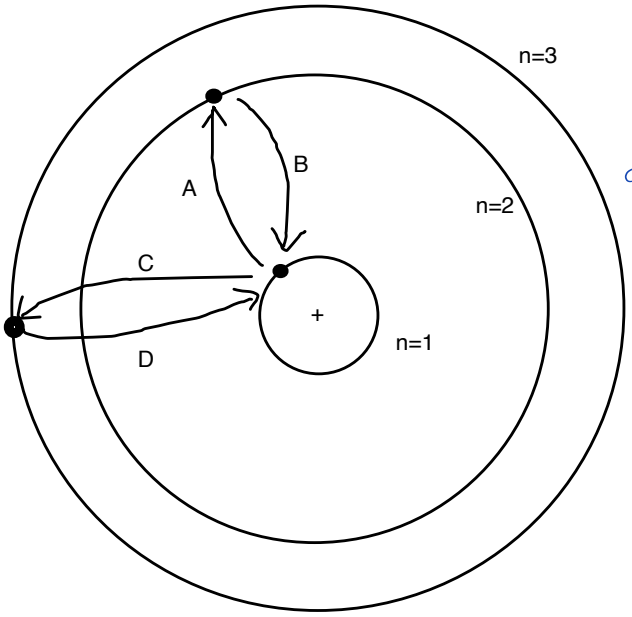


n = principle energy level

$2n^2$ = total # of e^- allowed @ that energy level

Value of n
$n = 0$ to ∞

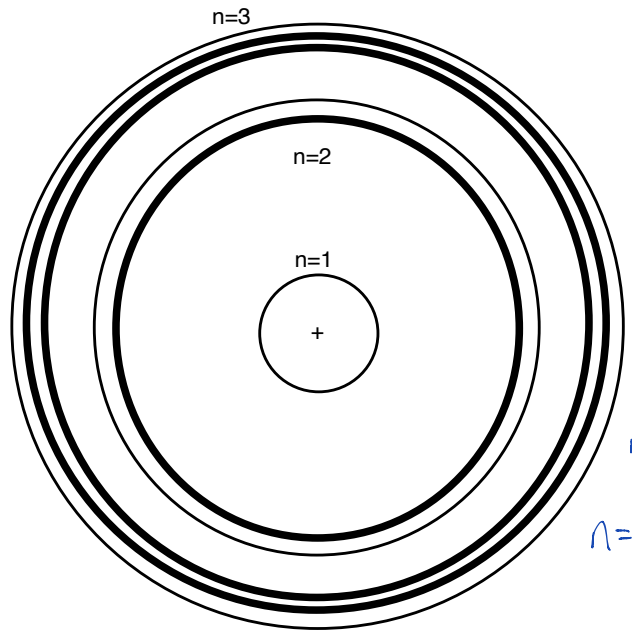
$n=1 \therefore 2e^-$

$n=2 \therefore 8e^-$

$n=3 \therefore 18e^-$

With a better electroscope . . .

Each spectral line was made up of several lines. Each energy level was actually divided into sublevels accor according to their principle energy level.



Value of ℓ
$\ell = 0$ to $n-1$

sublevels = ℓ

$n=1 \therefore \ell = 1$ | $\ell = 0$

$n=2 \therefore \ell = 2$ | $\ell_1 = 0$; $\ell_2 = 1$

When using a magnetic field each line separated

m_ℓ Each line had the same energy level so no new lines were needed

$m_\ell = -\ell$ to $+\ell$

if $\ell = 1$ then $m_\ell = -1, 0, +1$

When analyzing magnets + magnetism it was explained using electron spin. Shooting a beam of electrons through a magnetic field produced two beams. Additional spectral line analysis in magnetic fields supported the need for a fourth quantum number.

$m_s = +\frac{1}{2}$ or $-\frac{1}{2}$ for each m_ℓ