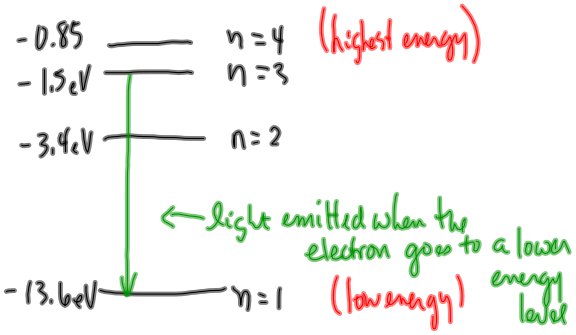
Calculation of a wavelength for an energy level transition:



$E_n = \frac{-13.6\ eV}{n^2}$

$E_1 = -13.6\ eV$

$E_2 = \frac{-13.6\ eV}{4}$

$E_2 = -3.4\ eV$

$\Delta E = E_f - E_i$

$\Delta E = -13.6eV - (-1.5eV)$

$\Delta E = -12.1eV$

↑ light emitted.

$E = hf$

$E = \frac{hc}{\lambda}$

$\lambda = \frac{hc}{E}$

$12.1\ eV\left(\frac{1.6\times10^{-19}J}{eV}\right) = \left(6.626\times10^{-34}\ J\cdot s\right) f$

$f = 2.9\times10^{15}\ Hz$

$c = \lambda f$

$\lambda = \frac{c}{f}$

$\lambda = \frac{3.00\times10^{8}\ m/s}{2.9\times10^{15}\ Hz}$

$\lambda = 1.0\times10^{-7}\ m$

100nm ← not visible UV?

Lyman Series → end at n = 1 (UV)

Balmer Series → end at n = 2 ?

Paschen Series → end at n = 3 ?