Constants & Useful Conversion Formulae

$h=6.626 \times 10^{-34}$ J s = 4.135×10^{-15} eV s $\hbar=h/2\pi$

$m_{oe}= 9.11 \times 10^{-31}$ kg electron rest mass

$m_{oe}=0.51 MeV/c^2$ $c^2 m_{eo}=0.51 MeV$

$m_{op}=938.279$ MeV/c^2=1836 m_{oe} proton rest mass

1eV=1.6 x 10-19 J = 23.053 kcal/mol [energy] = [J]=[eV]= [kgm2/s2]

$c= 3 \times 10^8$ m/s =(2.9979 x 10^8 m/s) velocity of light

hc=12430 eV A energy of a photon Eph= (1.24 x 10^3 eV nm)/λ λ in nm

$r=(4\pi\varepsilon_o\hbar^2)/(m_{eo}e^2)$=0.53 A Bohr's radius

Boltzman constant $k= 8.617 \times 10^{-5}$ eV/K

kT=0.0259 eV (@T=300K) thermal energy unit

$\hbar k=p=mv$ momentum $k=2\pi/\lambda$ wave number

$\lambda=h/p=h/(2mE)^{1/2}$ wave length; $f=\nu = (v=c)/\lambda$ frequency

E_n=-13.6 eV/n^2 hydrogen atom energy states

$\Lambda=h/(m_{eo}c)=hc/m_{eo}c^2$=12430 ev A/0.51 10^6 eV=0.024 A Compton length

$\sigma= 5.670 \times 10^{-8}$ Js^{-1} m^{-2} K^{-4} Stefan's constant

Energy conversion factor 1 J = 6.24×10^{18} eV

Avogadro constant $N_A=6.02204 \times 10^{23}$ mol^{-1}

Universal Gas constant R= N_A k = 5.19×10^{19} eV/(K mol)

1 Angstrom = 10^{-10} m

$$\lambda_e = \frac{12.35}{\sqrt{E}} A \qquad [E] = [eV]$$