APPENDIX E
UNITS AND CONVERSION FACTORS

Quantity	Conversion
Length	1 m = 100 cm = 3.28084 ft = 39.3701 in.
Mass	1 kg =10^3 g = 2.20462 $1b_m$
Force	1 N = 1 kg (m/s ^{2}) = 0.224809 $1b_f$
Pressure	1 bar = 10^5 kg/(m s^2) = 10^5 N/m^2 =10^5 Pa = 10^2 kPa =0.986923 atm = 14.5038 psia =7 50.061 torr
Volume	1 m^3 = 10^6 cm^3 =35.31417 ft^3
Density	1 g/cm^3 = 10^{-3} kg/m^3 = 62.4278 lb_m/ ft^3
Energy	1 J= 1 kg (m^2/s^2) = 1 N m = 1 m^3 Pa = 10^{-5} m^3 bar = 10 cm^3 bar = 9.86923 cm^3 (atm) = 0.239006 cal = 5.12197 × 10^{-3} ft^3 psia = 0.737562 ft lb_f = 9.47831 × 10^{-4} (Btu)
Power	1 kW = 10^3 W = 10^3 kg (m^2/s^3) = 10^3 J/s = 239.006 cal/s = 737.562 ft lb_f/s = 0.947831 Btu/s = 1.34102 hp

Values of the universal gas constant *R*

= 8.314 J mol^{-1} K^{-1} = 8.314 m^3 Pa mol^{-1} K^{-1}

= 8.314 × 10^{-3} m^3 kPa mol^{-1} K^{-1} = 8314 cm^3 kPa mol^{-1} K^{-1}

= 82.06 cm 3 (atm) mol^{-1} K^{-1} = 62.356 cm^3 (torr) mol^{-1} K^{-1}

= 1.987(cal) mol^{-1} K^{-1} = 1.986(Btu)(lb mole)$^{-1}$ (°R)$^{-1}$

= 0. 71302 $(ft)^3$ (atm)(lb mo1)$^{-1}$(°R)$^{-1}$ = 10.73($ft)^3$ (psia) (1b mol)$^{-1}$(°R)$^{-1}$

= 1,545(ft)(lb_f)(lb mol)$^{-1}$(°R)$^{-1}$