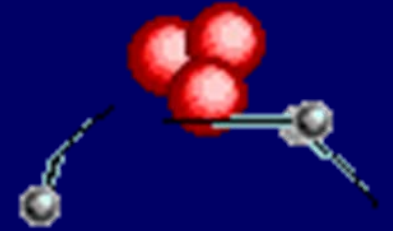


Quantum Numbers

Each electron in an atom is labeled by 4 #'s

n = Principal Quantum Number (1, 2, 3, ...)

- Determines energy (Bohr)



ℓ = Orbital Quantum Number (0, 1, 2, ... $n-1$)

- Determines angular momentum
- $\ell < n$ always true!

$$L = \sqrt{\ell(\ell + 1)} \frac{h}{2\pi}$$

m_ℓ = Magnetic Quantum Number ($-\ell, \dots 0, \dots \ell$)

- Component of ℓ
- $|m_\ell| \leq \ell$ always true!

$$L_z = m_\ell \frac{h}{2\pi}$$

m_s = Spin Quantum Number ($-\frac{1}{2}, +\frac{1}{2}$)

- “Up Spin” or “Down Spin”

Note differences
with Bohr model