TABLE 1-1

Collision integrals computed from the Stockmayer potential

$T^* = T/T_\epsilon$	Ω_v	Ω_v [Eq. (1-34)]
0.3	2.840	2.928
1.0	1.593	1.591
3.0	1.039	1.060
10.0	0.8244	0.8305
30.0	0.7010	0.7015
100.0	0.5887	0.5884
400.0	0.4811	0.4811

Source: Data from Hirschfelder et al. (1954).

TABLE 1-2

Power-law and Sutherland-law viscosity parameters for gases [Eqs. (1-35) and (1-36)]†

Gas	T_0, K	μ_0, N · s/m^2	n	Error, %, temperature range, K	S, K	Temperature range for 2% error
Air	273	1.716E−5	0.666	±4 210–1900	111	170–1900
Argon	273	2.125E−5	0.72	±3 200–1500	144	120–1500
CO_2	273	1.370E−5	0.79	±5 209–1700	222	190–1700
CO	273	1.657E−5	0.71	±2 230–1500	136	130–1500
N_2	273	1.663E−5	0.67	±3 220–1500	107	100–1500
O_2	273	1.919E−5	0.69	±2 230–2000	139	190–2000
H_2	273	8.411E−6	0.68	±2 80–1100	97	220–1100
Steam	350	1.12E−5	1.15	±3 280–1500	1064	360–1500

Source: Data from Hilsenrath et al. (1955).

†No data given above maximum temperature listed. Formulas inaccurate below minimum temperature listed.

TABLE 1-3

Power-law and Sutherland-law thermal-conductivity parameters for gases [Eqs. (1-44*a*) and (1-44*b*)]

Gas	T_0, K	k_0, W/m · K	n	Error, % temperature range, K	S, K	Temperature range for ±2% error, K
Air	273	0.0241	0.81	±3 210–2000	194	160–2000
Argon	273	0.0163	0.73	±4 210–1800	170	150–1800
CO_2	273	0.0146	1.30	±2 180–700	1800	180–700
CO	273	0.0232	0.82	±2 210–800	180	200–800
N_2	273	0.0242	0.74	±3 210–1200	150	200–1200
O_2	273	0.0244	0.84	±2 220–1200	240	200–1200
H_2	273	0.168	0.72	±2 200–1000	120	200–1000
Steam	300	0.0181	1.35	±2 300–900	2200	300–700

Source: Data from White (1988).

TABLE 1-4

Bulk modulus K and expansion coefficient β for water at saturation conditions

T, K	p_{sat}, kPa	βT	K, MPa
273	0.61	−0.019	2,062
293	2.34	0.057	2,230
313	7.38	0.119	2,304
333	19.92	0.176	2,301
353	47.35	0.230	2,235
373	101.3	0.281	2,120
423	461	0.447	1,692
473	1,580	0.637	1,190
523	3,970	0.985	716
573	8,560	1.80	342
623	16,500	4.8	82
647*	22,090*	∞	0

*Critical point.

TABLE 1-5

Surface-tension coefficient for an air–water interface

T, °C	$\mathcal{T}$, N/m	T, °C	$\mathcal{T}$, N/m
0	0.0757	200	0.0377
20	0.0727	220	0.0331
40	0.0696	240	0.0284
60	0.0662	260	0.0237
80	0.0627	280	0.0190
100	0.0589	300	0.0144
120	0.0550	320	0.0099
140	0.0509	340	0.0056
160	0.0466	360	0.0019
180	0.0422	374*	0.0*

*Critical point.