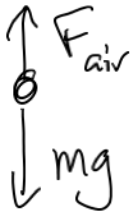
October 31

Happy Halloween! Have some candy

Quiz

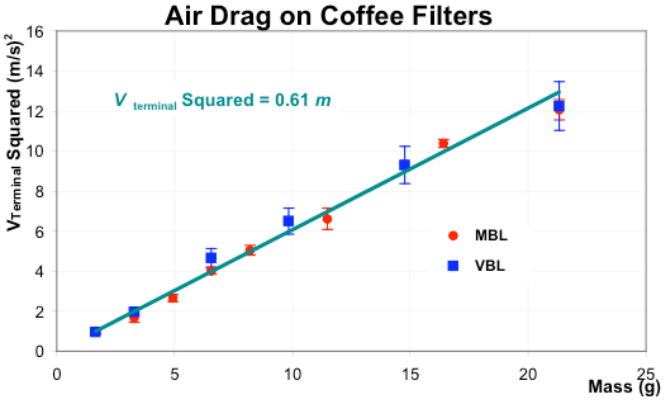
Air Drag



$$\Delta \vec{p} = \vec{F}_{net} \Delta t$$

$$0 = (F_{air} - mg)\Delta t$$

$\Rightarrow F_{air} = mg$ when at terminal velocity



$F \propto v, v^2, v^{1/2}, \ldots$

$F_{air} = bv = mg$

$\Rightarrow v = \frac{mg}{b}$

$F_{air} = bv^{1/2} = mg$

$v = \left(\frac{mg}{b}\right)^2$

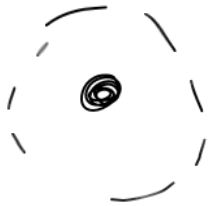
$F_{air} = bv^2 = mg$

$v = \sqrt{\frac{mg}{b}}$

Energy Levels for the Hydrogen Atom-
Quantized Photons

Quantum Mechanics

$$E_N = \frac{-13.6\,eV}{N^2} \qquad N = 1, 2, 3, \ldots$$



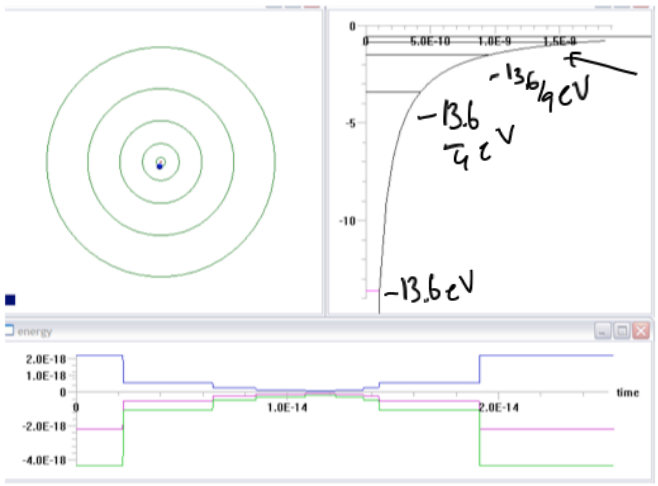
bound state since

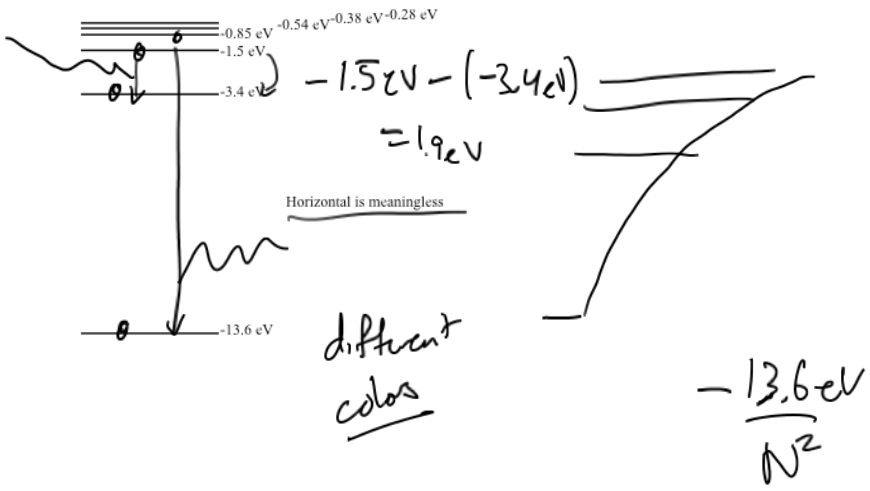
$$E = K + U < 0$$

$E_1 = -13.6\,eV$ ground state (lowest state)

$E_2 = \frac{-13.6}{4}\,eV = -3.4\,eV$

bohr_levels.py

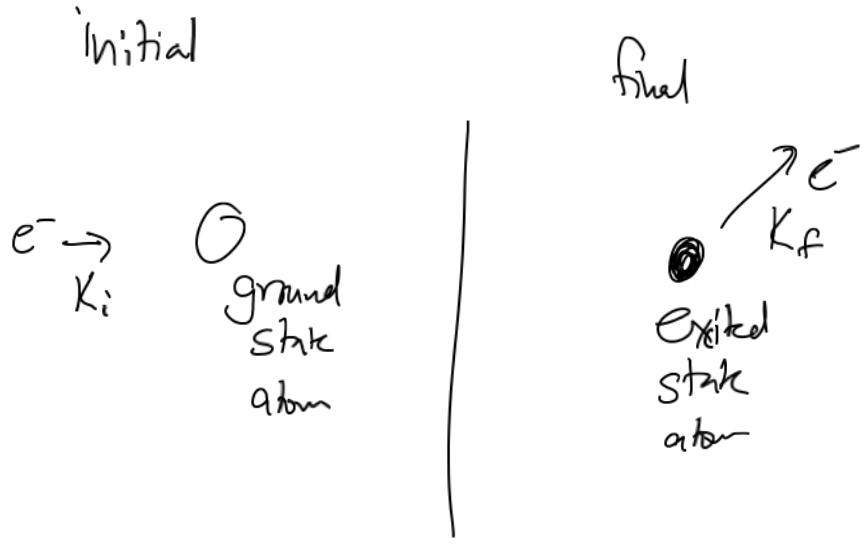




$-1.5\text{eV} - (-3.4\text{eV})$

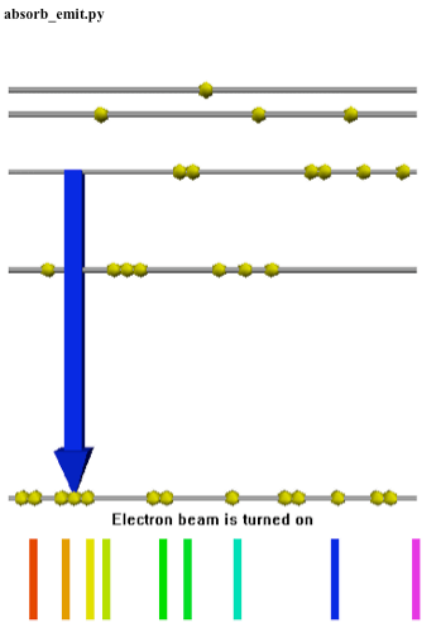
$= 1.9\text{eV}$

$-\frac{13.6\text{eV}}{N^2}$



$$\Delta E = E_f - E_i = W + Q = 0$$

$$\Delta E_{atom} = K_f - K_i$$



Color relates to energy

Violet photon has

energy ~ 3.1eV

red photon has ~ 1,8eV