

Chap 6 - Electronic Structure of Atoms

#e⁻ in an atom = #p
 neutral

Where → outside nucleus, in e⁻ clouds
 energy levels.

Calc amt energy at each level
 E in J

Oct 24-8:34 AM

- e⁻ move closer to nucleus on own
- IF Add E, can get an e⁻ to move further away from nucleus.

Stay away until E runs out
 Then fall back to ground state
 giving off energy as light of
 a certain color

Oct 24-8:41 AM

Measure Color \approx amt of E. released ^(I)

λ Wavelength, (meters)

nm = nano meters.
 $\rightarrow 1 \times 10^{-9} \text{ m}$

frequency (Hz = Hertz)

$\frac{\#}{\text{time}}$

$\frac{1}{\text{sec}} = \text{Sec}^{-1} = \text{s}^{-1}$

excited \rightarrow ground

Oct 24-8:45 AM

Wave

$\lambda * f = c$

$\frac{\text{m}}{\text{sec}} * \frac{1}{\text{sec}} = \frac{\text{m}}{\text{sec}}$

constant \leftarrow speed of light.

VELOCITY

$3 \times 10^8 \text{ m/sec}$

amplitude

1 wavelength. (m)

freg = # waves / sec

Oct 24-8:50 AM

$\frac{1}{\lambda} \propto \frac{1}{f}$ (property)
 $(\nearrow)(f) \propto 1$
 $(\nearrow)(f) = c$ (equality)
 Add constant \rightarrow

$2 \times \text{frequency} \Rightarrow \frac{1}{2} \text{ wavelength.}$

Oct 24-8:52 AM

$f \uparrow$, $\lambda \downarrow$, $E \uparrow$
 μ

$E \propto f$

$E = hf$ (boxed)
 \downarrow
 Planck's constant

$\frac{\text{J}}{\text{sec}} \times \text{J} = h \frac{1}{\text{sec}} \times \frac{\text{J}}{\text{sec}}$

$h = \text{J} \cdot \text{sec}$ (boxed)
 $6.63 \times 10^{-34} \frac{\text{J} \cdot \text{sec}}$

Oct 24-9:00 AM

$f = \frac{c}{\lambda}$, $C = f\lambda$, $E = hf$, $E = mc^2$
 $J = \frac{kg \cdot m^2}{sec^2}$
 $hf = mc^2$
 $hf = mv^2$ ← any speed not just S.O.L.
 $\frac{h\nu}{\lambda} = \frac{mv^2}{\lambda}$
 $\frac{h\nu}{mv} = \lambda$
 $\lambda = \frac{h}{mv}$ ← De Broglie Wavelength = $\frac{h}{p}$ Momentum

Oct 24-9:08 AM

6 / 15 + 17

Oct 24-9:16 AM