | 34.217 | 34.248 | 34.279 | 34.311 | 29.219 | 29.223 | 29.227 | 29.231 |
| 88.4 | 40.318 | 40.332 | 40.346 | 40.360 | 34.236 | 34.266 | 34.297 | 34.327 | 29.223 | 29.227 | 29.231 | 29.235 |
| 92 | 40.463 | 40.476 | 40.490 | 40.503 | 34.256 | 34.285 | 34.315 | 34.345 | 29.227 | 29.231 | 29.235 | 29.239 |
| 95.6 | 40.605 | 40.618 | 40.631 | 40.645 | 34.276 | 34.305 | 34.334 | 34.363 | 29.232 | 29.236 | 29.239 | 29.243 |
| 99.2 | 40.745 | 40.758 | 40.771 | 40.784 | 34.298 | 34.326 | 34.354 | 34.383 | 29.237 | 29.241 | 29.244 | 29.248 |
| 102.8 | 40.884 | 40.896 | 40.909 | 40.922 | 34.319 | 34.347 | 34.375 | 34.403 | 29.242 | 29.246 | 29.249 | 29.253 |
| 106.4 | 41.020 | 41.033 | 41.045 | 41.058 | 34.342 | 34.369 | 34.396 | 34.423 | 29.248 | 29.251 | 29.254 | 29.258 |
| 110 | 41.155 | 41.167 | 41.179 | 41.192 | 34.365 | 34.391 | 34.418 | 34.445 | 29.253 | 29.257 | 29.260 | 29.263 |
| 113.6 | 41.288 | 41.300 | 41.312 | 41.324 | 34.389 | 34.415 | 34.441 | 34.467 | 29.259 | 29.263 | 29.266 | 29.269 |
| 117.2 | 41.419 | 41.431 | 41.443 | 41.455 | 34.413 | 34.439 | 34.464 | 34.489 | 29.266 | 29.269 | 29.272 | 29.275 |
| 120.8 | 41.549 | 41.560 | 41.572 | 41.583 | 34.438 | 34.463 | 34.488 | 34.513 | 29.272 | 29.275 | 29.278 | 29.282 |
| 124.4 | 41.676 | 41.688 | 41.699 | 41.711 | 34.464 | 34.488 | 34.512 | 34.537 | 29.279 | 29.282 | 29.285 | 29.288 |
| 128 | 41.803 | 41.814 | 41.825 | 41.836 | 34.490 | 34.514 | 34.538 | 34.561 | 29.286 | 29.289 | 29.292 | 29.295 |
| 131.6 | 41.927 | 41.938 | 41.949 | 41.960 | 34.517 | 34.540 | 34.563 | 34.587 | 29.294 | 29.297 | 29.300 | 29.303 |
| 135.2 | 42.051 | 42.061 | 42.072 | 42.083 | 34.544 | 34.567 | 34.590 | 34.612 | 29.301 | 29.304 | 29.307 | 29.310 |
| 138.8 | 42.172 | 42.183 | 42.194 | 42.204 | 34.572 | 34.594 | 34.616 | 34.639 | 29.309 | 29.312 | 29.315 | 29.318 |
| 142.4 | 42.293 | 42.303 | 42.313 | 42.324 | 34.600 | 34.622 | 34.644 | 34.666 | 29.318 | 29.321 | 29.323 | 29.326 |
| 146 | 42.411 | 42.422 | 42.432 | 42.442 | 34.628 | 34.650 | 34.671 | 34.693 | 29.326 | 29.329 | 29.332 | 29.335 |
| 149.6 | 42.529 | 42.539 | 42.549 | 42.559 | 34.658 | 34.679 | 34.700 | 34.721 | 29.335 | 29.338 | 29.341 | 29.343 |
| 153.2 | 42.645 | 42.655 | 42.665 | 42.675 | 34.687 | 34.708 | 34.729 | 34.749 | 29.345 | 29.347 | 29.350 | 29.352 |
| 156.8 | 42.760 | 42.769 | 42.779 | 42.789 | 34.717 | 34.738 | 34.758 | 34.778 | 29.354 | 29.357 | 29.359 | 29.362 |
| 160.4 | 42.873 | 42.883 | 42.892 | 42.902 | 34.748 | 34.768 | 34.788 | 34.808 | 29.364 | 29.367 | 29.369 | 29.372 |
| 164 | 42.985 | 42.995 | 43.004 | 43.014 | 34.779 | 34.798 | 34.818 | 34.837 | 29.374 | 29.377 | 29.379 | 29.382 |
| 167.6 | 43.096 | 43.106 | 43.115 | 43.124 | 34.810 | 34.829 | 34.848 | 34.867 | 29.385 | 29.387 | 29.389 | 29.392 |
| 171.2 | 43.206 | 43.216 | 43.225 | 43.234 | 34.841 | 34.860 | 34.879 | 34.898 | 29.395 | 29.398 | 29.400 | 29.402 |
| 174.8 | 43.315 | 43.324 | 43.333 | 43.342 | 34.873 | 34.892 | 34.910 | 34.929 | 29.406 | 29.409 | 29.411 | 29.413 |
| 178.4 | 43.423 | 43.432 | 43.441 | 43.449 | 34.906 | 34.924 | 34.942 | 34.960 | 29.418 | 29.420 | 29.422 | 29.425 |
| 182 | 43.530 | 43.538 | 43.547 | 43.556 | 34.938 | 34.956 | 34.974 | 34.992 | 29.429 | 29.432 | 29.434 | 29.436 |
| 185.6 | 43.635 | 43.644 | 43.652 | 43.661 | 34.971 | 34.989 | 35.006 | 35.024 | 29.441 | 29.444 | 29.446 | 29.448 |
| 189.2 | 43.740 | 43.748 | 43.757 | 43.765 | 35.005 | 35.022 | 35.039 | 35.056 | 29.454 | 29.456 | 29.458 | 29.460 |
| 192.8 | 43.843 | 43.852 | 43.860 | 43.868 | 35.038 | 35.055 | 35.072 | 35.089 | 29.466 | 29.468 | 29.470 | 29.473 |
| 196.4 | 43.946 | 43.954 | 43.963 | 43.971 | 35.072 | 35.089 | 35.105 | 35.122 | 29.479 | 29.481 | 29.483 | 29.485 |
| 200 | 44.048 | 44.056 | 44.064 | 44.072 | 35.106 | 35.123 | 35.139 | 35.155 | 29.492 | 29.494 | 29.496 | 29.498 |

**CV** (kJ/kmol/K)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **CO2** | | | | **H2O** | | | | **N2** | | | |
| P(bar)→  T(°C) ↓ | 1.0 | **1.1** | 1.2 | 1.3 | 1.0 | **1.1** | 1.2 | 1.3 | 1.0 | **1.1** | 1.2 | 1.3 |
| 20 | 28.693 | 28.697 | 28.700 | 28.703 | 25.282 | 25.286 | 25.291 | 25.296 | 20.814 | 20.815 | 20.817 | 20.818 |
| 23.6 | 28.880 | 28.884 | 28.887 | 28.890 | 25.295 | 25.300 | 25.305 | 25.309 | 20.816 | 20.817 | 20.818 | 20.819 |
| 27.2 | 29.065 | 29.069 | 29.072 | 29.075 | 25.310 | 25.314 | 25.319 | 25.323 | 20.817 | 20.819 | 20.820 | 20.821 |
| 30.8 | 29.249 | 29.252 | 29.255 | 29.258 | 25.325 | 25.329 | 25.334 | 25.338 | 20.819 | 20.821 | 20.822 | 20.823 |
| 34.4 | 29.412 | 29.413 | 29.415 | 29.416 | 25.341 | 25.345 | 25.349 | 25.354 | 20.821 | 20.823 | 20.824 | 20.825 |
| 38 | 29.592 | 29.593 | 29.594 | 29.596 | 25.357 | 25.361 | 25.366 | 25.370 | 20.823 | 20.825 | 20.826 | 20.827 |
| 41.6 | 29.769 | 29.770 | 29.772 | 29.773 | 25.374 | 25.378 | 25.382 | 25.387 | 20.826 | 20.827 | 20.828 | 20.830 |
| 45.2 | 29.944 | 29.946 | 29.947 | 29.948 | 25.392 | 25.396 | 25.400 | 25.404 | 20.828 | 20.829 | 20.831 | 20.832 |
| 48.8 | 30.117 | 30.119 | 30.120 | 30.121 | 25.410 | 25.414 | 25.418 | 25.422 | 20.831 | 20.832 | 20.833 | 20.835 |
| 52.4 | 30.288 | 30.290 | 30.291 | 30.292 | 25.429 | 25.433 | 25.437 | 25.441 | 20.834 | 20.835 | 20.836 | 20.837 |
| 56 | 30.457 | 30.458 | 30.460 | 30.461 | 25.449 | 25.453 | 25.457 | 25.461 | 20.837 | 20.838 | 20.839 | 20.840 |
| 59.6 | 30.623 | 30.624 | 30.626 | 30.627 | 25.469 | 25.473 | 25.477 | 25.481 | 20.840 | 20.841 | 20.842 | 20.844 |
| 63.2 | 30.787 | 30.789 | 30.790 | 30.791 | 25.490 | 25.494 | 25.498 | 25.502 | 20.843 | 20.845 | 20.846 | 20.847 |
| 66.8 | 30.949 | 30.950 | 30.952 | 30.953 | 25.512 | 25.515 | 25.519 | 25.523 | 20.847 | 20.848 | 20.849 | 20.850 |
| 70.4 | 31.109 | 31.110 | 31.112 | 31.113 | 25.534 | 25.538 | 25.541 | 25.545 | 20.851 | 20.852 | 20.853 | 20.854 |
| 74 | 31.266 | 31.268 | 31.269 | 31.271 | 25.557 | 25.560 | 25.564 | 25.568 | 20.855 | 20.856 | 20.857 | 20.858 |
| 77.6 | 31.421 | 31.423 | 31.424 | 31.426 | 25.580 | 25.584 | 25.587 | 25.591 | 20.859 | 20.860 | 20.861 | 20.862 |
| 81.2 | 31.575 | 31.576 | 31.578 | 31.579 | 25.604 | 25.608 | 25.611 | 25.615 | 20.863 | 20.864 | 20.866 | 20.867 |
| 84.8 | 31.726 | 31.727 | 31.729 | 31.730 | 25.629 | 25.632 | 25.636 | 25.639 | 20.868 | 20.869 | 20.870 | 20.871 |
| 88.4 | 31.875 | 31.876 | 31.878 | 31.879 | 25.654 | 25.657 | 25.661 | 25.664 | 20.873 | 20.874 | 20.875 | 20.876 |
| 92 | 32.021 | 32.023 | 32.024 | 32.026 | 25.679 | 25.683 | 25.686 | 25.689 | 20.878 | 20.879 | 20.880 | 20.881 |
| 95.6 | 32.166 | 32.168 | 32.169 | 32.171 | 25.706 | 25.709 | 25.712 | 25.715 | 20.883 | 20.884 | 20.885 | 20.887 |
| 99.2 | 32.309 | 32.311 | 32.312 | 32.314 | 25.732 | 25.736 | 25.739 | 25.742 | 20.889 | 20.890 | 20.891 | 20.892 |
| 102.8 | 32.450 | 32.452 | 32.453 | 32.455 | 25.759 | 25.763 | 25.766 | 25.769 | 20.895 | 20.896 | 20.897 | 20.898 |
| 106.4 | 32.589 | 32.591 | 32.592 | 32.594 | 25.787 | 25.790 | 25.794 | 25.797 | 20.901 | 20.902 | 20.903 | 20.904 |
| 110 | 32.726 | 32.728 | 32.729 | 32.731 | 25.815 | 25.819 | 25.822 | 25.825 | 20.907 | 20.908 | 20.909 | 20.910 |
| 113.6 | 32.861 | 32.863 | 32.864 | 32.866 | 25.844 | 25.847 | 25.850 | 25.853 | 20.914 | 20.915 | 20.916 | 20.917 |
| 117.2 | 32.995 | 32.996 | 32.998 | 33.000 | 25.873 | 25.876 | 25.879 | 25.882 | 20.921 | 20.922 | 20.923 | 20.924 |
| 120.8 | 33.127 | 33.128 | 33.130 | 33.131 | 25.903 | 25.906 | 25.909 | 25.912 | 20.928 | 20.929 | 20.930 | 20.931 |
| 124.4 | 33.256 | 33.258 | 33.260 | 33.261 | 25.933 | 25.936 | 25.939 | 25.942 | 20.935 | 20.936 | 20.937 | 20.938 |
| 128 | 33.385 | 33.386 | 33.388 | 33.390 | 25.964 | 25.966 | 25.969 | 25.972 | 20.943 | 20.944 | 20.945 | 20.946 |
| 131.6 | 33.512 | 33.513 | 33.515 | 33.516 | 25.994 | 25.997 | 26.000 | 26.003 | 20.951 | 20.952 | 20.953 | 20.954 |
| 135.2 | 33.637 | 33.638 | 33.640 | 33.641 | 26.026 | 26.029 | 26.031 | 26.034 | 20.959 | 20.960 | 20.961 | 20.962 |
| 138.8 | 33.760 | 33.762 | 33.763 | 33.765 | 26.058 | 26.060 | 26.063 | 26.066 | 20.968 | 20.969 | 20.970 | 20.971 |
| 142.4 | 33.882 | 33.884 | 33.885 | 33.887 | 26.090 | 26.092 | 26.095 | 26.098 | 20.977 | 20.978 | 20.979 | 20.980 |
| 146 | 34.003 | 34.004 | 34.006 | 34.008 | 26.122 | 26.125 | 26.128 | 26.130 | 20.986 | 20.987 | 20.988 | 20.989 |
| 149.6 | 34.122 | 34.124 | 34.125 | 34.127 | 26.155 | 26.158 | 26.160 | 26.163 | 20.995 | 20.996 | 20.997 | 20.998 |
| 153.2 | 34.240 | 34.241 | 34.243 | 34.245 | 26.188 | 26.191 | 26.193 | 26.196 | 21.005 | 21.006 | 21.007 | 21.008 |
| 156.8 | 34.356 | 34.358 | 34.360 | 34.361 | 26.222 | 26.224 | 26.227 | 26.229 | 21.015 | 21.016 | 21.017 | 21.018 |
| 160.4 | 34.471 | 34.473 | 34.475 | 34.476 | 26.255 | 26.258 | 26.261 | 26.263 | 21.025 | 21.026 | 21.027 | 21.028 |
| 164 | 34.585 | 34.587 | 34.589 | 34.590 | 26.289 | 26.292 | 26.295 | 26.297 | 21.036 | 21.037 | 21.038 | 21.039 |
| 167.6 | 34.698 | 34.699 | 34.701 | 34.703 | 26.324 | 26.326 | 26.329 | 26.331 | 21.047 | 21.048 | 21.048 | 21.049 |
| 171.2 | 34.809 | 34.811 | 34.813 | 34.814 | 26.359 | 26.361 | 26.364 | 26.366 | 21.058 | 21.059 | 21.060 | 21.060 |
| 174.8 | 34.920 | 34.921 | 34.923 | 34.924 | 26.394 | 26.396 | 26.399 | 26.401 | 21.069 | 21.070 | 21.071 | 21.072 |
| 178.4 | 35.029 | 35.030 | 35.032 | 35.034 | 26.429 | 26.431 | 26.434 | 26.436 | 21.081 | 21.082 | 21.083 | 21.084 |
| 182 | 35.137 | 35.138 | 35.140 | 35.142 | 26.464 | 26.467 | 26.469 | 26.472 | 21.093 | 21.094 | 21.095 | 21.096 |
| 185.6 | 35.244 | 35.245 | 35.247 | 35.249 | 26.500 | 26.503 | 26.505 | 26.507 | 21.105 | 21.106 | 21.107 | 21.108 |
| 189.2 | 35.350 | 35.351 | 35.353 | 35.355 | 26.536 | 26.539 | 26.541 | 26.543 | 21.118 | 21.119 | 21.120 | 21.120 |
| 192.8 | 35.455 | 35.456 | 35.458 | 35.460 | 26.572 | 26.575 | 26.577 | 26.579 | 21.131 | 21.132 | 21.132 | 21.133 |
| 196.4 | 35.559 | 35.560 | 35.562 | 35.564 | 26.609 | 26.611 | 26.613 | 26.616 | 21.144 | 21.145 | 21.146 | 21.146 |
| 200 | 35.662 | 35.663 | 35.665 | 35.667 | 26.646 | 26.648 | 26.650 | 26.652 | 21.157 | 21.158 | 21.159 | 21.160 |

*3.2. Molar Enthalpy*

**HV** (GJ/kmol)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **CO2** | | | | **H2O** | | | | **N2** | | | |
| P(bar)→  T(°C) ↓ | 1.0 | **1.1** | 1.2 | 1.3 | 1.0 | **1.1** | 1.2 | 1.3 | 1.0 | **1.1** | 1.2 | 1.3 |
| 20 | -0.3937 | -0.3937 | -0.3937 | -0.3938 | -0.2421 | -0.2421 | -0.2421 | -0.2421 | -0.0002 | -0.0002 | -0.0002 | -0.0002 |
| 23.6 | -0.3936 | -0.3936 | -0.3936 | -0.3936 | -0.2420 | -0.2420 | -0.2420 | -0.2420 | 0.0000 | 0.0000 | 0.0000 | -0.0001 |
| 27.2 | -0.3935 | -0.3935 | -0.3935 | -0.3935 | -0.2418 | -0.2419 | -0.2419 | -0.2419 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| 30.8 | -0.3933 | -0.3933 | -0.3933 | -0.3933 | -0.2417 | -0.2417 | -0.2417 | -0.2417 | 0.0002 | 0.0002 | 0.0002 | 0.0002 |
| 34.4 | -0.3932 | -0.3932 | -0.3932 | -0.3932 | -0.2416 | -0.2416 | -0.2416 | -0.2416 | 0.0003 | 0.0003 | 0.0003 | 0.0003 |
| 38 | -0.3931 | -0.3931 | -0.3931 | -0.3931 | -0.2415 | -0.2415 | -0.2415 | -0.2415 | 0.0004 | 0.0004 | 0.0004 | 0.0004 |
| 41.6 | -0.3929 | -0.3929 | -0.3929 | -0.3929 | -0.2414 | -0.2414 | -0.2414 | -0.2414 | 0.0005 | 0.0005 | 0.0005 | 0.0005 |
| 45.2 | -0.3928 | -0.3928 | -0.3928 | -0.3928 | -0.2412 | -0.2412 | -0.2412 | -0.2413 | 0.0006 | 0.0006 | 0.0006 | 0.0006 |
| 48.8 | -0.3926 | -0.3926 | -0.3927 | -0.3927 | -0.2411 | -0.2411 | -0.2411 | -0.2411 | 0.0007 | 0.0007 | 0.0007 | 0.0007 |
| 52.4 | -0.3925 | -0.3925 | -0.3925 | -0.3925 | -0.2410 | -0.2410 | -0.2410 | -0.2410 | 0.0008 | 0.0008 | 0.0008 | 0.0008 |
| 56 | -0.3924 | -0.3924 | -0.3924 | -0.3924 | -0.2409 | -0.2409 | -0.2409 | -0.2409 | 0.0009 | 0.0009 | 0.0009 | 0.0009 |
| 59.6 | -0.3922 | -0.3922 | -0.3922 | -0.3922 | -0.2407 | -0.2407 | -0.2408 | -0.2408 | 0.0010 | 0.0010 | 0.0010 | 0.0010 |
| 63.2 | -0.3921 | -0.3921 | -0.3921 | -0.3921 | -0.2406 | -0.2406 | -0.2406 | -0.2406 | 0.0011 | 0.0011 | 0.0011 | 0.0011 |
| 66.8 | -0.3919 | -0.3919 | -0.3920 | -0.3920 | -0.2405 | -0.2405 | -0.2405 | -0.2405 | 0.0012 | 0.0012 | 0.0012 | 0.0012 |
| 70.4 | -0.3918 | -0.3918 | -0.3918 | -0.3918 | -0.2404 | -0.2404 | -0.2404 | -0.2404 | 0.0013 | 0.0013 | 0.0013 | 0.0013 |
| 74 | -0.3917 | -0.3917 | -0.3917 | -0.3917 | -0.2402 | -0.2403 | -0.2403 | -0.2403 | 0.0014 | 0.0014 | 0.0014 | 0.0014 |
| 77.6 | -0.3915 | -0.3915 | -0.3915 | -0.3915 | -0.2401 | -0.2401 | -0.2401 | -0.2401 | 0.0015 | 0.0015 | 0.0015 | 0.0015 |
| 81.2 | -0.3914 | -0.3914 | -0.3914 | -0.3914 | -0.2400 | -0.2400 | -0.2400 | -0.2400 | 0.0016 | 0.0016 | 0.0016 | 0.0016 |
| 84.8 | -0.3912 | -0.3912 | -0.3912 | -0.3912 | -0.2399 | -0.2399 | -0.2399 | -0.2399 | 0.0017 | 0.0017 | 0.0017 | 0.0017 |
| 88.4 | -0.3911 | -0.3911 | -0.3911 | -0.3911 | -0.2398 | -0.2398 | -0.2398 | -0.2398 | 0.0018 | 0.0018 | 0.0018 | 0.0018 |
| 92 | -0.3909 | -0.3909 | -0.3909 | -0.3909 | -0.2396 | -0.2396 | -0.2396 | -0.2397 | 0.0019 | 0.0019 | 0.0019 | 0.0019 |
| 95.6 | -0.3908 | -0.3908 | -0.3908 | -0.3908 | -0.2395 | -0.2395 | -0.2395 | -0.2395 | 0.0021 | 0.0021 | 0.0021 | 0.0021 |
| 99.2 | -0.3906 | -0.3906 | -0.3907 | -0.3907 | -0.2394 | -0.2394 | -0.2394 | -0.2394 | 0.0022 | 0.0022 | 0.0022 | 0.0022 |
| 102.8 | -0.3905 | -0.3905 | -0.3905 | -0.3905 | -0.2393 | -0.2393 | -0.2393 | -0.2393 | 0.0023 | 0.0023 | 0.0023 | 0.0023 |
| 106.4 | -0.3904 | -0.3904 | -0.3904 | -0.3904 | -0.2391 | -0.2391 | -0.2391 | -0.2392 | 0.0024 | 0.0024 | 0.0024 | 0.0024 |
| 110 | -0.3902 | -0.3902 | -0.3902 | -0.3902 | -0.2390 | -0.2390 | -0.2390 | -0.2390 | 0.0025 | 0.0025 | 0.0025 | 0.0025 |
| 113.6 | -0.3901 | -0.3901 | -0.3901 | -0.3901 | -0.2389 | -0.2389 | -0.2389 | -0.2389 | 0.0026 | 0.0026 | 0.0026 | 0.0026 |
| 117.2 | -0.3899 | -0.3899 | -0.3899 | -0.3899 | -0.2388 | -0.2388 | -0.2388 | -0.2388 | 0.0027 | 0.0027 | 0.0027 | 0.0027 |
| 120.8 | -0.3898 | -0.3898 | -0.3898 | -0.3898 | -0.2386 | -0.2386 | -0.2387 | -0.2387 | 0.0028 | 0.0028 | 0.0028 | 0.0028 |
| 124.4 | -0.3896 | -0.3896 | -0.3896 | -0.3896 | -0.2385 | -0.2385 | -0.2385 | -0.2385 | 0.0029 | 0.0029 | 0.0029 | 0.0029 |
| 128 | -0.3895 | -0.3895 | -0.3895 | -0.3895 | -0.2384 | -0.2384 | -0.2384 | -0.2384 | 0.0030 | 0.0030 | 0.0030 | 0.0030 |
| 131.6 | -0.3893 | -0.3893 | -0.3893 | -0.3893 | -0.2383 | -0.2383 | -0.2383 | -0.2383 | 0.0031 | 0.0031 | 0.0031 | 0.0031 |
| 135.2 | -0.3892 | -0.3892 | -0.3892 | -0.3892 | -0.2381 | -0.2381 | -0.2382 | -0.2382 | 0.0032 | 0.0032 | 0.0032 | 0.0032 |
| 138.8 | -0.3890 | -0.3890 | -0.3890 | -0.3890 | -0.2380 | -0.2380 | -0.2380 | -0.2380 | 0.0033 | 0.0033 | 0.0033 | 0.0033 |
| 142.4 | -0.3889 | -0.3889 | -0.3889 | -0.3889 | -0.2379 | -0.2379 | -0.2379 | -0.2379 | 0.0034 | 0.0034 | 0.0034 | 0.0034 |
| 146 | -0.3887 | -0.3887 | -0.3887 | -0.3887 | -0.2378 | -0.2378 | -0.2378 | -0.2378 | 0.0035 | 0.0035 | 0.0035 | 0.0035 |
| 149.6 | -0.3885 | -0.3885 | -0.3885 | -0.3886 | -0.2376 | -0.2377 | -0.2377 | -0.2377 | 0.0036 | 0.0036 | 0.0036 | 0.0036 |
| 153.2 | -0.3884 | -0.3884 | -0.3884 | -0.3884 | -0.2375 | -0.2375 | -0.2375 | -0.2375 | 0.0037 | 0.0037 | 0.0037 | 0.0037 |
| 156.8 | -0.3882 | -0.3882 | -0.3882 | -0.3882 | -0.2374 | -0.2374 | -0.2374 | -0.2374 | 0.0038 | 0.0038 | 0.0038 | 0.0038 |
| 160.4 | -0.3881 | -0.3881 | -0.3881 | -0.3881 | -0.2373 | -0.2373 | -0.2373 | -0.2373 | 0.0040 | 0.0040 | 0.0040 | 0.0040 |
| 164 | -0.3879 | -0.3879 | -0.3879 | -0.3879 | -0.2371 | -0.2372 | -0.2372 | -0.2372 | 0.0041 | 0.0041 | 0.0041 | 0.0041 |
| 167.6 | -0.3878 | -0.3878 | -0.3878 | -0.3878 | -0.2370 | -0.2370 | -0.2370 | -0.2370 | 0.0042 | 0.0042 | 0.0042 | 0.0042 |
| 171.2 | -0.3876 | -0.3876 | -0.3876 | -0.3876 | -0.2369 | -0.2369 | -0.2369 | -0.2369 | 0.0043 | 0.0043 | 0.0043 | 0.0043 |
| 174.8 | -0.3875 | -0.3875 | -0.3875 | -0.3875 | -0.2368 | -0.2368 | -0.2368 | -0.2368 | 0.0044 | 0.0044 | 0.0044 | 0.0044 |
| 178.4 | -0.3873 | -0.3873 | -0.3873 | -0.3873 | -0.2366 | -0.2366 | -0.2367 | -0.2367 | 0.0045 | 0.0045 | 0.0045 | 0.0045 |
| 182 | -0.3872 | -0.3872 | -0.3872 | -0.3872 | -0.2365 | -0.2365 | -0.2365 | -0.2365 | 0.0046 | 0.0046 | 0.0046 | 0.0046 |
| 185.6 | -0.3870 | -0.3870 | -0.3870 | -0.3870 | -0.2364 | -0.2364 | -0.2364 | -0.2364 | 0.0047 | 0.0047 | 0.0047 | 0.0047 |
| 189.2 | -0.3868 | -0.3868 | -0.3868 | -0.3868 | -0.2363 | -0.2363 | -0.2363 | -0.2363 | 0.0048 | 0.0048 | 0.0048 | 0.0048 |
| 192.8 | -0.3867 | -0.3867 | -0.3867 | -0.3867 | -0.2361 | -0.2361 | -0.2362 | -0.2362 | 0.0049 | 0.0049 | 0.0049 | 0.0049 |
| 196.4 | -0.3865 | -0.3865 | -0.3865 | -0.3865 | -0.2360 | -0.2360 | -0.2360 | -0.2360 | 0.0050 | 0.0050 | 0.0050 | 0.0050 |
| 200 | -0.3864 | -0.3864 | -0.3864 | -0.3864 | -0.2359 | -0.2359 | -0.2359 | -0.2359 | 0.0051 | 0.0051 | 0.0051 | 0.0051 |

**HL** (GJ/kmol)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **H2O** | | | | |
| P(bar)→  T(°C) ↓ | 1.0 | 1.1 | **1.12** | 1.2 | 1.3 |
| 20 | -0.28797 | -0.28797 | -0.28797 | -0.28797 | -0.28797 |
| 21.4 | -0.28786 | -0.28786 | -0.28786 | -0.28786 | -0.28786 |
| 22.8 | -0.28774 | -0.28774 | -0.28774 | -0.28774 | -0.28774 |
| 24.2 | -0.28763 | -0.28763 | -0.28763 | -0.28763 | -0.28763 |
| 25.6 | -0.28751 | -0.28751 | -0.28751 | -0.28751 | -0.28751 |
| 27 | -0.28740 | -0.28740 | -0.28740 | -0.28740 | -0.28740 |
| 28.4 | -0.28729 | -0.28729 | -0.28729 | -0.28729 | -0.28729 |
| 29.8 | -0.28717 | -0.28717 | -0.28717 | -0.28717 | -0.28717 |
| 31.2 | -0.28706 | -0.28706 | -0.28706 | -0.28706 | -0.28706 |
| 32.6 | -0.28695 | -0.28695 | -0.28695 | -0.28695 | -0.28695 |
| 34 | -0.28683 | -0.28683 | -0.28683 | -0.28683 | -0.28683 |
| 35.4 | -0.28672 | -0.28672 | -0.28672 | -0.28672 | -0.28672 |
| 36.8 | -0.28661 | -0.28661 | -0.28661 | -0.28661 | -0.28661 |
| 38.2 | -0.28649 | -0.28649 | -0.28649 | -0.28649 | -0.28649 |
| 39.6 | -0.28638 | -0.28638 | -0.28638 | -0.28638 | -0.28638 |
| 41 | -0.28626 | -0.28626 | -0.28626 | -0.28626 | -0.28626 |
| 42.4 | -0.28615 | -0.28615 | -0.28615 | -0.28615 | -0.28615 |
| 43.8 | -0.28604 | -0.28604 | -0.28604 | -0.28604 | -0.28604 |
| 45.2 | -0.28592 | -0.28592 | -0.28592 | -0.28592 | -0.28592 |
| 46.6 | -0.28581 | -0.28581 | -0.28581 | -0.28581 | -0.28581 |
| 48 | -0.28570 | -0.28570 | -0.28570 | -0.28570 | -0.28570 |
| 49.4 | -0.28558 | -0.28558 | -0.28558 | -0.28558 | -0.28558 |
| 50.8 | -0.28547 | -0.28547 | -0.28547 | -0.28547 | -0.28547 |
| 52.2 | -0.28535 | -0.28535 | -0.28535 | -0.28535 | -0.28535 |
| 53.6 | -0.28524 | -0.28524 | -0.28524 | -0.28524 | -0.28524 |
| 55 | -0.28513 | -0.28513 | -0.28513 | -0.28513 | -0.28513 |
| 56.4 | -0.28501 | -0.28501 | -0.28501 | -0.28501 | -0.28501 |
| 57.8 | -0.28490 | -0.28490 | -0.28490 | -0.28490 | -0.28490 |
| 59.2 | -0.28479 | -0.28478 | -0.28478 | -0.28478 | -0.28478 |
| 60.6 | -0.28467 | -0.28467 | -0.28467 | -0.28467 | -0.28467 |
| 62 | -0.28456 | -0.28456 | -0.28456 | -0.28456 | -0.28456 |
| 63.4 | -0.28444 | -0.28444 | -0.28444 | -0.28444 | -0.28444 |
| 64.8 | -0.28433 | -0.28433 | -0.28433 | -0.28433 | -0.28433 |
| 66.2 | -0.28421 | -0.28421 | -0.28421 | -0.28421 | -0.28421 |
| 67.6 | -0.28410 | -0.28410 | -0.28410 | -0.28410 | -0.28410 |
| 69 | -0.28399 | -0.28399 | -0.28399 | -0.28399 | -0.28399 |
| 70.4 | -0.28387 | -0.28387 | -0.28387 | -0.28387 | -0.28387 |
| 71.8 | -0.28376 | -0.28376 | -0.28376 | -0.28376 | -0.28376 |
| 73.2 | -0.28364 | -0.28364 | -0.28364 | -0.28364 | -0.28364 |
| 74.6 | -0.28353 | -0.28353 | -0.28353 | -0.28353 | -0.28353 |
| 76 | -0.28341 | -0.28341 | -0.28341 | -0.28341 | -0.28341 |
| 77.4 | -0.28330 | -0.28330 | -0.28330 | -0.28330 | -0.28330 |
| 78.8 | -0.28319 | -0.28319 | -0.28319 | -0.28319 | -0.28319 |
| 80.2 | -0.28307 | -0.28307 | -0.28307 | -0.28307 | -0.28307 |
| 81.6 | -0.28296 | -0.28296 | -0.28296 | -0.28296 | -0.28296 |
| 83 | -0.28284 | -0.28284 | -0.28284 | -0.28284 | -0.28284 |
| 84.4 | -0.28273 | -0.28273 | -0.28273 | -0.28273 | -0.28273 |
| 85.8 | -0.28261 | -0.28261 | -0.28261 | -0.28261 | -0.28261 |
| 87.2 | -0.28250 | -0.28250 | -0.28250 | -0.28250 | -0.28250 |
| 88.6 | -0.28238 | -0.28238 | -0.28238 | -0.28238 | -0.28238 |
| 90 | -0.28227 | -0.28227 | -0.28227 | -0.28227 | -0.28227 |

*3.3. Density*

**ρL** (kg/m3)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **H2O** | | | | |
| P(bar)→  T(°C) ↓ | 1.0 | 1.1 | **1.12** | 1.2 | 1.3 |
| 20 | 851.40 | 851.40 | 851.40 | 851.40 | 851.40 |
| 21.4 | 850.64 | 850.64 | 850.64 | 850.64 | 850.64 |
| 22.8 | 849.87 | 849.87 | 849.87 | 849.87 | 849.87 |
| 24.2 | 849.09 | 849.09 | 849.10 | 849.10 | 849.10 |
| 25.6 | 848.32 | 848.32 | 848.32 | 848.32 | 848.32 |
| 27 | 847.54 | 847.54 | 847.54 | 847.54 | 847.54 |
| 28.4 | 846.75 | 846.75 | 846.75 | 846.75 | 846.75 |
| 29.8 | 845.96 | 845.96 | 845.96 | 845.96 | 845.96 |
| 31.2 | 845.17 | 845.17 | 845.17 | 845.17 | 845.17 |
| 32.6 | 844.37 | 844.37 | 844.37 | 844.37 | 844.37 |
| 34 | 843.57 | 843.57 | 843.57 | 843.57 | 843.57 |
| 35.4 | 842.77 | 842.77 | 842.77 | 842.77 | 842.77 |
| 36.8 | 841.96 | 841.96 | 841.96 | 841.96 | 841.96 |
| 38.2 | 841.14 | 841.14 | 841.14 | 841.14 | 841.15 |
| 39.6 | 840.32 | 840.33 | 840.33 | 840.33 | 840.33 |
| 41 | 839.50 | 839.50 | 839.50 | 839.51 | 839.51 |
| 42.4 | 838.68 | 838.68 | 838.68 | 838.68 | 838.68 |
| 43.8 | 837.85 | 837.85 | 837.85 | 837.85 | 837.85 |
| 45.2 | 837.01 | 837.01 | 837.01 | 837.01 | 837.02 |
| 46.6 | 836.17 | 836.17 | 836.17 | 836.18 | 836.18 |
| 48 | 835.33 | 835.33 | 835.33 | 835.33 | 835.33 |
| 49.4 | 834.48 | 834.48 | 834.48 | 834.48 | 834.49 |
| 50.8 | 833.63 | 833.63 | 833.63 | 833.63 | 833.63 |
| 52.2 | 832.77 | 832.78 | 832.78 | 832.78 | 832.78 |
| 53.6 | 831.91 | 831.91 | 831.91 | 831.92 | 831.92 |
| 55 | 831.05 | 831.05 | 831.05 | 831.05 | 831.05 |
| 56.4 | 830.18 | 830.18 | 830.18 | 830.18 | 830.18 |
| 57.8 | 829.30 | 829.30 | 829.30 | 829.31 | 829.31 |
| 59.2 | 828.42 | 828.43 | 828.43 | 828.43 | 828.43 |
| 60.6 | 827.54 | 827.54 | 827.54 | 827.54 | 827.54 |
| 62 | 826.65 | 826.65 | 826.65 | 826.66 | 826.66 |
| 63.4 | 825.76 | 825.76 | 825.76 | 825.76 | 825.76 |
| 64.8 | 824.86 | 824.86 | 824.86 | 824.86 | 824.87 |
| 66.2 | 823.96 | 823.96 | 823.96 | 823.96 | 823.96 |
| 67.6 | 823.05 | 823.05 | 823.05 | 823.05 | 823.06 |
| 69 | 822.14 | 822.14 | 822.14 | 822.14 | 822.14 |
| 70.4 | 821.22 | 821.22 | 821.22 | 821.23 | 821.23 |
| 71.8 | 820.30 | 820.30 | 820.30 | 820.30 | 820.31 |
| 73.2 | 819.37 | 819.38 | 819.38 | 819.38 | 819.38 |
| 74.6 | 818.44 | 818.44 | 818.44 | 818.45 | 818.45 |
| 76 | 817.51 | 817.51 | 817.51 | 817.51 | 817.51 |
| 77.4 | 816.56 | 816.57 | 816.57 | 816.57 | 816.57 |
| 78.8 | 815.62 | 815.62 | 815.62 | 815.62 | 815.62 |
| 80.2 | 814.66 | 814.67 | 814.67 | 814.67 | 814.67 |
| 81.6 | 813.71 | 813.71 | 813.71 | 813.71 | 813.71 |
| 83 | 812.75 | 812.75 | 812.75 | 812.75 | 812.75 |
| 84.4 | 811.78 | 811.78 | 811.78 | 811.78 | 811.78 |
| 85.8 | 810.80 | 810.81 | 810.81 | 810.81 | 810.81 |
| 87.2 | 809.83 | 809.83 | 809.83 | 809.83 | 809.83 |
| 88.6 | 808.84 | 808.84 | 808.85 | 808.85 | 808.85 |
| 90 | 807.85 | 807.86 | 807.86 | 807.86 | 807.86 |

*3.4. Steam Properties*

**TD** (°C) and **dHvap** (GJ/kmol)

|  |  |  |
| --- | --- | --- |
| P (bar) | TD (°C) | dHvap (GJ/kmol) |
| 2.5 | 127.41 | 0.03926 |
| 3 | 133.53 | 0.03894 |
| 3.5 | 138.86 | 0.03866 |
| 4 | 143.61 | 0.03840 |
| 4.5 | 147.91 | 0.03816 |
| 5 | 151.84 | 0.03794 |
| 5.5 | 155.46 | 0.03774 |
| 6 | 158.83 | 0.03754 |
| 6.5 | 161.99 | 0.03736 |
| 7 | 164.95 | 0.03718 |
| 8 | 170.41 | 0.03685 |
| 9 | 175.36 | 0.03655 |
| 10 | 179.89 | 0.03626 |

**HV** (GJ/kmol)

|  |  |
| --- | --- |
| P(bar)→  T(°C) ↓ | **6.9** |
| 120 | -0.23908 |
| 121.6 | -0.23902 |
| 123.2 | -0.23896 |
| 124.8 | -0.23890 |
| 126.4 | -0.23884 |
| 128 | -0.23879 |
| 129.6 | -0.23873 |
| 131.2 | -0.23867 |
| 132.8 | -0.23861 |
| 134.4 | -0.23856 |
| 136 | -0.23850 |
| 137.6 | -0.23844 |
| 139.2 | -0.23838 |
| 140.8 | -0.23832 |
| 142.4 | -0.23827 |
| 144 | -0.23821 |
| 145.6 | -0.23815 |
| 147.2 | -0.23809 |
| 148.8 | -0.23804 |
| 150.4 | -0.23798 |
| 152 | -0.23792 |
| 153.6 | -0.23786 |
| 155.2 | -0.23781 |
| 156.8 | -0.23775 |
| 158.4 | -0.23769 |
| 160 | -0.23763 |
| 161.6 | -0.23758 |
| 163.2 | -0.23752 |
| 164.8 | -0.23746 |
| 166.4 | -0.23740 |
| 168 | -0.23734 |
| 169.6 | -0.23729 |
| 171.2 | -0.23723 |
| 172.8 | -0.23717 |
| 174.4 | -0.23711 |
| 176 | -0.23706 |
| 177.6 | -0.23700 |
| 179.2 | -0.23694 |
| 180.8 | -0.23688 |
| 182.4 | -0.23683 |
| 184 | -0.23677 |
| 185.6 | -0.23671 |
| 187.2 | -0.23665 |
| 188.8 | -0.23659 |
| 190.4 | -0.23654 |
| 192 | -0.23648 |
| 193.6 | -0.23642 |
| 195.2 | -0.23636 |
| 196.8 | -0.23631 |
| 198.4 | -0.23625 |
| 200 | -0.23619 |