Appendix F: Some Useful Constants

Acceleration of gravity (at sea level and 45° latitude)	$g = 9.80616$ m sec^{-2}
Angular velocity of rotation of the earth	$\omega = 7.27221 \times 10^{-5}$ rad sec^{-1}
Avogadro's number	$N_0 = 6.02297 \times 10^{23}$ molecule mol^{-1}
Boltzmann's constant	$K = 1.38062 \times 10^{-23}$ J K^{-1}
Density of air at standard pressure and temperature	$\rho = 1.273 \times 10^{-3}$ g cm$^{-3} = 1.273$ kg m^{-3}
Density of ice (0°C)	$\rho_i = 0.917$ g cm$^{-3} = 0.917 \times 10^3$ kg m^{-3}
Density of liquid water (4°C)	$\rho_\ell = 1$ g cm$^{-3} = 1 \times 10^3$ kg m^{-3}
Electron charge	$e = 1.60219 \times 10^{-19}$ C (coulomb, mks)
Gravitational constant	$G = 6.673 \times 10^{-11}$ N m^2 kg^{-2}
Latent heat of condensation at 0°C	$L_c = 2.5 \times 10^6$ J kg^{-1}
Loschmidt's number (at standard temperature and pressure)	$n_0 = 2.68719 \times 10^{25}$ molecule m^{-3}
Mass of an electron	$m_e = 9.10956 \times 10^{-31}$ kg
Mass of the earth	$M_e = 5.988 \times 10^{24}$ kg
Mean distance between the earth and the sun	$r_0 = 1.49598 \times 10^{11}$ m
Mean radius of the earth	$a_e = 6.37120 \times 10^6$ m
Mean radius of the sun (visible disk)	$a_s = 6.96000 \times 10^8$ m
Molecular weight of dry air	$M = 28.97$ g mol^{-1}
Permeability of vacuum	$\mu_0 = 12.56637 \times 10^{-7}$ kg m C^{-2} (mks) $= 1$ Gaussian unit (cgs)
Permittivity of vacuum	$\varepsilon_0 = 8.85419 \times 10^{-12}$ C kg^{-1} m^{-3} sec^2 (mks) $= 1$ Gaussian unit (cgs)
Planck's constant	$h = 6.62620 \times 10^{-34}$ J sec
Saturation vapor pressure (0°C)	$e_0 = 6.1078$ mb $= 0.61078$ k Pa
Solar constant	$S \cong 1366$ W m^{-2} (J sec^{-1} m^{-2})
Specific heat of air at constant pressure	$C_p = 10.04 \times 10^2$ m^2 sec^{-2} K^{-1}
Specific heat of air at constant volume	$C_v = 7.17 \times 10^2$ m^2 sec^{-2} K^{-1}
Standard pressure	$p_0 = 1013.25$ mb $= 101.325$ k Pa
Standard temperature	$T_0 = 273.16$ K
Stefan-Boltzmann constant	$\sigma = 5.66961 \times 10^{-8}$ J m^{-2} sec^{-1} K^{-4}
Universal gas constant	$R^* = 8.31432$ J mol^{-1} K^{-1}
Velocity of light	$c = 2.99792458 \times 10^8$ m sec^{-1}
Wien's displacement constant	$\alpha = 0.2897 \times 10^{-2}$ m K