THERMODYNAMIC PROPERTIES OF AIR

These tables summarize the thermodynamic properties of air in the liquid and gaseous states, as well as along the saturation line. In the table for the saturation state, *P*(boil) is the bubble point temperature (i.e., the pressure at which boiling begins as the temperature of the liquid is raised), and *P*(con) is the dew point temperature (pressure at which condensation begins as the temperature of the gas is lowered). The other properties tabulated are density (ρ), enthalpy (*H*), entropy (*S*), and isobaric heat capacity (C_p). More detailed tables may be found in the references.

REFERENCES

1. Vasserman, A.A., and Rabinovich, V.A., *Thermophysical Properties of Liquid Air and its Components*, Izdatel'stvo Komiteta, Standartov, Moscow, 1968.
2. Vasserman, A.A., et al., *Thermophysical Properties of Air and Air Components*, Izdatel'stvo Nauka, Moscow, 1966.

Properties in the saturation state:

T **K**	***P*(boil)** **bar**	***P*(con)** **bar**	**ρ (liq)** **g/cm^3**	**ρ (gas)** **g/L**
65	0.1468	0.0861	0.939	0.464
70	0.3234	0.2052	0.917	1.033
75	0.6366	0.4321	0.894	2.048
80	1.146	0.8245	0.871	3.709
85	1.921	1.453	0.845	6.258
90	3.036	2.397	0.819	9.980
95	4.574	3.748	0.792	15.21
100	6.621	5.599	0.763	22.39
110	12.59	11.22	0.699	45.15
120	21.61	20.14	0.622	87.34
130	34.16	33.32	0.487	184.33
132.55	37.69	37.69	0.313	312.89

Properties of liquid air:

P **bar**	***T*** **K**	ρ **g/cm^3**	***H*** **J/g**	***S*** **J/g K**	C_p **J/g K**
1	75	0.8935	–131.7	2.918	1.843
5	75	0.8942	–131.4	2.916	1.840
5	80	0.8718	–122.3	3.031	1.868
5	85	0.8482	–112.9	3.143	1.901
5	90	0.8230	–103.3	3.250	1.941
5	95	0.7962	–93.5	3.356	1.991
10	75	0.8952	–131.1	2.913	1.836
10	80	0.8729	–122.0	3.028	1.863
10	90	0.8245	–103.1	3.246	1.932
10	100	0.7695	–83.2	3.452	2.041
50	75	0.9025	–128.2	2.892	1.806
50	100	0.7859	–81.8	3.415	1.939
50	125	0.6222	–28.3	3.889	2.614
50	150	0.1879	91.9	4.764	2.721
100	75	0.9111	–124.5	2.867	1.774
100	100	0.8033	–79.4	3.376	1.852
100	125	0.6746	–31.4	3.805	2.062
100	150	0.4871	32.8	4.271	2.832

Properties of air in the gaseous state:

P **bar**	***T*** **K**	ρ **g/L**	***H*** **J/g**	***S*** **J/g K**	C_p **J/g K**
1	100	3.556	98.3	5.759	1.032
1	200	1.746	199.7	6.463	1.007
1	300	1.161	300.3	6.871	1.007

THERMODYNAMIC PROPERTIES OF AIR (continued)

P **bar**	***T*** **K**	ρ **g/L**	***H*** **J/g**	***S*** **J/g K**	C_p **J/g K**
1	500	0.696	503.4	7.389	1.030
1	1000	0.348	1046.6	8.138	1.141
10	200	17.835	195.2	5.766	1.049
10	300	11.643	298.3	6.204	1.021
10	500	6.944	502.9	6.727	1.034
10	1000	3.471	1047.2	7.477	1.142
100	200	213.950	148.8	4.949	1.650
100	300	116.945	279.9	5.486	1.158
100	500	66.934	499.0	6.048	1.073
100	1000	33.613	1052.4	6.812	1.151