

Chapter 6 – Electron Structure

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- Atoms gain and lose energy in set amounts – Quantized
- Lower energy level is ground state, higher is called excited
- An atom which gains energy moves electrons to a higher energy level
- An atom which loses energy has electrons move back down (Electron Jumping)
- Energy is seen as different wavelengths of light in a flame test
- $E = hV$ and $C = \lambda V$, where h is Planck's constant, V is the frequency, λ is the wavelength, C is the speed of light, and E is energy
- Bohr's Model – Electrons orbit the nucleus, and, when they gained energy, jump up to a new level
- Quantum Mechanical Model – It is unknown how electrons move, but we know where they probably are, which is demonstrated in probability maps
- Probability Maps – Orbitals (Four Types) s, p, d, and f (sometimes called sublevels)
- s forms a circular probability, p forms a 2 leaf clover, d forms 4 leaf clover, and f is technically 6, but is hard to map out
- 2 Electrons per orbital

	Type	Orbitals	Electrons
	s	1	2
•	p	3	6
	d	5	10
	f	7	14

- Electron configuration and Box diagrams (often called Orbital Diagrams)

- Quantum Numbers:
 1. Energy Level (n)
 2. Sublevel (l): Type (s=0; p=1; d=2; f=3)
 3. Box number (Number of orbitals, m_l): $-l \leq m_l \leq l$
 4. Spin (m_s): $-\frac{1}{2} \leq m_s \leq \frac{1}{2}$
- Hund's Rule – Electrons spread out
- Pauli Exclusion Principle – No two electrons have the same 4 quantum numbers