

APPENDIX B

TABLES OF SELECTED PHYSICAL
CONSTANTS

Table B.1
Density, Molecular Mass, Volume Thermal Expansion and Isothermal
Compressibility Coefficients
Solid < >, Liquid []

Substance	ρ gm/cm ³	M gm/(gm·mol)	α K ⁻¹	β atm ⁻¹
<Ag> ^a	10.49	107.88	19.68 x 10 ⁻⁶	—
<Au> ^a	19.3	197	—	—
[Au] ^d	17.0	197	—	—
<C> ^{a,1}	2.25	12.01	—	—
<Ca _α > ^{b,1}	1.55	40.08	—	—
<Cu> ^{a,c}	8.96	63.54	16.50 x 10 ⁻⁶	7.60 x 10 ⁻⁶
<Fe> ^a	7.85	55.85	—	—
<Fe ₃ C> ^d	7.40	179.40	—	—
H ^e	—	1.01	—	—
K ^e	—	39.10	—	—
Li ^e	0.53	6.941	—	—
O ^e	—	15.99	—	—
Pb ^e	—	207.2	—	—
S ^e	—	32.06	—	—
Sb ^e	6.68	121.75	—	—
<Si> ^a	2.35	28.09	—	—
[Si] ^b	2.57	28.09	—	—
Ti ^e	—	47.90	—	—

References:

- (a) Metals Handbook, Desk Edition, 1985, Chapter 1, p. 44.
(1) <C> = Graphite.
- (b) Handbook of Chemistry and Physics, 1989, 70th edition, p. B-11.
(1) The density, ρ , of <Ca> at 293 K.
- (c) Darken and Gurry, 1953, p. 498 for β .
- (d) Handbook of Chemistry and Physics, 1948, 30th edition, p. 368.
- (e) Periodic Table of the Elements, 1979, Sargent-Welch Scientific Co.

Table B.2
Standard Molar Volumes, Volume Thermal Expansion
and Isothermal Compressibility Coefficients

$$P^0 = 1 \text{ bar}, T = 298 \text{ K.}$$

Solid < >, Liquid [], Gas ().

Substance	V cm ³ /mol	α K ⁻¹	β atm ⁻¹	Ref.*
Graphite <C>	5.30	$28,301.89 \times 10^{-9}$	2641.51×10^{-9}	1
Lawsonite ^a	101.32	2.47×10^{-5}	8.90×10^{-7}	1
Aragonite <CaCO ₃ >	34.15	—	—	2
Tremolite ^b	272.70	30.99×10^{-6}	1.32×10^{-6}	1
<CaSiO ₃ > ^c	39.93	2.404×10^{-5}	901.58×10^{-9}	1
[H ₂ O]	18.069	—	—	2
Spinel ^d	39.78	25.89×10^{-6}	477.63×10^{-9}	1
Pyrope Garnet ^e	113.18	2.63×10^{-5}	5.57×10^{-7}	1
(O ₂)	24,789.20	—	—	2

* References:

(1) Holland, 1990, Table 7, p. 103.

(2) Robie et al., 1979.

Footnotes:

(a) Lawsonite: <CaAl₂Si₂O₇(OH)₂·H₂O>

(b) Tremolite: <Ca₂Mg₅Si₈O₂₂(OH)₂>

(c) Wollastonite: <CaSiO₃>

(d) Spinel: <MgAl₂O₄>

(e) Pyrope Garnet: <Mg₃Al₂Si₃O₁₂>