Designation: ~~D7265 – 12 (Reapproved 2018)~~ D7265 – 23

Standard Specification for Hydrogen Thermophysical Property Tables[1]

This standard is issued under the fixed designation D7265; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 The thermophysical property tables for normal hydrogen are for use in the calculation of the pressure-volume-temperature (PVT), thermodynamic, and transport properties of hydrogen for process design and operations, particularly as they relate to hydrogen fuel cell applications. Tables are provided for gaseous hydrogen at temperatures between 50 K and 500 K at pressures to ~~50~~500 MPa. These tables were developed by the National Institute of Standards and Technology from a Standard Reference Database product REFPROP, version ~~9.0.~~10.0[2].

1.2 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[3]

D4150 Terminology Relating to Gaseous Fuels

3. Applicability

3.1 These tables apply directly only to pure gaseous hydrogen. However, it is expected that they may find substantial use in mathematical models and tables for the thermophysical properties of mixtures containing hydrogen.

4. Terminology

4.1 *Definitions*—For definitions of general terms used in D03 Gaseous Fuels standards, refer to Terminology D4150.

5. Tables

5.1 The tabulated thermophysical properties are:

ρ, molar density ($mol \cdot L^{-1}$)
V, molar volume ($L^{-1} \cdot mol$)
H, molar enthalpy ($J \cdot mol^{-1}$)
S, molar entropy ($J \cdot K^{-1} \cdot mol^{-1}$)

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[1] This specification is under the jurisdiction of ASTM Committee D03 on Gaseous Fuels and is the direct responsibility of Subcommittee D03.08 on Thermophysical Properties.

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[2] Lemmon, E.W., Bell, I.H., Huber, M.L., McLinden, M.O. NIST Standard Reference Database 23: Reference Fluid Thermodynamic and Transport Properties-REFPROP, Version 10.0, National Institute of Standards and Technology, Standard Reference Data Program, Gaithersburg, 2018.

[3] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

C_v, constant volume molar heat capacity ($J \cdot K^{-1} \cdot mol^{-1}$)
C_p, constant pressure molar heat capacity ($J \cdot K^{-1} \cdot mol^{-1}$)
c, speed of sound ($m \cdot s^{-1}$)
η, viscosity (μPa·s)
λ, thermal conductivity ($mW \cdot m^{-1} \cdot K^{-1}$)

5.2 These tables were produced by equations from a computer package, "NIST Standard Reference Database 23; Reference Fluid Thermodynamic and Transport Properties Database (REFPROP): Version ~~9.0."~~10.0." A wide selection of units (SI units, engineering units, chemical units) is available with this program.

6. Additional Information

6.1 The Reference States for enthalpy and entropy have been updated in this version of the Standard.

6.2 ~~A comprehensive equation of state for normal hydrogen is not available at this time. The properties in the table were calculated from individual equations for normal hydrogen.~~Reference state properties are required to calculate certain of the thermodynamic properties (enthalpy, entropy, etc.) from an equation of state formulation.

6.3 The reference state properties used to generate the tables in this specification are: enthalpy, *H*, and entropy, *S*, at 298.15 K and 0.101325 MPa (*H* = 10018 J/mol and *S* = 186.266 J/(mol K)). The molar mass of hydrogen is 2.0159 g/mol.

6.4 Two new tables have been added at 35 Mpa (350 Bar) and 70 Mpa (700 Bar). These are the most common fuel pressures used for vehicles using hydrogen fuel cells.

7. Keywords

7.1 ~~hydrogen fuel cell;~~ hydrogen gas tables; thermodynamic properties of ~~hydrogen~~hydrogen; transport properties of hydrogen

TABLE 1 Hydrogen Thermophysical Property Tables

T (K)	ρ (mol·L^{-1})	V (L^{-1}·mol)	H (J·mol^{-1})	S (J·mol^{-1}·K^{-1})	C_v (J·mol^{-1}·K^{-1})	C_p (J·mol^{-1}·K^{-1})	c (m·s^{-1})	λ (mW·m^{-1}·K^{-1})	η (μPa·s)
				0.1 MPa					
~~50~~	~~0.24247~~	~~4.1243~~	~~1549.8~~	~~64.230~~	~~12.543~~	~~21.131~~	~~584.8~~	~~38.40~~	~~2.4717~~
50	0.242470	4.1243	3641.7	142.90	12.543	21.131	584.75	37.766	2.4059
~~55~~	~~0.21997~~	~~4.5461~~	~~1655.4~~	~~66.243~~	~~12.579~~	~~21.113~~	~~613.4~~	~~41.52~~	~~2.6729~~
55	0.219970	4.5461	3747.3	144.91	12.579	21.113	613.42	40.905	2.6017
~~60~~	~~0.20134~~	~~4.9668~~	~~1761.0~~	~~68.081~~	~~12.643~~	~~21.137~~	~~640.4~~	~~44.60~~	~~2.8655~~
60	0.201340	4.9668	3852.9	146.75	12.643	21.137	640.40	43.986	2.7904
~~65~~	~~0.18565~~	~~5.3866~~	~~1866.8~~	~~69.775~~	~~12.740~~	~~21.204~~	~~665.8~~	~~47.68~~	~~3.0502~~
65	0.185650	5.3866	3958.8	148.44	12.740	21.204	665.79	47.025	2.9728
~~70~~	~~0.17224~~	~~5.8057~~	~~1973.1~~	~~71.350~~	~~12.871~~	~~21.312~~	~~689.7~~	~~50.78~~	~~3.2281~~
70	0.172240	5.8057	4065.0	150.02	12.871	21.312	689.70	50.040	3.1496
~~75~~	~~0.16066~~	~~6.2244~~	~~2080.0~~	~~72.825~~	~~13.037~~	~~21.460~~	~~712.3~~	~~53.61~~	~~3.3999~~
75	0.160660	6.2244	4171.9	151.49	13.037	21.460	712.26	53.046	3.3215
~~80~~	~~0.15054~~	~~6.6426~~	~~2187.7~~	~~74.216~~	~~13.235~~	~~21.643~~	~~733.6~~	~~56.47~~	~~3.5663~~
80	0.150540	6.6426	4279.7	152.88	13.235	21.643	733.56	56.059	3.4888
~~85~~	~~0.14163~~	~~7.0605~~	~~2296.5~~	~~75.534~~	~~13.462~~	~~21.858~~	~~753.8~~	~~59.35~~	~~3.7280~~
85	0.141630	7.0605	4388.4	154.20	13.462	21.858	753.75	59.089	3.6520
~~90~~	~~0.13372~~	~~7.4781~~	~~2406.4~~	~~76.791~~	~~13.712~~	~~22.098~~	~~773.0~~	~~62.17~~	~~3.8855~~
90	0.133720	7.4781	4498.3	155.46	13.712	22.098	772.95	62.146	3.8114
~~95~~	~~0.12665~~	~~7.8955~~	~~2517.5~~	~~77.992~~	~~13.981~~	~~22.359~~	~~791.3~~	~~65.26~~	~~4.0392~~
95	0.126650	7.8955	4609.4	156.66	13.981	22.359	791.27	65.237	3.9674
~~100~~	~~0.12030~~	~~8.3127~~	~~2630.0~~	~~79.146~~	~~14.264~~	~~22.635~~	~~808.9~~	~~68.33~~	~~4.1896~~
100	0.120300	8.3127	4721.9	157.81	14.264	22.635	808.85	68.365	4.1202
~~105~~	~~0.11455~~	~~8.7298~~	~~2743.9~~	~~80.257~~	~~14.556~~	~~22.921~~	~~825.8~~	~~71.65~~	~~4.3368~~
105	0.114550	8.7298	4835.8	158.92	14.556	22.921	825.77	71.531	4.2701
~~110~~	~~0.10933~~	~~9.1467~~	~~2859.2~~	~~81.330~~	~~14.852~~	~~23.212~~	~~842.1~~	~~74.97~~	~~4.4813~~
110	0.109330	9.1467	4951.1	160.00	14.852	23.212	842.14	74.735	4.4172
~~115~~	~~0.10456~~	~~9.5635~~	~~2976.0~~	~~82.369~~	~~15.150~~	~~23.506~~	~~858.0~~	~~78.22~~	~~4.6232~~
115	0.104560	9.5635	5067.9	161.04	15.150	23.506	858.02	77.974	4.5619
~~120~~	~~0.10020~~	~~9.9802~~	~~3094.2~~	~~83.375~~	~~15.446~~	~~23.798~~	~~873.5~~	~~81.48~~	~~4.7629~~
120	0.100200	9.9802	5186.2	162.04	15.446	23.798	873.50	81.242	4.7041
~~125~~	~~0.09618~~	~~10.3970~~	~~3214.0~~	~~84.352~~	~~15.738~~	~~24.086~~	~~888.6~~	~~84.78~~	~~4.9004~~
125	0.096183	10.397	5305.9	163.02	15.738	24.086	888.61	84.534	4.8441
~~130~~	~~0.09248~~	~~10.8130~~	~~3335.1~~	~~85.303~~	~~16.023~~	~~24.368~~	~~903.4~~	~~88.09~~	~~5.0359~~
130	0.092478	10.813	5427.0	163.97	16.023	24.368	903.41	87.845	4.9821
~~135~~	~~0.08905~~	~~11.2300~~	~~3457.6~~	~~86.228~~	~~16.300~~	~~24.643~~	~~917.9~~	~~91.36~~	~~5.1696~~
135	0.089049	11.230	5549.6	164.89	16.300	24.643	917.93	91.167	5.1181
~~140~~	~~0.08587~~	~~11.6460~~	~~3581.5~~	~~87.129~~	~~16.568~~	~~24.908~~	~~932.2~~	~~94.62~~	~~5.3015~~
140	0.085865	11.646	5673.5	165.79	16.568	24.908	932.21	94.493	5.2522
~~145~~	~~0.08290~~	~~12.0630~~	~~3706.7~~	~~88.007~~	~~16.825~~	~~25.164~~	~~946.3~~	~~97.79~~	~~5.4318~~
145	0.082901	12.063	5798.6	166.67	16.825	25.164	946.27	97.819	5.3846
~~150~~	~~0.08014~~	~~12.4790~~	~~3833.1~~	~~88.864~~	~~17.073~~	~~25.410~~	~~960.1~~	~~100.96~~	~~5.5606~~
150	0.080135	12.479	5925.1	167.53	17.073	25.410	960.13	101.14	5.5154
~~155~~	~~0.07755~~	~~12.8950~~	~~3960.8~~	~~89.701~~	~~17.309~~	~~25.645~~	~~973.8~~	~~104.24~~	~~5.6880~~
155	0.077549	12.895	6052.7	168.37	17.309	25.645	973.80	104.44	5.6446
~~160~~	~~0.07512~~	~~13.3110~~	~~4089.6~~	~~90.519~~	~~17.535~~	~~25.869~~	~~987.3~~	~~107.51~~	~~5.8140~~
160	0.075124	13.311	6181.5	169.19	17.535	25.869	987.30	107.73	5.7723
~~165~~	~~0.07285~~	~~13.7280~~	~~4219.4~~	~~91.318~~	~~17.750~~	~~26.082~~	~~1000.6~~	~~110.74~~	~~5.9387~~
165	0.072846	13.728	6311.4	169.98	17.750	26.082	1000.6	110.99	5.8985
~~170~~	~~0.07070~~	~~14.1440~~	~~4350.4~~	~~92.100~~	~~17.954~~	~~26.285~~	~~1013.8~~	~~113.98~~	~~6.0622~~
170	0.070703	14.144	6442.3	170.77	17.954	26.285	1013.8	114.23	6.0235
~~175~~	~~0.06868~~	~~14.5600~~	~~4482.3~~	~~92.865~~	~~18.147~~	~~26.477~~	~~1026.9~~	~~117.11~~	~~6.1845~~
175	0.068682	14.560	6574.2	171.53	18.147	26.477	1026.9	117.45	6.1471
~~180~~	~~0.06677~~	~~14.9760~~	~~4615.1~~	~~93.613~~	~~18.330~~	~~26.659~~	~~1039.8~~	~~120.25~~	~~6.3056~~
180	0.066774	14.976	6707.1	172.28	18.330	26.659	1039.8	120.63	6.2695
~~185~~	~~0.06497~~	~~15.3920~~	~~4748.8~~	~~94.346~~	~~18.503~~	~~26.831~~	~~1052.6~~	~~123.34~~	~~6.4257~~
185	0.064969	15.392	6840.8	173.01	18.503	26.831	1052.6	123.77	6.3908
~~190~~	~~0.06326~~	~~15.8080~~	~~4883.4~~	~~95.064~~	~~18.666~~	~~26.994~~	~~1065.3~~	~~126.44~~	~~6.5447~~
190	0.063259	15.808	6975.4	173.73	18.666	26.994	1065.3	126.89	6.5109
~~195~~	~~0.06164~~	~~16.2240~~	~~5018.8~~	~~95.767~~	~~18.821~~	~~27.147~~	~~1077.8~~	~~129.44~~	~~6.6627~~
195	0.061637	16.224	7110.7	174.43	18.821	27.147	1077.8	129.96	6.6299
~~200~~	~~0.06010~~	~~16.6400~~	~~5154.9~~	~~96.456~~	~~18.966~~	~~27.292~~	~~1090.2~~	~~132.44~~	~~6.7798~~
200	0.060096	16.640	7246.8	175.12	18.966	27.292	1090.2	133.00	6.7480
~~205~~	~~0.05863~~	~~17.0560~~	~~5291.7~~	~~97.132~~	~~19.103~~	~~27.428~~	~~1102.6~~	~~135.39~~	~~6.8958~~
205	0.058630	17.056	7383.6	175.80	19.103	27.428	1102.6	136.01	6.8650
~~210~~	~~0.05723~~	~~17.4720~~	~~5429.1~~	~~97.794~~	~~19.231~~	~~27.556~~	~~1114.8~~	~~138.34~~	~~7.0110~~
210	0.057234	17.472	7521.1	176.46	19.231	27.556	1114.8	138.97	6.9810
~~215~~	~~0.05590~~	~~17.8880~~	~~5567.2~~	~~98.444~~	~~19.352~~	~~27.676~~	~~1126.9~~	~~141.20~~	~~7.1253~~
215	0.055903	17.888	7659.2	177.11	19.352	27.676	1126.9	141.90	7.0961
~~220~~	~~0.05463~~	~~18.3040~~	~~5705.9~~	~~99.082~~	~~19.465~~	~~27.789~~	~~1138.9~~	~~144.07~~	~~7.2387~~
220	0.054633	18.304	7797.8	177.75	19.465	27.789	1138.9	144.80	7.2104
~~225~~	~~0.05342~~	~~18.7200~~	~~5845.1~~	~~99.707~~	~~19.572~~	~~27.895~~	~~1150.8~~	~~146.88~~	~~7.3513~~
225	0.053419	18.720	7937.0	178.37	19.572	27.895	1150.8	147.65	7.3238
~~230~~	~~0.05226~~	~~19.1360~~	~~5984.8~~	~~100.320~~	~~19.672~~	~~27.994~~	~~1162.6~~	~~149.70~~	~~7.4631~~

TABLE 1 *Continued*

T (K)	ρ (mol·L^{-1})	V (L^{-1}·mol)	H (J·mol^{-1})	S (J·mol^{-1}·K^{-1})	C_v (J·mol^{-1}·K^{-1})	C_p (J·mol^{-1}·K^{-1})	c (m·s^{-1})	λ (mW·m^{-1}·K^{-1})	η (μPa·s)
230	0.052258	19.136	8076.8	178.99	19.672	27.994	1162.6	150.47	7.4363
235	0.05115	19.5520	6125.0	100.920	19.765	28.087	1174.4	152.46	7.5741
235	0.051146	19.552	8217.0	179.59	19.765	28.087	1174.4	153.26	7.5481
240	0.05008	19.9680	6265.7	101.520	19.852	28.174	1186.0	155.24	7.6843
240	0.050081	19.968	8357.6	180.18	19.852	28.174	1186.0	156.01	7.6591
245	0.04906	20.3840	6406.7	102.100	19.934	28.255	1197.6	157.91	7.7938
245	0.049059	20.384	8498.7	180.77	19.934	28.255	1197.6	158.73	7.7693
250	0.04808	20.8000	6548.2	102.670	20.010	28.331	1209.0	160.59	7.9025
250	0.048078	20.799	8640.2	181.34	20.010	28.331	1209.0	161.42	7.8788
255	0.04714	21.2150	6690.0	103.230	20.081	28.402	1220.4	163.21	8.0105
255	0.047136	21.215	8782.0	181.90	20.081	28.402	1220.4	164.07	7.9876
260	0.04623	21.6310	6832.2	103.780	20.148	28.468	1231.7	165.84	8.1178
260	0.046229	21.631	8924.2	182.45	20.148	28.468	1231.7	166.70	8.0957
265	0.04536	22.0470	6974.7	104.330	20.209	28.529	1242.9	168.43	8.2245
265	0.045357	22.047	9066.7	182.99	20.209	28.529	1242.9	169.29	8.2032
270	0.04452	22.4630	7117.5	104.860	20.267	28.587	1254.1	171.01	8.3305
270	0.044518	22.463	9209.5	183.53	20.267	28.587	1254.1	171.86	8.3100
275	0.04371	22.8790	7260.6	105.390	20.320	28.640	1265.1	173.50	8.4358
275	0.043709	22.879	9352.5	184.05	20.320	28.640	1265.1	174.40	8.4162
280	0.04293	23.2950	7403.9	105.900	20.370	28.689	1276.1	175.99	8.5405
280	0.042928	23.295	9495.9	184.57	20.370	28.689	1276.1	176.91	8.5218
285	0.04218	23.7110	7547.5	106.410	20.416	28.735	1287.0	178.48	8.6445
285	0.042175	23.710	9639.4	185.08	20.416	28.735	1287.0	179.39	8.6268
290	0.04145	24.1260	7691.2	106.910	20.459	28.777	1297.9	180.97	8.7480
290	0.041449	24.126	9783.2	185.58	20.458	28.777	1297.9	181.85	8.7313
295	0.04075	24.5420	7835.2	107.400	20.498	28.817	1308.6	183.37	8.8508
295	0.040746	24.542	9927.2	186.07	20.498	28.817	1308.6	184.29	8.8351
300	0.04007	24.9580	7979.4	107.890	20.534	28.853	1319.3	185.76	8.9531
300	0.040067	24.958	10071	186.55	20.534	28.853	1319.3	186.70	8.9385
305	0.03941	25.3740	8123.8	108.360	20.568	28.886	1329.9	188.16	9.0548
305	0.039411	25.374	10216	187.03	20.568	28.886	1329.9	189.09	9.0413
310	0.03878	25.7900	8268.3	108.830	20.599	28.917	1340.5	190.56	9.1559
310	0.038775	25.790	10360	187.50	20.599	28.917	1340.5	191.45	9.1435
315	0.03816	26.2050	8412.9	109.300	20.628	28.946	1351.0	192.86	9.2565
315	0.038160	26.205	10505	187.96	20.628	28.946	1351.0	193.80	9.2453
320	0.03756	26.6210	8557.7	109.750	20.654	28.972	1361.4	195.17	9.3566
320	0.037564	26.621	10650	188.42	20.654	28.972	1361.4	196.12	9.3466
325	0.03699	27.0370	8702.6	110.200	20.679	28.996	1371.8	197.72	9.4561
325	0.036986	27.037	10795	188.87	20.679	28.996	1371.8	198.43	9.4474
330	0.03643	27.4530	8847.7	110.650	20.701	29.018	1382.0	200.28	9.5551
330	0.036426	27.453	10940	189.31	20.701	29.018	1382.0	200.72	9.5478
335	0.03588	27.8690	8992.8	111.080	20.722	29.039	1392.3	202.79	9.6536
335	0.035883	27.869	11085	189.75	20.722	29.039	1392.3	202.98	9.6476
340	0.03536	28.2840	9138.1	111.510	20.740	29.058	1402.4	205.30	9.7515
340	0.035355	28.284	11230	190.18	20.740	29.057	1402.4	205.24	9.7471
345	0.03484	28.7000	9283.4	111.940	20.758	29.075	1412.5	207.81	9.8490
345	0.034843	28.700	11375	190.60	20.758	29.075	1412.5	207.47	9.8461
350	0.03435	29.1160	9428.8	112.360	20.773	29.090	1422.6	210.32	9.9461
350	0.034345	29.116	11521	191.02	20.773	29.090	1422.6	209.69	9.9446
355	0.03386	29.5320	9574.3	112.770	20.788	29.105	1432.5	212.79	10.0430
355	0.033862	29.532	11666	191.43	20.788	29.105	1432.5	211.89	10.043
360	0.03339	29.9480	9719.9	113.180	20.801	29.118	1442.4	215.26	10.1390
360	0.033392	29.948	11812	191.84	20.801	29.118	1442.4	214.08	10.141
365	0.03293	30.3630	9865.5	113.580	20.813	29.130	1452.3	217.58	10.2340
365	0.032934	30.363	11957	192.24	20.813	29.130	1452.3	216.25	10.238
370	0.03249	30.7790	10011.0	113.970	20.824	29.141	1462.1	219.90	10.3300
370	0.032490	30.779	12103	192.64	20.824	29.141	1462.1	218.41	10.335
375	0.03206	31.1950	10157.0	114.360	20.834	29.151	1471.8	222.32	10.4240
375	0.032057	31.195	12249	193.03	20.834	29.151	1471.8	220.55	10.431
380	0.03164	31.6110	10303.0	114.750	20.843	29.160	1481.5	224.74	10.5190
380	0.031635	31.611	12395	193.42	20.843	29.160	1481.5	222.69	10.528
385	0.03122	32.0260	10448.0	115.130	20.852	29.168	1491.1	227.07	10.6130
385	0.031224	32.026	12540	193.80	20.852	29.168	1491.1	224.81	10.623
390	0.03082	32.4420	10594.0	115.510	20.859	29.175	1500.7	229.40	10.7060
390	0.030824	32.442	12686	194.18	20.859	29.175	1500.7	226.91	10.719
395	0.03043	32.8580	10740.0	115.880	20.866	29.182	1510.2	231.72	10.7990
395	0.030434	32.858	12832	194.55	20.866	29.182	1510.2	229.01	10.814\
400	0.03005	33.2740	10886.0	116.250	20.873	29.189	1519.6	234.06	10.8920
400	0.030054	33.274	12978	194.91	20.873	29.189	1519.6	231.09	10.909
405	0.02968	33.6900	11032.0	116.610	20.878	29.194	1529.0	236.14	10.9840
405	0.029683	33.689	13124	195.28	20.878	29.194	1529.0	233.17	11.003
410	0.02932	34.1050	11178.0	116.970	20.884	29.200	1538.4	238.22	11.0760
410	0.029321	34.105	13270	195.63	20.884	29.200	1538.4	235.23	11.097
415	0.02897	34.5210	11324.0	117.320	20.889	29.205	1547.7	240.56	11.1680

TABLE 1 *Continued*

T (K)	ρ (mol·L^{-1})	V (L^{-1}·mol)	H (J·mol^{-1})	S (J·mol^{-1}·K^{-1})	C_v (J·mol^{-1}·K^{-1})	C_p (J·mol^{-1}·K^{-1})	c (m·s^{-1})	λ (mW·m^{-1}·K^{-1})	η (μPa·s)
415	0.028968	34.521	13416	195.99	20.889	29.205	1547.7	237.29	11.191
420	0.02862	34.9370	11470.0	117.670	20.893	29.209	1556.9	242.89	11.2590
420	0.028623	34.937	13562	196.34	20.893	29.209	1556.9	239.33	11.284
425	0.02829	35.3530	11616.0	118.020	20.897	29.213	1566.1	245.23	11.3500
425	0.028287	35.352	13708	196.68	20.897	29.213	1566.1	241.37	11.377
430	0.02796	35.7680	11762.0	118.360	20.901	29.217	1575.2	247.57	11.4400
430	0.027958	35.768	13854	197.03	20.901	29.217	1575.2	243.40	11.470
435	0.02764	36.1840	11908.0	118.700	20.905	29.221	1584.3	249.91	11.5300
435	0.027637	36.184	14000	197.36	20.905	29.221	1584.3	245.42	11.562
440	0.02732	36.6000	12054.0	119.030	20.908	29.224	1593.4	252.26	11.6200
440	0.027323	36.600	14146	197.70	20.908	29.224	1593.4	247.43	11.655
445	0.02702	37.0160	12201.0	119.360	20.912	29.227	1602.3	254.60	11.7090
445	0.027016	37.015	14293	198.03	20.912	29.227	1602.3	249.43	11.746
450	0.02672	37.4310	12347.0	119.690	20.915	29.230	1611.3	256.95	11.7980
450	0.026716	37.431	14439	198.35	20.915	29.230	1611.3	251.42	11.838
455	0.02642	37.8470	12493.0	120.010	20.917	29.233	1620.2	259.30	11.8870
455	0.026422	37.847	14585	198.68	20.917	29.233	1620.2	253.41	11.929
460	0.02614	38.2630	12639.0	120.330	20.920	29.236	1629.0	261.65	11.9750
460	0.026135	38.263	14731	199.00	20.920	29.236	1629.0	255.40	12.020
465	0.02585	38.6790	12785.0	120.650	20.923	29.238	1637.8	264.00	12.0630
465	0.025854	38.678	14877	199.31	20.923	29.238	1637.8	257.37	12.111
470	0.02558	39.0940	12931.0	120.960	20.926	29.241	1646.5	266.35	12.1510
470	0.025579	39.094	15023	199.63	20.926	29.241	1646.5	259.34	12.201
475	0.02531	39.5100	13078.0	121.270	20.928	29.244	1655.2	268.71	12.2390
475	0.025310	39.510	15170	199.94	20.928	29.244	1655.2	261.30	12.292
480	0.02505	39.9260	13224.0	121.580	20.931	29.246	1663.9	271.06	12.3260
480	0.025047	39.926	15316	200.24	20.931	29.246	1663.9	263.26	12.381
485	0.02479	40.3420	13370.0	121.880	20.933	29.249	1672.5	273.42	12.4130
485	0.024788	40.341	15462	200.54	20.933	29.249	1672.5	265.21	12.471
490	0.02454	40.7570	13516.0	122.180	20.936	29.251	1681.1	275.78	12.4990
490	0.024536	40.757	15608	200.84	20.936	29.251	1681.1	267.16	12.560
495	0.02429	41.1730	13663.0	122.480	20.939	29.254	1689.6	278.14	12.5860
495	0.024288	41.173	15755	201.14	20.939	29.254	1689.6	269.10	12.649
500	0.02405	41.5890	13809.0	122.770	20.941	29.256	1698.0	280.50	12.6720
500	0.024045	41.589	15901	201.44	20.941	29.256	1698.0	271.03	12.738
				0.2 MPa					
50	0.48886	2.0456	1539.6	58.330	12.577	21.451	583.6	38.74	2.4854
50	0.48887	2.0456	3631.6	137.00	12.577	21.451	583.60	38.363	2.4174
55	0.44256	2.2596	1646.6	60.370	12.606	21.366	612.8	41.83	2.6855
55	0.44256	2.2596	3738.6	139.04	12.606	21.366	612.77	41.449	2.6124
60	0.40446	2.4724	1753.4	62.228	12.665	21.343	640.1	44.89	2.8770
60	0.40446	2.4724	3845.3	140.89	12.665	21.343	640.11	44.487	2.8003
65	0.37252	2.6844	1860.2	63.937	12.758	21.374	665.8	47.94	3.0609
65	0.37253	2.6844	3952.1	142.60	12.758	21.374	665.78	47.490	2.9820
70	0.34534	2.8957	1967.2	65.524	12.886	21.456	689.9	51.02	3.2381
70	0.34534	2.8957	4059.2	144.19	12.886	21.456	689.91	50.474	3.1582
75	0.32191	3.1065	2074.8	67.008	13.050	21.582	712.6	53.85	3.4093
75	0.32191	3.1065	4166.8	145.67	13.050	21.582	712.63	53.454	3.3294
80	0.30149	3.3168	2183.1	68.406	13.246	21.749	734.1	56.72	3.5752
80	0.30149	3.3168	4275.1	147.07	13.246	21.749	734.06	56.444	3.4961
85	0.28354	3.5269	2292.3	69.731	13.472	21.950	754.4	59.62	3.7364
85	0.28354	3.5269	4384.3	148.40	13.472	21.950	754.35	59.453	3.6587
90	0.26762	3.7366	2402.7	70.992	13.721	22.179	773.6	62.43	3.8935
90	0.26762	3.7366	4494.6	149.66	13.721	22.179	773.62	62.493	3.8177
95	0.25341	3.9462	2514.2	72.197	13.989	22.430	792.0	65.50	4.0468
95	0.25341	3.9462	4606.1	150.86	13.989	22.430	792.01	65.568	3.9732
100	0.24064	4.1555	2627.0	73.355	14.271	22.698	809.6	68.57	4.1968
100	0.24064	4.1555	4718.9	152.02	14.271	22.698	809.63	68.681	4.1256
105	0.22911	4.3647	2741.2	74.469	14.562	22.978	826.6	71.88	4.3437
105	0.22911	4.3647	4833.1	153.14	14.562	22.978	826.59	71.835	4.2751
110	0.21864	4.5738	2856.8	75.544	14.858	23.264	843.0	75.19	4.4878
110	0.21864	4.5738	4948.7	154.21	14.858	23.264	842.99	75.027	4.4219
115	0.20909	4.7827	2973.8	76.585	15.156	23.552	858.9	78.43	4.6295
115	0.20909	4.7827	5065.8	155.25	15.156	23.552	858.90	78.254	4.5662
120	0.20034	4.9916	3092.3	77.593	15.451	23.840	874.4	81.67	4.7689
120	0.20034	4.9916	5184.2	156.26	15.451	23.840	874.39	81.513	4.7082
125	0.19230	5.2003	3212.2	78.572	15.742	24.125	889.5	84.97	4.9061
125	0.19230	5.2003	5304.2	157.24	15.742	24.125	889.52	84.796	4.8480
130	0.18488	5.4090	3333.5	79.524	16.027	24.404	904.3	88.28	5.0414
130	0.18488	5.4090	5425.5	158.19	16.027	24.404	904.33	88.098	4.9857
135	0.17801	5.6176	3456.2	80.450	16.304	24.675	918.9	91.53	5.1749
135	0.17801	5.6176	5548.2	159.12	16.304	24.675	918.87	91.412	5.1215
140	0.17164	5.8261	3580.3	81.352	16.572	24.938	933.2	94.79	5.3066
140	0.17164	5.8261	5672.2	160.02	16.572	24.938	933.15	94.732	5.2554

TABLE 1 *Continued*

T (K)	ρ (mol·L^{-1})	V (L^{-1}·mol)	H (J·mol^{-1})	S (J·mol^{-1}·K^{-1})	C_v (J·mol^{-1}·K^{-1})	C_p (J·mol^{-1}·K^{-1})	c (m·s^{-1})	λ (mW·m^{-1}·K^{-1})	η (μPa·s)
145	0.16571	6.0346	3705.6	82.232	16.829	25.192	947.2	97.96	5.4368
145	0.16571	6.0346	5797.6	160.90	16.829	25.192	947.21	98.051	5.3876
150	0.16018	6.2431	3832.2	83.090	17.076	25.436	961.1	101.12	5.5654
150	0.16018	6.2431	5924.1	161.76	17.076	25.436	961.07	101.36	5.5182
155	0.15500	6.4515	3959.9	83.928	17.313	25.669	974.8	104.39	5.6926
155	0.15500	6.4515	6051.9	162.59	17.313	25.669	974.75	104.66	5.6472
160	0.15015	6.6598	4088.8	84.746	17.538	25.891	988.3	107.67	5.8185
160	0.15015	6.6598	6180.8	163.41	17.538	25.891	988.25	107.94	5.7747
165	0.14560	6.8682	4218.8	85.546	17.753	26.103	1001.6	110.89	5.9431
165	0.14560	6.8681	6310.8	164.21	17.753	26.103	1001.6	111.20	5.9009
170	0.14131	7.0764	4349.9	86.329	17.957	26.304	1014.8	114.12	6.0664
170	0.14131	7.0764	6441.8	165.00	17.957	26.304	1014.8	114.44	6.0257
175	0.13727	7.2847	4481.9	87.094	18.150	26.496	1027.8	117.25	6.1886
175	0.13727	7.2847	6573.8	165.76	18.150	26.495	1027.8	117.65	6.1492
180	0.13346	7.4929	4614.8	87.843	18.333	26.676	1040.7	120.39	6.3096
180	0.13346	7.4929	6706.8	166.51	18.333	26.676	1040.7	120.82	6.2715
185	0.12985	7.7012	4748.6	88.576	18.506	26.848	1053.5	123.48	6.4296
185	0.12985	7.7011	6840.6	167.24	18.506	26.847	1053.5	123.96	6.3927
190	0.12643	7.9093	4883.3	89.294	18.669	27.009	1066.2	126.57	6.5485
190	0.12643	7.9093	6975.2	167.96	18.669	27.009	1066.2	127.07	6.5127
195	0.12319	8.1175	5018.7	89.998	18.823	27.162	1078.7	129.56	6.6664
195	0.12319	8.1175	7110.6	168.66	18.823	27.162	1078.7	130.15	6.6316
200	0.12011	8.3257	5154.9	90.687	18.968	27.305	1091.2	132.56	6.7833
200	0.12011	8.3257	7246.8	169.35	18.968	27.305	1091.2	133.18	6.7495
205	0.11718	8.5338	5291.7	91.363	19.105	27.441	1103.5	135.51	6.8993
205	0.11718	8.5338	7383.7	170.03	19.105	27.441	1103.5	136.18	6.8665
210	0.11439	8.7419	5429.3	92.026	19.234	27.568	1115.7	138.47	7.0144
210	0.11439	8.7419	7521.2	170.69	19.234	27.568	1115.7	139.15	6.9824
215	0.11173	8.9500	5567.4	92.676	19.354	27.688	1127.8	141.32	7.1286
215	0.11173	8.9500	7659.3	171.34	19.354	27.688	1127.8	142.07	7.0975
220	0.10919	9.1581	5706.1	93.314	19.468	27.800	1139.8	144.18	7.2420
220	0.10919	9.1581	7798.1	171.98	19.468	27.800	1139.8	144.96	7.2117
225	0.10677	9.3662	5845.4	93.940	19.574	27.905	1151.7	146.99	7.3545
225	0.10677	9.3662	7937.3	172.61	19.574	27.905	1151.7	147.82	7.3250
230	0.10445	9.5743	5985.2	94.554	19.674	28.004	1163.6	149.81	7.4662
230	0.10445	9.5742	8077.1	173.22	19.674	28.004	1163.6	150.64	7.4375
235	0.10223	9.7823	6125.4	95.158	19.767	28.097	1175.3	152.57	7.5771
235	0.10223	9.7823	8217.4	173.82	19.767	28.097	1175.3	153.42	7.5492
240	0.10010	9.9904	6266.1	95.750	19.854	28.183	1186.9	155.34	7.6873
240	0.10010	9.9903	8358.1	174.42	19.854	28.183	1186.9	156.17	7.6601
245	0.09806	10.1980	6407.2	96.332	19.936	28.264	1198.5	158.02	7.7967
245	0.098055	10.198	8499.2	175.00	19.936	28.264	1198.5	158.89	7.7703
250	0.09610	10.4060	6548.7	96.904	20.012	28.339	1209.9	160.69	7.9054
250	0.096095	10.406	8640.7	175.57	20.012	28.339	1209.9	161.57	7.8797
255	0.09421	10.6140	6690.6	97.466	20.083	28.410	1221.3	163.32	8.0133
255	0.094211	10.614	8782.6	176.13	20.083	28.410	1221.3	164.22	7.9885
260	0.09240	10.8220	6832.8	98.018	20.150	28.476	1232.6	165.95	8.1206
260	0.092401	10.822	8924.8	176.68	20.150	28.476	1232.6	166.85	8.0966
265	0.09066	11.0300	6975.4	98.561	20.211	28.537	1243.8	168.53	8.2272
265	0.090658	11.030	9067.3	177.23	20.211	28.537	1243.8	169.44	8.2040
270	0.08898	11.2380	7118.2	99.095	20.269	28.594	1254.9	171.11	8.3331
270	0.088980	11.238	9210.1	177.76	20.269	28.594	1254.9	172.00	8.3108
275	0.08736	11.4460	7261.3	99.620	20.322	28.646	1266.0	173.60	8.4384
275	0.087364	11.446	9353.2	178.29	20.322	28.646	1266.0	174.54	8.4169
280	0.08580	11.6540	7404.7	100.140	20.372	28.696	1277.0	176.08	8.5430
280	0.085805	11.654	9496.6	178.80	20.372	28.696	1277.0	177.05	8.5225
285	0.08430	11.8620	7548.3	100.650	20.418	28.741	1287.9	178.57	8.6470
285	0.084300	11.862	9640.2	179.31	20.418	28.741	1287.9	179.53	8.6275
290	0.08285	12.0700	7692.1	101.150	20.460	28.783	1298.7	181.06	8.7505
290	0.082848	12.070	9784.0	179.81	20.460	28.783	1298.7	181.99	8.7319
295	0.08144	12.2780	7836.1	101.640	20.500	28.822	1309.5	183.46	8.8533
295	0.081444	12.278	9928.0	180.30	20.500	28.822	1309.5	184.42	8.8357
300	0.08009	12.4860	7980.3	102.120	20.536	28.858	1320.2	185.85	8.9555
300	0.080088	12.486	10072	180.79	20.536	28.858	1320.2	186.83	8.9390
305	0.07878	12.6940	8124.7	102.600	20.570	28.892	1330.8	188.25	9.0571
305	0.078776	12.694	10217	181.27	20.570	28.892	1330.8	189.22	9.0418
310	0.07751	12.9020	8269.2	103.070	20.601	28.922	1341.3	190.65	9.1582
310	0.077506	12.902	10361	181.74	20.601	28.922	1341.3	191.58	9.1440
315	0.07628	13.1100	8413.9	103.530	20.630	28.951	1351.8	192.95	9.2588
315	0.076277	13.110	10506	182.20	20.630	28.951	1351.8	193.93	9.2458
320	0.07509	13.3180	8558.7	103.990	20.656	28.977	1362.2	195.26	9.3588
320	0.075086	13.318	10651	182.66	20.656	28.977	1362.2	196.25	9.3470
325	0.07393	13.5260	8703.6	104.440	20.680	29.001	1372.6	197.81	9.4583
325	0.073932	13.526	10796	183.10	20.680	29.001	1372.6	198.56	9.4478

TABLE 1 *Continued*

T (K)	ρ (mol·L^{-1})	V (L^{-1}·mol)	H (J·mol^{-1})	S (J·mol^{-1}·K^{-1})	C_v (J·mol^{-1}·K^{-1})	C_p (J·mol^{-1}·K^{-1})	c (m·s^{-1})	λ (mW·m^{-1}·K^{-1})	η (μPa·s)
~~330~~	~~0.07281~~	~~13.7340~~	~~8848.7~~	~~104.880~~	~~20.703~~	~~29.023~~	~~1382.9~~	~~200.36~~	~~9.5572~~
330	0.072812	13.734	10941	183.55	20.703	29.023	1382.9	200.84	9.5481
~~335~~	~~0.07173~~	~~13.9420~~	~~8993.9~~	~~105.320~~	~~20.723~~	~~29.043~~	~~1393.1~~	~~202.87~~	~~9.6557~~
335	0.071726	13.942	11086	183.98	20.723	29.043	1393.1	203.11	9.6480
~~340~~	~~0.07067~~	~~14.1500~~	~~9139.1~~	~~105.750~~	~~20.742~~	~~29.062~~	~~1403.2~~	~~205.38~~	~~9.7537~~
340	0.070672	14.150	11231	184.41	20.742	29.062	1403.2	205.36	9.7474
~~345~~	~~0.06965~~	~~14.3580~~	~~9284.5~~	~~106.170~~	~~20.759~~	~~29.079~~	~~1413.3~~	~~207.89~~	~~9.8511~~
345	0.069649	14.358	11376	184.84	20.759	29.079	1413.3	207.59	9.8464
~~350~~	~~0.06866~~	~~14.5660~~	~~9429.9~~	~~106.590~~	~~20.775~~	~~29.094~~	~~1423.4~~	~~210.40~~	~~9.9481~~
350	0.068655	14.566	11522	185.26	20.775	29.094	1423.3	209.81	9.9449
~~355~~	~~0.06769~~	~~14.7740~~	~~9575.4~~	~~107.000~~	~~20.789~~	~~29.108~~	~~1433.3~~	~~212.87~~	~~10.0450~~
355	0.067688	14.774	11667	185.67	20.789	29.108	1433.3	212.01	10.043
~~360~~	~~0.06675~~	~~14.9820~~	~~9721.0~~	~~107.410~~	~~20.802~~	~~29.121~~	~~1443.2~~	~~215.34~~	~~10.1410~~
360	0.066749	14.982	11813	186.08	20.802	29.121	1443.2	214.20	10.141
~~365~~	~~0.06584~~	~~15.1890~~	~~9866.6~~	~~107.810~~	~~20.814~~	~~29.133~~	~~1453.1~~	~~217.65~~	~~10.2360~~
365	0.065835	15.189	11959	186.48	20.814	29.133	1453.1	216.37	10.238
~~370~~	~~0.06495~~	~~15.3970~~	~~10012.0~~	~~108.210~~	~~20.825~~	~~29.144~~	~~1462.9~~	~~219.97~~	~~10.3310~~
370	0.064946	15.397	12104	186.88	20.825	29.144	1462.9	218.53	10.335
~~375~~	~~0.06408~~	~~15.6050~~	~~10158.0~~	~~108.600~~	~~20.835~~	~~29.154~~	~~1472.6~~	~~222.40~~	~~10.4260~~
375	0.064081	15.605	12250	187.27	20.835	29.154	1472.6	220.67	10.432
~~380~~	~~0.06324~~	~~15.8130~~	~~10304.0~~	~~108.990~~	~~20.845~~	~~29.163~~	~~1482.3~~	~~224.82~~	~~10.5210~~
380	0.063238	15.813	12396	187.65	20.845	29.163	1482.3	222.80	10.528
~~385~~	~~0.06242~~	~~16.0210~~	~~10450.0~~	~~109.370~~	~~20.853~~	~~29.171~~	~~1491.9~~	~~227.14~~	~~10.6140~~
385	0.062418	16.021	12542	188.03	20.853	29.171	1491.9	224.92	10.623
~~390~~	~~0.06162~~	~~16.2290~~	~~10596.0~~	~~109.740~~	~~20.861~~	~~29.178~~	~~1501.4~~	~~229.47~~	~~10.7080~~
390	0.061618	16.229	12688	188.41	20.861	29.178	1501.4	227.03	10.719
~~395~~	~~0.06084~~	~~16.4370~~	~~10741.0~~	~~110.120~~	~~20.868~~	~~29.185~~	~~1510.9~~	~~231.80~~	~~10.8010~~
395	0.060839	16.437	12833	188.78	20.867	29.185	1510.9	229.12	10.814
~~400~~	~~0.06008~~	~~16.6450~~	~~10887.0~~	~~110.480~~	~~20.874~~	~~29.191~~	~~1520.4~~	~~234.13~~	~~10.8940~~
400	0.060079	16.645	12979	189.15	20.874	29.191	1520.4	231.21	10.909
~~405~~	~~0.05934~~	~~16.8530~~	~~11033.0~~	~~110.850~~	~~20.880~~	~~29.197~~	~~1529.8~~	~~236.21~~	~~10.9860~~
405	0.059338	16.853	13125	189.51	20.880	29.197	1529.8	233.28	11.003
~~410~~	~~0.05862~~	~~17.0610~~	~~11179.0~~	~~111.200~~	~~20.885~~	~~29.202~~	~~1539.1~~	~~238.29~~	~~11.0780~~
410	0.058615	17.061	13271	189.87	20.885	29.202	1539.1	235.34	11.097
~~415~~	~~0.05791~~	~~17.2680~~	~~11325.0~~	~~111.560~~	~~20.890~~	~~29.207~~	~~1548.4~~	~~240.63~~	~~11.1690~~
415	0.057909	17.268	13417	190.22	20.890	29.207	1548.4	237.40	11.191
~~420~~	~~0.05722~~	~~17.4760~~	~~11471.0~~	~~111.910~~	~~20.894~~	~~29.212~~	~~1557.6~~	~~242.97~~	~~11.2600~~
420	0.057220	17.476	13563	190.57	20.894	29.211	1557.6	239.44	11.284
~~425~~	~~0.05655~~	~~17.6840~~	~~11618.0~~	~~112.250~~	~~20.899~~	~~29.216~~	~~1566.8~~	~~245.30~~	~~11.3510~~
425	0.056547	17.684	13709	190.92	20.899	29.216	1566.8	241.48	11.377
~~430~~	~~0.05589~~	~~17.8920~~	~~11764.0~~	~~112.600~~	~~20.902~~	~~29.219~~	~~1576.0~~	~~247.64~~	~~11.4420~~
430	0.055890	17.892	13856	191.26	20.902	29.219	1576.0	243.50	11.470
~~435~~	~~0.05525~~	~~18.1000~~	~~11910.0~~	~~112.930~~	~~20.906~~	~~29.223~~	~~1585.0~~	~~249.98~~	~~11.5320~~
435	0.055248	18.100	14002	191.60	20.906	29.223	1585.0	245.52	11.562
~~440~~	~~0.05462~~	~~18.3080~~	~~12056.0~~	~~113.270~~	~~20.909~~	~~29.226~~	~~1594.1~~	~~252.33~~	~~11.6210~~
440	0.054621	18.308	14148	191.93	20.909	29.226	1594.1	247.53	11.655
~~445~~	~~0.05401~~	~~18.5160~~	~~12202.0~~	~~113.600~~	~~20.913~~	~~29.229~~	~~1603.1~~	~~254.67~~	~~11.7110~~
445	0.054008	18.516	14294	192.26	20.913	29.229	1603.1	249.53	11.746
~~450~~	~~0.05341~~	~~18.7240~~	~~12348.0~~	~~113.920~~	~~20.916~~	~~29.232~~	~~1612.0~~	~~257.02~~	~~11.8000~~
450	0.053408	18.724	14440	192.59	20.916	29.232	1612.0	251.53	11.838
~~455~~	~~0.05282~~	~~18.9320~~	~~12494.0~~	~~114.250~~	~~20.919~~	~~29.235~~	~~1620.9~~	~~259.37~~	~~11.8890~~
455	0.052822	18.932	14586	192.91	20.919	29.235	1620.9	253.52	11.929
~~460~~	~~0.05225~~	~~19.1400~~	~~12640.0~~	~~114.570~~	~~20.921~~	~~29.238~~	~~1629.7~~	~~261.71~~	~~11.9770~~
460	0.052248	19.139	14732	193.23	20.921	29.238	1629.7	255.50	12.020
~~465~~	~~0.05169~~	~~19.3470~~	~~12787.0~~	~~114.880~~	~~20.924~~	~~29.240~~	~~1638.5~~	~~264.07~~	~~12.0650~~
465	0.051687	19.347	14879	193.55	20.924	29.240	1638.5	257.47	12.111
~~470~~	~~0.05114~~	~~19.5550~~	~~12933.0~~	~~115.200~~	~~20.927~~	~~29.243~~	~~1647.2~~	~~266.42~~	~~12.1530~~
470	0.051137	19.555	15025	193.86	20.927	29.243	1647.2	259.44	12.201
~~475~~	~~0.05060~~	~~19.7630~~	~~13079.0~~	~~115.510~~	~~20.929~~	~~29.245~~	~~1655.9~~	~~268.77~~	~~12.2400~~
475	0.050599	19.763	15171	194.17	20.929	29.245	1655.9	261.40	12.291
~~480~~	~~0.05007~~	~~19.9710~~	~~13225.0~~	~~115.810~~	~~20.932~~	~~29.248~~	~~1664.6~~	~~271.13~~	~~12.3270~~
480	0.050073	19.971	15317	194.48	20.932	29.248	1664.6	263.36	12.381
~~485~~	~~0.04956~~	~~20.1790~~	~~13372.0~~	~~116.110~~	~~20.934~~	~~29.250~~	~~1673.2~~	~~273.49~~	~~12.4140~~
485	0.049557	20.179	15464	194.78	20.934	29.250	1673.2	265.31	12.471
~~490~~	~~0.04905~~	~~20.3870~~	~~13518.0~~	~~116.410~~	~~20.937~~	~~29.253~~	~~1681.7~~	~~275.84~~	~~12.5010~~
490	0.049051	20.387	15610	195.08	20.937	29.253	1681.7	267.26	12.560
~~495~~	~~0.04856~~	~~20.5950~~	~~13664.0~~	~~116.710~~	~~20.940~~	~~29.255~~	~~1690.2~~	~~278.20~~	~~12.5870~~
495	0.048556	20.595	15756	195.38	20.940	29.255	1690.2	269.20	12.649
~~500~~	~~0.04807~~	~~20.8030~~	~~13810.0~~	~~117.010~~	~~20.942~~	~~29.258~~	~~1698.7~~	~~280.57~~	~~12.6730~~
500	0.048071	20.803	15902	195.67	20.942	29.258	1698.7	271.13	12.738
				0.5 MPa					
~~50~~	~~1.25300~~	~~0.7981~~	~~1508.6~~	~~50.290~~	~~12.677~~	~~22.483~~	~~580.4~~	~~39.86~~	~~2.5283~~
50	1.2530	0.79809	3600.5	128.96	12.677	22.483	580.37	40.125	2.4560
~~55~~	~~1.12660~~	~~0.8876~~	~~1620.1~~	~~52.417~~	~~12.685~~	~~22.169~~	~~611.0~~	~~42.82~~	~~2.7243~~

TABLE 1 *Continued*

T (K)	ρ (mol·L^{-1})	V (L^{-1}·mol)	H (J·mol^{-1})	S (J·mol^{-1}·K^{-1})	C_v (J·mol^{-1}·K^{-1})	C_p (J·mol^{-1}·K^{-1})	c (m·s^{-1})	λ (mW·m^{-1}·K^{-1})	η (μPa·s)
55	1.1266	0.88761	3712.1	131.08	12.685	22.168	611.04	43.047	2.6478
60	1.02480	0.9758	1730.5	54.337	12.729	21.985	639.5	45.78	2.9126
60	1.0248	0.97584	3822.4	133.00	12.729	21.985	639.47	45.952	2.8328
65	0.94060	1.0632	1840.1	56.093	12.811	21.901	666.0	48.75	3.0938
65	0.94060	1.0632	3932.1	134.76	12.811	21.901	665.95	48.846	3.0117
70	0.86974	1.1498	1949.6	57.715	12.931	21.895	690.7	51.76	3.2687
70	0.86974	1.1498	4041.6	136.38	12.931	21.895	690.69	51.738	3.1854
75	0.80916	1.2358	2059.2	59.228	13.088	21.955	713.9	54.59	3.4379
75	0.80916	1.2358	4151.2	137.89	13.088	21.955	713.88	54.640	3.3544
80	0.75671	1.3215	2169.2	60.648	13.279	22.069	735.7	57.48	3.6021
80	0.75671	1.3215	4261.2	139.31	13.279	22.069	735.67	57.562	3.5191
85	0.71082	1.4068	2280.0	61.990	13.500	22.227	756.2	60.43	3.7618
85	0.71082	1.4068	4371.9	140.66	13.500	22.227	756.24	60.513	3.6800
90	0.67030	1.4919	2391.6	63.266	13.746	22.422	775.7	63.21	3.9175
90	0.67030	1.4919	4483.5	141.93	13.746	22.422	775.73	63.500	3.8373
95	0.63424	1.5767	2504.2	64.484	14.012	22.645	794.3	66.23	4.0696
95	0.63424	1.5767	4596.2	143.15	14.012	22.645	794.29	66.528	3.9914
100	0.60193	1.6613	2618.1	65.652	14.292	22.890	812.0	69.26	4.2185
100	0.60193	1.6613	4710.0	144.32	14.292	22.890	812.04	69.600	4.1425
105	0.57281	1.7458	2733.2	66.775	14.581	23.149	829.1	72.53	4.3643
105	0.57281	1.7458	4825.1	145.44	14.581	23.149	829.11	72.716	4.2908
110	0.54641	1.8301	2849.6	67.858	14.876	23.418	845.6	75.81	4.5075
110	0.54641	1.8301	4941.5	146.52	14.876	23.418	845.59	75.874	4.4366
115	0.52237	1.9143	2967.3	68.905	15.172	23.692	861.6	79.02	4.6483
115	0.52237	1.9143	5059.3	147.57	15.172	23.692	861.57	79.070	4.5799
120	0.50039	1.9985	3086.5	69.919	15.466	23.967	877.1	82.25	4.7869
120	0.50039	1.9985	5178.5	148.59	15.466	23.967	877.12	82.300	4.7209
125	0.48020	2.0825	3207.0	70.903	15.757	24.241	892.3	85.52	4.9234
125	0.48020	2.0825	5299.0	149.57	15.757	24.241	892.29	85.557	4.8599
130	0.46159	2.1664	3328.9	71.859	16.040	24.510	907.1	88.81	5.0580
130	0.46159	2.1664	5420.9	150.53	16.040	24.510	907.13	88.835	4.9968
135	0.44438	2.2503	3452.1	72.789	16.317	24.773	921.7	92.04	5.1909
135	0.44438	2.2503	5544.1	151.46	16.317	24.773	921.69	92.127	5.1319
140	0.42842	2.3341	3576.6	73.695	16.584	25.029	936.0	95.29	5.3220
140	0.42843	2.3341	5668.6	152.36	16.584	25.029	936.00	95.426	5.2652
145	0.41358	2.4179	3702.4	74.577	16.841	25.276	950.1	98.44	5.4517
145	0.41358	2.4179	5794.3	153.24	16.841	25.276	950.07	98.725	5.3969
150	0.39974	2.5016	3829.4	75.438	17.087	25.513	963.9	101.59	5.5798
150	0.39974	2.5016	5921.3	154.10	17.087	25.513	963.94	102.02	5.5269
155	0.38680	2.5853	3957.5	76.279	17.323	25.741	977.6	104.84	5.7065
155	0.38680	2.5853	6049.5	154.95	17.323	25.741	977.62	105.30	5.6554
160	0.37468	2.6689	4086.7	77.099	17.548	25.958	991.1	108.10	5.8320
160	0.37468	2.6689	6178.7	155.77	17.548	25.958	991.12	108.57	5.7825
165	0.36330	2.7525	4217.1	77.901	17.763	26.166	1004.5	111.32	5.9561
165	0.36330	2.7525	6309.0	156.57	17.763	26.166	1004.5	111.81	5.9082
170	0.35260	2.8361	4348.4	78.685	17.966	26.363	1017.7	114.53	6.0791
170	0.35260	2.8361	6440.3	157.35	17.966	26.363	1017.7	115.03	6.0326
175	0.34251	2.9197	4480.7	79.452	18.159	26.551	1030.7	117.66	6.2009
175	0.34251	2.9197	6572.6	158.12	18.159	26.551	1030.7	118.23	6.1557
180	0.33298	3.0032	4613.9	80.203	18.342	26.728	1043.6	120.78	6.3216
180	0.33298	3.0032	6705.8	158.87	18.341	26.728	1043.6	121.39	6.2777
185	0.32397	3.0867	4747.9	80.937	18.514	26.896	1056.4	123.86	6.4412
185	0.32397	3.0867	6839.9	159.60	18.514	26.896	1056.4	124.52	6.3985
190	0.31544	3.1701	4882.8	81.657	18.677	27.055	1069.0	126.94	6.5598
190	0.31544	3.1701	6974.8	160.32	18.677	27.055	1069.0	127.62	6.5182
195	0.30735	3.2536	5018.5	82.362	18.831	27.205	1081.6	129.93	6.6774
195	0.30735	3.2536	7110.4	161.03	18.831	27.205	1081.6	130.68	6.6369
200	0.29967	3.3370	5154.9	83.052	18.976	27.346	1094.0	132.92	6.7941
200	0.29967	3.3370	7246.8	161.72	18.976	27.346	1094.0	133.71	6.7545
205	0.29236	3.4204	5291.9	83.729	19.112	27.480	1106.3	135.86	6.9098
205	0.29236	3.4204	7383.9	162.40	19.112	27.480	1106.3	136.70	6.8712
210	0.28540	3.5038	5429.7	84.393	19.241	27.605	1118.5	138.81	7.0247
210	0.28540	3.5038	7521.6	163.06	19.241	27.605	1118.5	139.65	6.9869
215	0.27877	3.5872	5568.0	85.044	19.361	27.723	1130.6	141.66	7.1387
215	0.27877	3.5872	7659.9	163.71	19.361	27.723	1130.6	142.57	7.1017
220	0.27244	3.6706	5706.9	85.682	19.475	27.833	1142.6	144.51	7.2518
220	0.27244	3.6706	7798.8	164.35	19.475	27.833	1142.6	145.45	7.2157
225	0.26639	3.7539	5846.3	86.309	19.581	27.937	1154.5	147.32	7.3641
225	0.26639	3.7539	7938.2	164.98	19.581	27.937	1154.5	148.30	7.3288
230	0.26060	3.8373	5986.2	86.924	19.680	28.034	1166.3	150.13	7.4756
230	0.26060	3.8373	8078.2	165.59	19.680	28.034	1166.3	151.11	7.4411
235	0.25506	3.9206	6126.6	87.528	19.773	28.125	1178.0	152.89	7.5863
235	0.25506	3.9206	8218.6	166.19	19.773	28.125	1178.0	153.89	7.5526
240	0.24975	4.0040	6267.5	88.121	19.861	28.211	1189.6	155.65	7.6963

TABLE 1 *Continued*

T (K)	ρ (mol·L^{-1})	V (L^{-1}·mol)	H (J·mol^{-1})	S (J·mol^{-1}·K^{-1})	C_v (J·mol^{-1}·K^{-1})	C_p (J·mol^{-1}·K^{-1})	c (m·s^{-1})	λ (mW·m^{-1}·K^{-1})	η (μPa·s)
240	0.24975	4.0040	8359.4	166.79	19.861	28.210	1189.6	156.63	7.6634
245	0.24466	4.0873	6408.7	88.704	19.942	28.290	1201.2	158.32	7.8055
245	0.24466	4.0873	8500.7	167.37	19.942	28.290	1201.2	159.34	7.7734
250	0.23977	4.1706	6550.4	89.276	20.018	28.364	1212.6	160.99	7.9140
250	0.23978	4.1706	8642.3	167.94	20.018	28.364	1212.6	162.02	7.8827
255	0.23508	4.2539	6692.4	89.838	20.089	28.434	1224.0	163.61	8.0218
255	0.23508	4.2539	8784.3	168.50	20.089	28.434	1224.0	164.67	7.9913
260	0.23056	4.3372	6834.7	90.391	20.155	28.499	1235.3	166.23	8.1289
260	0.23057	4.3372	8926.6	169.06	20.155	28.498	1235.3	167.28	8.0992
265	0.22622	4.4205	6977.3	90.934	20.217	28.559	1246.5	168.81	8.2353
265	0.22622	4.4205	9069.3	169.60	20.217	28.559	1246.5	169.87	8.2065
270	0.22204	4.5037	7120.3	91.469	20.274	28.615	1257.6	171.39	8.3411
270	0.22204	4.5037	9212.2	170.14	20.274	28.615	1257.6	172.43	8.3132
275	0.21801	4.5870	7263.5	91.994	20.328	28.667	1268.6	173.87	8.4462
275	0.21801	4.5870	9355.4	170.66	20.328	28.667	1268.6	174.96	8.4192
280	0.21412	4.6703	7406.9	92.511	20.377	28.715	1279.6	176.35	8.5507
280	0.21412	4.6703	9498.9	171.18	20.377	28.715	1279.6	177.46	8.5246
285	0.21037	4.7535	7550.6	93.020	20.423	28.760	1290.5	178.84	8.6546
285	0.21037	4.7535	9642.6	171.69	20.423	28.760	1290.5	179.94	8.6295
290	0.20675	4.8368	7694.5	93.520	20.465	28.801	1301.3	181.33	8.7579
290	0.20675	4.8368	9786.5	172.19	20.465	28.801	1301.3	182.39	8.7338
295	0.20325	4.9200	7838.6	94.013	20.505	28.840	1312.0	183.72	8.8606
295	0.20325	4.9200	9930.6	172.68	20.505	28.839	1312.0	184.82	8.8375
300	0.19987	5.0033	7982.9	94.498	20.541	28.875	1322.7	186.11	8.9627
300	0.19987	5.0033	10075	173.16	20.541	28.875	1322.7	187.23	8.9407
305	0.19660	5.0865	8127.4	94.976	20.575	28.908	1333.3	188.50	9.0642
305	0.19660	5.0865	10219	173.64	20.575	28.908	1333.3	189.61	9.0434
310	0.19343	5.1697	8272.0	95.446	20.606	28.938	1343.8	190.90	9.1652
310	0.19343	5.1697	10364	174.11	20.606	28.938	1343.8	191.97	9.1456
315	0.19037	5.2530	8416.7	95.909	20.634	28.966	1354.3	193.20	9.2656
315	0.19037	5.2530	10509	174.58	20.634	28.966	1354.3	194.31	9.2472
320	0.18740	5.3362	8561.6	96.366	20.661	28.991	1364.7	195.50	9.3655
320	0.18740	5.3362	10654	175.03	20.661	28.991	1364.7	196.63	9.3484
325	0.18452	5.4194	8706.7	96.815	20.685	29.015	1375.0	198.05	9.4649
325	0.18452	5.4194	10799	175.48	20.685	29.015	1375.0	198.93	9.4491
330	0.18173	5.5026	8851.8	97.258	20.707	29.036	1385.3	200.60	9.5638
330	0.18173	5.5026	10944	175.92	20.707	29.036	1385.3	201.21	9.5494
335	0.17902	5.5859	8997.0	97.695	20.727	29.056	1395.5	203.10	9.6621
335	0.17902	5.5859	11089	176.36	20.727	29.056	1395.5	203.48	9.6491
340	0.17640	5.6691	9142.3	98.126	20.746	29.074	1405.6	205.61	9.7600
340	0.17640	5.6691	11234	176.79	20.746	29.074	1405.6	205.72	9.7485
345	0.17384	5.7523	9287.8	98.550	20.763	29.091	1415.7	208.12	9.8574
345	0.17384	5.7523	11380	177.22	20.763	29.091	1415.7	207.95	9.8474
350	0.17137	5.8355	9433.2	98.969	20.779	29.106	1425.7	210.63	9.9543
350	0.17137	5.8355	11525	177.64	20.779	29.106	1425.7	210.17	9.9459
355	0.16896	5.9187	9578.8	99.382	20.793	29.120	1435.7	213.09	10.0510
355	0.16896	5.9187	11671	178.05	20.793	29.120	1435.7	212.36	10.044
360	0.16661	6.0019	9724.4	99.789	20.807	29.132	1445.6	215.56	10.1470
360	0.16661	6.0019	11816	178.46	20.806	29.132	1445.6	214.55	10.142
365	0.16434	6.0851	9870.1	100.190	20.819	29.144	1455.4	217.87	10.2420
365	0.16434	6.0851	11962	178.86	20.818	29.144	1455.4	216.72	10.239
370	0.16212	6.1683	10016.0	100.590	20.829	29.154	1465.2	220.19	10.3370
370	0.16212	6.1683	12108	179.25	20.829	29.154	1465.2	218.87	10.336
375	0.15996	6.2515	10162.0	100.980	20.839	29.164	1474.9	222.61	10.4320
375	0.15996	6.2515	12254	179.65	20.839	29.164	1474.9	221.01	10.432
380	0.15786	6.3347	10308.0	101.370	20.848	29.172	1484.6	225.03	10.5260
380	0.15786	6.3347	12399	180.03	20.848	29.172	1484.6	223.14	10.528
385	0.15581	6.4179	10453.0	101.750	20.857	29.180	1494.2	227.35	10.6200
385	0.15582	6.4179	12545	180.41	20.857	29.180	1494.2	225.26	10.624
390	0.15382	6.5011	10599.0	102.120	20.864	29.187	1503.7	229.68	10.7130
390	0.15382	6.5011	12691	180.79	20.864	29.187	1503.7	227.36	10.719
395	0.15188	6.5842	10745.0	102.500	20.871	29.194	1513.2	232.00	10.8060
395	0.15188	6.5842	12837	181.16	20.871	29.194	1513.2	229.45	10.814
400	0.14998	6.6674	10891.0	102.860	20.878	29.200	1522.6	234.33	10.8990
400	0.14998	6.6674	12983	181.53	20.878	29.200	1522.6	231.54	10.909
405	0.14813	6.7506	11037.0	103.230	20.883	29.205	1532.0	236.41	10.9910
405	0.14813	6.7506	13129	181.89	20.883	29.205	1532.0	233.61	11.003
410	0.14633	6.8338	11183.0	103.580	20.889	29.210	1541.4	238.49	11.0830
410	0.14633	6.8338	13275	182.25	20.889	29.210	1541.4	235.67	11.097
415	0.14457	6.9170	11329.0	103.940	20.893	29.215	1550.6	240.83	11.1740
415	0.14457	6.9170	13421	182.60	20.893	29.215	1550.6	237.72	11.191
420	0.14285	7.0002	11475.0	104.290	20.898	29.219	1559.9	243.16	11.2660
420	0.14285	7.0001	13567	182.95	20.898	29.219	1559.9	239.76	11.284
425	0.14118	7.0833	11622.0	104.630	20.902	29.223	1569.0	245.50	11.3560

TABLE 1 *Continued*

T (K)	ρ (mol·L^{-1})	V (L^{-1}·mol)	H (J·mol^{-1})	S (J·mol^{-1}·K^{-1})	C_v (J·mol^{-1}·K^{-1})	C_p (J·mol^{-1}·K^{-1})	c (m·s^{-1})	λ (mW·m^{-1}·K^{-1})	η (μPa·s)
425	0.14118	7.0833	13713	183.30	20.902	29.223	1569.0	241.79	11.377
430	0.13954	7.1665	11768.0	104.980	20.906	29.226	1578.1	247.84	11.4470
430	0.13954	7.1665	13860	183.64	20.906	29.226	1578.1	243.82	11.470
435	0.13794	7.2497	11914.0	105.310	20.909	29.230	1587.2	250.18	11.5370
435	0.13794	7.2497	14006	183.98	20.909	29.230	1587.2	245.83	11.563
440	0.13637	7.3329	12060.0	105.650	20.913	29.233	1596.2	252.52	11.6260
440	0.13637	7.3328	14152	184.31	20.913	29.233	1596.2	247.84	11.655
445	0.13484	7.4160	12206.0	105.980	20.916	29.236	1605.2	254.86	11.7160
445	0.13484	7.4160	14298	184.64	20.916	29.236	1605.2	249.84	11.746
450	0.13335	7.4992	12352.0	106.300	20.919	29.238	1614.1	257.20	11.8050
450	0.13335	7.4992	14444	184.97	20.919	29.238	1614.1	251.84	11.838
455	0.13188	7.5824	12499.0	106.630	20.922	29.241	1623.0	259.55	11.8930
455	0.13189	7.5824	14590	185.29	20.922	29.241	1623.0	253.82	11.929
460	0.13045	7.6655	12645.0	106.950	20.925	29.244	1631.8	261.90	11.9820
460	0.13045	7.6655	14737	185.61	20.925	29.244	1631.8	255.80	12.020
465	0.12905	7.7487	12791.0	107.260	20.927	29.246	1640.6	264.25	12.0700
465	0.12905	7.7487	14883	185.93	20.927	29.246	1640.6	257.77	12.111
470	0.12768	7.8319	12937.0	107.580	20.930	29.248	1649.3	266.60	12.1570
470	0.12768	7.8319	15029	186.24	20.930	29.248	1649.3	259.74	12.201
475	0.12634	7.9150	13083.0	107.890	20.932	29.251	1658.0	268.95	12.2450
475	0.12634	7.9150	15175	186.55	20.932	29.251	1658.0	261.70	12.291
480	0.12503	7.9982	13230.0	108.190	20.935	29.253	1666.6	271.31	12.3320
480	0.12503	7.9982	15322	186.86	20.935	29.253	1666.6	263.66	12.381
485	0.12374	8.0814	13376.0	108.500	20.938	29.256	1675.2	273.66	12.4190
485	0.12374	8.0813	15468	187.16	20.938	29.256	1675.2	265.60	12.471
490	0.12248	8.1645	13522.0	108.800	20.940	29.258	1683.8	276.02	12.5050
490	0.12248	8.1645	15614	187.46	20.940	29.258	1683.8	267.55	12.560
495	0.12125	8.2477	13669.0	109.090	20.943	29.260	1692.3	278.38	12.5910
495	0.12125	8.2477	15760	187.76	20.943	29.260	1692.3	269.49	12.649
500	0.12004	8.3308	13815.0	109.390	20.945	29.263	1700.7	280.74	12.6770
500	0.12004	8.3308	15907	188.05	20.945	29.263	1700.7	271.42	12.738
				1.0 MPa					
50	2.61740	0.3821	1454.7	43.785	12.837	24.482	576.1	42.10	2.6078
50	2.6174	0.38206	3546.7	122.45	12.837	24.482	576.10	43.028	2.5365
55	2.32380	0.4303	1574.9	46.076	12.810	23.649	609.2	44.74	2.7944
55	2.3238	0.43034	3666.8	124.74	12.810	23.649	609.15	45.633	2.7187
60	2.09580	0.4772	1691.7	48.110	12.830	23.135	639.3	47.46	2.9756
60	2.0958	0.47715	3783.7	126.78	12.830	23.135	639.26	48.298	2.8958
65	1.91220	0.5230	1806.6	49.949	12.895	22.823	667.0	50.26	3.1512
65	1.9122	0.52296	3898.5	128.62	12.895	22.823	666.97	51.002	3.0684
70	1.76050	0.5680	1920.2	51.633	13.002	22.654	692.6	53.12	3.3215
70	1.7605	0.56803	4012.2	130.30	13.002	22.654	692.63	53.740	3.2366
75	1.63250	0.6126	2033.3	53.193	13.149	22.591	716.5	55.91	3.4869
75	1.6325	0.61255	4125.3	131.86	13.149	22.591	716.50	56.512	3.4009
80	1.52290	0.6566	2146.3	54.652	13.332	22.611	738.8	58.79	3.6479
80	1.5229	0.65663	4238.2	133.32	13.332	22.611	738.82	59.323	3.5616
85	1.42780	0.7004	2259.5	56.025	13.547	22.695	759.8	61.80	3.8048
85	1.4278	0.70036	4351.5	134.69	13.547	22.695	759.79	62.178	3.7189
90	1.34440	0.7438	2373.3	57.326	13.788	22.830	779.6	64.51	3.9581
90	1.3444	0.74382	4465.3	135.99	13.788	22.830	779.59	65.082	3.8730
95	1.27060	0.7871	2487.9	58.564	14.049	23.005	798.4	67.46	4.1080
95	1.2706	0.78705	4579.8	137.23	14.049	23.005	798.39	68.036	4.0243
100	1.20470	0.8301	2603.4	59.750	14.326	23.208	816.3	70.41	4.2550
100	1.2047	0.83010	4695.4	138.42	14.326	23.208	816.34	71.042	4.1730
105	1.14550	0.8730	2720.0	60.887	14.612	23.434	833.6	73.62	4.3990
105	1.1455	0.87298	4812.0	139.55	14.612	23.434	833.55	74.099	4.3190
110	1.09200	0.9157	2837.8	61.983	14.905	23.674	850.2	76.84	4.5405
110	1.0920	0.91572	4929.7	140.65	14.904	23.674	850.15	77.204	4.4628
115	1.04350	0.9584	2956.8	63.041	15.199	23.923	866.2	80.01	4.6798
115	1.0435	0.95835	5048.7	141.71	15.199	23.923	866.21	80.351	4.6043
120	0.99912	1.0009	3077.0	64.064	15.491	24.178	881.8	83.19	4.8170
120	0.99912	1.0009	5169.0	142.73	15.491	24.178	881.82	83.537	4.7437
125	0.95847	1.0433	3198.5	65.056	15.780	24.433	897.1	86.43	4.9523
125	0.95847	1.0433	5290.5	143.72	15.780	24.433	897.05	86.753	4.8812
130	0.92107	1.0857	3321.3	66.020	16.063	24.686	911.9	89.68	5.0857
130	0.92107	1.0857	5413.3	144.69	16.063	24.686	911.93	89.994	5.0167
135	0.88653	1.1280	3445.4	66.956	16.337	24.935	926.5	92.89	5.2175
135	0.88653	1.1280	5537.3	145.62	16.337	24.935	926.52	93.251	5.1506
140	0.85453	1.1702	3570.7	67.867	16.603	25.178	940.8	96.10	5.3477
140	0.85453	1.1702	5662.6	146.53	16.603	25.178	940.84	96.518	5.2827
145	0.82480	1.2124	3697.1	68.755	16.860	25.413	954.9	99.22	5.4764
145	0.82480	1.2124	5789.1	147.42	16.860	25.413	954.93	99.787	5.4133
150	0.79709	1.2546	3824.8	69.620	17.105	25.641	968.8	102.35	5.6037
150	0.79709	1.2546	5916.7	148.29	17.105	25.641	968.80	103.05	5.5424

TABLE 1 *Continued*

T (K)	ρ (mol·L^{-1})	V (L^{-1}·mol)	H (J·mol^{-1})	S (J·mol^{-1}·K^{-1})	C_v (J·mol^{-1}·K^{-1})	C_p (J·mol^{-1}·K^{-1})	c (m·s^{-1})	λ (mW·m^{-1}·K^{-1})	η (μPa·s)
~~155~~	~~0.77121~~	~~1.2967~~	~~3953.5~~	~~70.465~~	~~17.341~~	~~25.860~~	~~982.5~~	~~105.58~~	~~5.7297~~
155	0.77122	1.2967	6045.5	149.13	17.341	25.860	982.48	106.31	5.6700
~~160~~	~~0.74699~~	~~1.3387~~	~~4083.4~~	~~71.289~~	~~17.565~~	~~26.069~~	~~996.0~~	~~108.82~~	~~5.8544~~
160	0.74699	1.3387	6175.3	149.96	17.565	26.069	995.98	109.55	5.7962
~~165~~	~~0.72425~~	~~1.3807~~	~~4214.2~~	~~72.094~~	~~17.778~~	~~26.269~~	~~1009.3~~	~~112.01~~	~~5.9778~~
165	0.72425	1.3807	6306.2	150.76	17.778	26.269	1009.3	112.77	5.9212
~~170~~	~~0.70287~~	~~1.4227~~	~~4346.0~~	~~72.881~~	~~17.981~~	~~26.460~~	~~1022.5~~	~~115.21~~	~~6.1002~~
170	0.70287	1.4227	6438.0	151.55	17.981	26.460	1022.5	115.97	6.0448
~~175~~	~~0.68273~~	~~1.4647~~	~~4478.8~~	~~73.651~~	~~18.174~~	~~26.642~~	~~1035.5~~	~~118.31~~	~~6.2214~~
175	0.68274	1.4647	6570.8	152.32	18.174	26.642	1035.5	119.15	6.1673
~~180~~	~~0.66373~~	~~1.5066~~	~~4612.4~~	~~74.404~~	~~18.356~~	~~26.814~~	~~1048.4~~	~~121.42~~	~~6.3415~~
180	0.66373	1.5066	6704.4	153.07	18.356	26.814	1048.4	122.29	6.2887
~~185~~	~~0.64576~~	~~1.5486~~	~~4746.9~~	~~75.141~~	~~18.528~~	~~26.977~~	~~1061.2~~	~~124.49~~	~~6.4606~~
185	0.64576	1.5486	6838.9	153.81	18.528	26.977	1061.2	125.40	6.4089
~~190~~	~~0.62875~~	~~1.5904~~	~~4882.2~~	~~75.862~~	~~18.691~~	~~27.131~~	~~1073.8~~	~~127.55~~	~~6.5787~~
190	0.62875	1.5904	6974.2	154.53	18.691	27.131	1073.8	128.48	6.5280
~~195~~	~~0.61262~~	~~1.6323~~	~~5018.2~~	~~76.569~~	~~18.844~~	~~27.277~~	~~1086.3~~	~~130.53~~	~~6.6958~~
195	0.61263	1.6323	7110.2	155.24	18.844	27.277	1086.3	131.53	6.6462
~~200~~	~~0.59731~~	~~1.6742~~	~~5155.0~~	~~77.261~~	~~18.989~~	~~27.414~~	~~1098.7~~	~~133.50~~	~~6.8120~~
200	0.59731	1.6742	7246.9	155.93	18.989	27.414	1098.7	134.54	6.7634
~~205~~	~~0.58274~~	~~1.7160~~	~~5292.4~~	~~77.940~~	~~19.125~~	~~27.544~~	~~1111.0~~	~~136.43~~	~~6.9273~~
205	0.58275	1.7160	7384.3	156.61	19.125	27.544	1111.0	137.52	6.8796
~~210~~	~~0.56888~~	~~1.7578~~	~~5430.4~~	~~78.605~~	~~19.253~~	~~27.666~~	~~1123.2~~	~~139.37~~	~~7.0417~~
210	0.56888	1.7578	7522.3	157.27	19.253	27.666	1123.2	140.46	6.9949
~~215~~	~~0.55566~~	~~1.7997~~	~~5569.0~~	~~79.257~~	~~19.373~~	~~27.780~~	~~1135.3~~	~~142.20~~	~~7.1553~~
215	0.55566	1.7996	7660.9	157.92	19.373	27.780	1135.3	143.36	7.1093
~~220~~	~~0.54305~~	~~1.8414~~	~~5708.2~~	~~79.897~~	~~19.486~~	~~27.888~~	~~1147.2~~	~~145.04~~	~~7.2680~~
220	0.54305	1.8414	7800.1	158.56	19.486	27.888	1147.2	146.23	7.2229
~~225~~	~~0.53100~~	~~1.8832~~	~~5847.9~~	~~80.525~~	~~19.592~~	~~27.989~~	~~1159.1~~	~~147.84~~	~~7.3800~~
225	0.53100	1.8832	7939.8	159.19	19.592	27.989	1159.1	149.07	7.3356
~~230~~	~~0.51948~~	~~1.9250~~	~~5988.1~~	~~81.141~~	~~19.691~~	~~28.084~~	~~1170.9~~	~~150.64~~	~~7.4911~~
230	0.51948	1.9250	8080.0	159.81	19.691	28.084	1170.9	151.87	7.4476
~~235~~	~~0.50845~~	~~1.9668~~	~~6128.7~~	~~81.746~~	~~19.784~~	~~28.173~~	~~1182.6~~	~~153.39~~	~~7.6015~~
235	0.50845	1.9668	8220.6	160.41	19.784	28.173	1182.6	154.63	7.5588
~~240~~	~~0.49788~~	~~2.0085~~	~~6269.8~~	~~82.340~~	~~19.871~~	~~28.256~~	~~1194.2~~	~~156.14~~	~~7.7112~~
240	0.49788	2.0085	8361.7	161.01	19.871	28.256	1194.2	157.36	7.6692
~~245~~	~~0.48774~~	~~2.0503~~	~~6411.2~~	~~82.924~~	~~19.952~~	~~28.333~~	~~1205.7~~	~~158.80~~	~~7.8201~~
245	0.48774	2.0503	8503.2	161.59	19.952	28.333	1205.7	160.06	7.7790
~~250~~	~~0.47801~~	~~2.0920~~	~~6553.1~~	~~83.497~~	~~20.028~~	~~28.406~~	~~1217.1~~	~~161.46~~	~~7.9283~~
250	0.47801	2.0920	8645.0	162.16	20.028	28.406	1217.1	162.73	7.8880
~~255~~	~~0.46867~~	~~2.1337~~	~~6695.3~~	~~84.060~~	~~20.099~~	~~28.473~~	~~1228.4~~	~~164.07~~	~~8.0358~~
255	0.46867	2.1337	8787.2	162.73	20.099	28.473	1228.4	165.37	7.9963
~~260~~	~~0.45968~~	~~2.1754~~	~~6837.8~~	~~84.614~~	~~20.165~~	~~28.536~~	~~1239.7~~	~~166.69~~	~~8.1426~~
260	0.45968	2.1754	8929.8	163.28	20.165	28.536	1239.7	167.98	8.1040
~~265~~	~~0.45103~~	~~2.2171~~	~~6980.7~~	~~85.158~~	~~20.226~~	~~28.595~~	~~1250.9~~	~~169.26~~	~~8.2488~~
265	0.45103	2.2171	9072.6	163.82	20.226	28.595	1250.9	170.55	8.2111
~~270~~	~~0.44270~~	~~2.2588~~	~~7123.8~~	~~85.693~~	~~20.283~~	~~28.649~~	~~1262.0~~	~~171.83~~	~~8.3543~~
270	0.44270	2.2588	9215.7	164.36	20.283	28.649	1262.0	173.10	8.3175
~~275~~	~~0.43468~~	~~2.3005~~	~~7267.1~~	~~86.219~~	~~20.337~~	~~28.700~~	~~1273.0~~	~~174.31~~	~~8.4592~~
275	0.43468	2.3005	9359.1	164.89	20.337	28.700	1273.0	175.63	8.4233
~~280~~	~~0.42694~~	~~2.3422~~	~~7410.8~~	~~86.736~~	~~20.386~~	~~28.747~~	~~1283.9~~	~~176.78~~	~~8.5635~~
280	0.42694	2.3422	9502.7	165.40	20.386	28.747	1283.9	178.12	8.5286
~~285~~	~~0.41948~~	~~2.3839~~	~~7554.6~~	~~87.246~~	~~20.432~~	~~28.790~~	~~1294.8~~	~~179.26~~	~~8.6671~~
285	0.41948	2.3839	9646.5	165.91	20.432	28.790	1294.8	180.59	8.6332
~~290~~	~~0.41227~~	~~2.4256~~	~~7698.7~~	~~87.747~~	~~20.474~~	~~28.831~~	~~1305.6~~	~~181.74~~	~~8.7702~~
290	0.41227	2.4256	9790.6	166.41	20.474	28.831	1305.6	183.04	8.7373
~~295~~	~~0.40531~~	~~2.4673~~	~~7842.9~~	~~88.240~~	~~20.513~~	~~28.868~~	~~1316.3~~	~~184.13~~	~~8.8727~~
295	0.40531	2.4673	9934.9	166.91	20.513	28.868	1316.3	185.46	8.8409
~~300~~	~~0.39857~~	~~2.5089~~	~~7987.3~~	~~88.725~~	~~20.549~~	~~28.902~~	~~1326.9~~	~~186.51~~	~~8.9746~~
300	0.39857	2.5089	10079	167.39	20.549	28.902	1326.9	187.86	8.9439
~~305~~	~~0.39206~~	~~2.5506~~	~~8131.9~~	~~89.203~~	~~20.583~~	~~28.934~~	~~1337.5~~	~~188.90~~	~~9.0759~~
305	0.39206	2.5506	10224	167.87	20.583	28.934	1337.5	190.23	9.0464
~~310~~	~~0.38576~~	~~2.5923~~	~~8276.7~~	~~89.674~~	~~20.614~~	~~28.963~~	~~1348.0~~	~~191.29~~	~~9.1767~~
310	0.38576	2.5923	10369	168.34	20.614	28.963	1348.0	192.59	9.1484
~~315~~	~~0.37966~~	~~2.6339~~	~~8421.5~~	~~90.138~~	~~20.642~~	~~28.990~~	~~1358.5~~	~~193.59~~	~~9.2770~~
315	0.37966	2.6339	10513	168.80	20.642	28.990	1358.5	194.92	9.2500
~~320~~	~~0.37375~~	~~2.6756~~	~~8566.6~~	~~90.594~~	~~20.668~~	~~29.015~~	~~1368.8~~	~~195.88~~	~~9.3767~~
320	0.37375	2.6756	10659	169.26	20.668	29.015	1368.8	197.24	9.3510
~~325~~	~~0.36802~~	~~2.7172~~	~~8711.7~~	~~91.044~~	~~20.692~~	~~29.037~~	~~1379.1~~	~~198.43~~	~~9.4759~~
325	0.36802	2.7172	10804	169.71	20.692	29.037	1379.1	199.53	9.4515
~~330~~	~~0.36247~~	~~2.7589~~	~~8856.9~~	~~91.488~~	~~20.715~~	~~29.058~~	~~1389.4~~	~~200.97~~	~~9.5746~~
330	0.36247	2.7589	10949	170.15	20.715	29.058	1389.4	201.81	9.5517
~~335~~	~~0.35708~~	~~2.8005~~	~~9002.3~~	~~91.925~~	~~20.735~~	~~29.077~~	~~1399.6~~	~~203.47~~	~~9.6728~~
335	0.35708	2.8005	11094	170.59	20.735	29.077	1399.6	204.06	9.6513

TABLE 1 *Continued*

T (K)	ρ (mol·L^{-1})	*V* (L^{-1}·mol)	*H* (J·mol^{-1})	*S* (J·mol^{-1}·K^{-1})	C_v (J·mol^{-1}·K^{-1})	C_p (J·mol^{-1}·K^{-1})	c (m·s^{-1})	λ (mW·m^{-1}·K^{-1})	η (μPa·s)
340	0.35184	2.8422	9147.7	92.356	20.754	29.094	1409.7	205.97	9.7705
340	0.35185	2.8422	11240	171.02	20.753	29.094	1409.7	206.31	9.7505
345	0.34676	2.8838	9293.2	92.781	20.771	29.110	1419.7	208.48	9.8677
345	0.34676	2.8838	11385	171.45	20.771	29.110	1419.7	208.53	9.8493
350	0.34183	2.9254	9438.8	93.200	20.786	29.125	1429.7	210.98	9.9645
350	0.34183	2.9254	11531	171.87	20.786	29.125	1429.7	210.74	9.9477
355	0.33703	2.9671	9584.5	93.613	20.800	29.138	1439.7	213.44	10.0610
355	0.33703	2.9671	11676	172.28	20.800	29.138	1439.7	212.93	10.0460
360	0.33237	3.0087	9730.2	94.021	20.813	29.150	1449.5	215.90	10.1570
360	0.33237	3.0087	11822	172.69	20.813	29.150	1449.5	215.11	10.1430
365	0.32783	3.0503	9876.0	94.423	20.825	29.161	1459.3	218.22	10.2520
365	0.32783	3.0503	11968	173.09	20.825	29.161	1459.3	217.27	10.2400
370	0.32342	3.0919	10022.0	94.820	20.836	29.171	1469.1	220.53	10.3470
370	0.32342	3.0919	12114	173.49	20.836	29.171	1469.1	219.42	10.3370
375	0.31913	3.1336	10168.0	95.211	20.846	29.180	1478.8	222.94	10.4410
375	0.31913	3.1336	12260	173.88	20.846	29.180	1478.8	221.56	10.4330
380	0.31494	3.1752	10314.0	95.598	20.855	29.188	1488.4	225.36	10.5360
380	0.31494	3.1752	12406	174.26	20.855	29.188	1488.4	223.68	10.5300
385	0.31087	3.2168	10460.0	95.979	20.863	29.195	1498.0	227.68	10.6290
385	0.31087	3.2168	12551	174.65	20.863	29.195	1498.0	225.80	10.6250
390	0.30690	3.2584	10606.0	96.356	20.871	29.202	1507.5	230.00	10.7230
390	0.30690	3.2584	12697	175.02	20.871	29.202	1507.5	227.90	10.7200
395	0.30303	3.3000	10752.0	96.728	20.878	29.208	1517.0	232.33	10.8150
395	0.30303	3.3000	12844	175.39	20.877	29.208	1517.0	229.99	10.8150
400	0.29925	3.3416	10898.0	97.096	20.884	29.214	1526.4	234.65	10.9080
400	0.29925	3.3416	12990	175.76	20.884	29.214	1526.4	232.06	10.9100
405	0.29557	3.3833	11044.0	97.459	20.889	29.219	1535.8	236.73	11.0000
405	0.29557	3.3833	13136	176.13	20.889	29.219	1535.8	234.13	11.0040
410	0.29198	3.4249	11190.0	97.817	20.895	29.223	1545.1	238.81	11.0920
410	0.29198	3.4249	13282	176.48	20.895	29.223	1545.1	236.19	11.0980
415	0.28848	3.4665	11336.0	98.171	20.899	29.227	1554.3	241.14	11.1830
415	0.28848	3.4665	13428	176.84	20.899	29.227	1554.3	238.24	11.1920
420	0.28506	3.5081	11482.0	98.521	20.904	29.231	1563.5	243.47	11.2740
420	0.28506	3.5081	13574	177.19	20.904	29.231	1563.5	240.27	11.2850
425	0.28172	3.5497	11628.0	98.867	20.908	29.235	1572.7	245.80	11.3650
425	0.28172	3.5497	13720	177.53	20.908	29.235	1572.7	242.30	11.3780
430	0.27845	3.5913	11774.0	99.209	20.912	29.238	1581.8	248.14	11.4550
430	0.27845	3.5913	13866	177.88	20.912	29.238	1581.8	244.33	11.4710
435	0.27526	3.6329	11921.0	99.547	20.915	29.241	1590.8	250.47	11.5450
435	0.27526	3.6329	14013	178.21	20.915	29.241	1590.8	246.34	11.5630
440	0.27215	3.6745	12067.0	99.882	20.918	29.244	1599.8	252.81	11.6340
440	0.27215	3.6745	14159	178.55	20.918	29.244	1599.8	248.34	11.6550
445	0.26910	3.7161	12213.0	100.210	20.922	29.246	1608.8	255.15	11.7240
445	0.26910	3.7161	14305	178.88	20.921	29.246	1608.8	250.34	11.7470
450	0.26612	3.7577	12359.0	100.540	20.924	29.249	1617.7	257.49	11.8130
450	0.26612	3.7577	14451	179.21	20.924	29.249	1617.7	252.33	11.8380
455	0.26321	3.7993	12506.0	100.860	20.927	29.251	1626.5	259.84	11.9010
455	0.26321	3.7993	14597	179.53	20.927	29.251	1626.5	254.31	11.9290
460	0.26036	3.8409	12652.0	101.180	20.930	29.253	1635.3	262.18	11.9890
460	0.26036	3.8409	14744	179.85	20.930	29.253	1635.3	256.29	12.0200
465	0.25757	3.8825	12798.0	101.500	20.933	29.256	1644.1	264.53	12.0770
465	0.25757	3.8825	14890	180.16	20.933	29.256	1644.1	258.26	12.1110
470	0.25484	3.9241	12944.0	101.810	20.935	29.258	1652.8	266.88	12.1650
470	0.25484	3.9241	15036	180.48	20.935	29.258	1652.8	260.22	12.2010
475	0.25217	3.9657	13091.0	102.120	20.938	29.260	1661.5	269.23	12.2520
475	0.25217	3.9656	15183	180.79	20.938	29.260	1661.5	262.18	12.2910
480	0.24955	4.0072	13237.0	102.430	20.940	29.262	1670.1	271.58	12.3390
480	0.24955	4.0072	15329	181.09	20.940	29.262	1670.1	264.13	12.3810
485	0.24698	4.0488	13383.0	102.730	20.943	29.264	1678.7	273.94	12.4260
485	0.24698	4.0488	15475	181.40	20.943	29.264	1678.7	266.08	12.4710
490	0.24447	4.0904	13530.0	103.030	20.945	29.266	1687.2	276.29	12.5130
490	0.24447	4.0904	15622	181.70	20.945	29.266	1687.2	268.02	12.5600
495	0.24201	4.1320	13676.0	103.330	20.948	29.268	1695.7	278.65	12.5990
495	0.24201	4.1320	15768	181.99	20.948	29.268	1695.7	269.96	12.6490
500	0.23960	4.1736	13822.0	103.620	20.950	29.271	1704.1	281.01	12.6850
500	0.23960	4.1736	15914	182.29	20.950	29.271	1704.1	271.89	12.7380
				2.0 MPa					
50	5.73450	0.1744	1340.3	36.406	13.137	29.720	575.3	48.33	2.8287
50	5.7345	0.17438	3432.2	115.07	13.1370	29.720	575.26	49.217	2.7767
55	4.94150	0.2024	1481.7	39.105	13.037	27.145	611.3	49.72	2.9699
55	4.9415	0.20237	3573.7	117.77	13.0370	27.145	611.25	50.851	2.9133
60	4.37520	0.2286	1613.5	41.399	13.013	25.692	643.5	51.65	3.1238
60	4.3752	0.22856	3705.5	120.07	13.0130	25.692	643.47	52.877	3.0602
65	3.94300	0.2536	1739.6	43.418	13.047	24.800	672.7	53.88	3.2810