Chapter 29 – 32: UNITS

Some conversions:

$1\ \text{eV} = 1.6 \times 10^{-19}\ \text{J}$

$1\ \text{u} = 1.6605 \times 10^{-27}\ \text{kg}$

$1\ \text{R} = 2.58 \times 10^{-4}\ \text{C/kg}$

$1\ \text{rad} = 0.01\ \text{J/kg}$

$1\ \text{curie} = 3.70 \times 10^{10}\ \text{decays/sec}$

$c^2 = 931.493\ \frac{\text{MeV}}{\text{u}}$

	MKS (SI)	CGS
Mass (u = atomic mass unit, frequently used in nuclear physics)	kg	g
Length	m	cm
Time	sec	sec
Velocity	$\frac{\text{m}}{\text{sec}}$	$\frac{\text{cm}}{\text{sec}}$
Force	N $\left(= \text{Newton} = \frac{\text{kg·m}}{\text{s}^2}\right)$	dyne $\left(= \frac{\text{g·cm}}{\text{s}^2}\right)$
Momentum	$\frac{\text{kg·m}}{\text{sec}}$	$\frac{\text{g·cm}}{\text{sec}}$
Energy (eV frequently used in atomic physics and MeV in nuclear physics)	J	erg
Power	$\text{W} = \frac{\text{J}}{\text{sec}}$	$\frac{\text{erg}}{\text{sec}}$
Frequency = $f = \frac{1}{T}$	Hz $\left(= \frac{1}{\text{sec}}\right)$	Hz
Wavelength = λ	m	cm
Work function = W_0	J (eV frequently used)	erg
Angular momentum = L **(Note that Planck's constant [h] has units of angular momentum)**	$\frac{\text{kg·m}^2}{\text{s}}$ (= torque × time = N·m·sec)	$\frac{\text{g·cm}^2}{\text{s}}$ (= dyne·cm·sec)
Activity = Rate of nuclear decay = $\lvert\Delta N/\Delta t\rvert$	1 Bq = 1 becquerel = 1 decay/sec	1 Bq
Decay constant = λ	$\frac{1}{\text{sec}}$	$\frac{1}{\text{sec}}$
Half-life = $T_{1/2}$	sec	sec