BOHR THEORY OF ATOM

$E = h * f$

$E = E_m - E_n \quad m > n$

$m_e = 9.109 \times 10^{-31}$ kg

1 eV = 1.6×10^{-19} J

$h = 6.6 \times 10^{-34}$ J · s

or (J/Hz)

QUANTUM EFFECTS

Photon Energy = $h * f$

$\lambda = h / m * v$

$2 * \pi * r = \lambda$, $2 * \pi * r = 2 * \lambda$, $2 * \pi * r = 3 * \lambda$

$\Delta x * \Delta mv = h$

$mvr = h/2\pi$, $2 * h/2\pi$, $3 * h/2\pi$

Probability = ψ^2

$1u = 1.66 \times 10^{-27}$ kg

λ (m)

r = radius (m)

ψ (matter wave amplitude)

NUCLEUS

$m_p = 1.6726 \times 10^{-27}$ kg

$m_n = 1.6750 \times 10^{-27}$ kg

Nucleus notation $^{A}_{Z}$Name

A = total nucleons (ATOMIC NUMBER)

Z = number of protons

N = total neutrons

Also $A = Z + N$ ← ATOMIC NUMBER

RADIOACTIVITY + NUCLEAR DECAY

1 Ci = 3.7×10^{10} decays/sec

$A \propto NUM$ (ACTIVITY) NUM = NUMBER OF NUCLEI

A (Ci), (Bq), (decays / s)

1 Bequerel = 1 decay/second

$A \propto L$ (ACTIVITY)

L (1/s)

DECAY CONSTANT

$^{4}_{2}\alpha$ = nucleus of Helium atom

$^{0}_{-1}\beta$ = electron from the nucleus

γ = high energy photon from the nucleus.

$L = 0.693 / t_{1/2}$ DECAY CONSTANT

$t_{1/2}$ (s), (m), (hr), (y)

$E = m c^2$

E (J), (eV)

$c = 3 \times 10^8$ m/s

1 eV = 1.6×10^{-19} J

1 rad = 10^{-2} J/kg absorbed

1 rem = 10^{-2} J/kg biological