

Atomic Structure Review:

THE ELECTRON

- the more e- = the greater the (-) charge
- found in e- cloud
- move around in orbital -> set path & set # of e- on each path
- movement creates (electricity) ENERGY

Electron Orientation in an Atom

Quantum Mechanical Model:

- atom has no definite shape
- increase in # of e- = increase in size = increase in ENERGY

Orbital Notation

- states location of e- around the nucleus
- every atom has a different # of e-

HISTORY ~ 4 Models of Atoms

- 1) Thomson: ball of (+) charges in center with e- outside
--NOT # of p & n, or arrangements in atom
- 2) Rutherford: showed nucleus had most of atom's mass
--NOT nucleus contains p & n, or (+) attract (-)
- 3) Bohr: e- travel around nucleus in a definite orbital
-e- do not fall into the nucleus
*fixed paths are named Energy Levels
->increase level = increase E
->to inc level, you move to the next level = Quantum
->all e- not equally spaced apart or spaced from nucleus ...
think escalator

4) **Quantum Mechanical Model**: *includes models 1, 2, 3*

-math equation to tell the location & E of e-

-estimates probability of e- in certain position

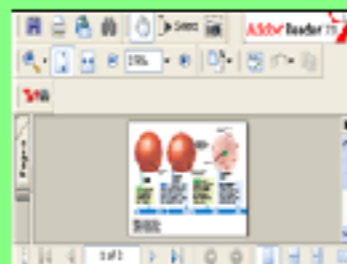
-portrays a “fuzzy cloud” model (when moving)

-> most dense where e- most likely found

***denser around smaller atoms

-specific levels tell location of e-

=> inc level = inc E



Levels & Orientation

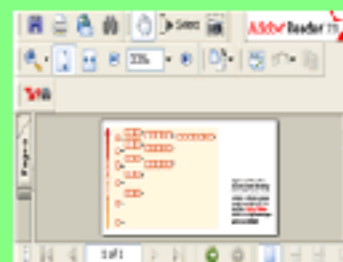
E levels (n) = 1, 2, 3, 4, 5, 6, 7 (rows on PT)

->sublevels = s, p, d, f (specific location & # of e- on PT)

E Levels

Sublevels

Drawing it



*when you inc in E level, you add 1 more sublevel

*E levels 5, 6, 7 can have all spdf sublevels

3 Rules to using e- configuration / orbital notation:

1) Aufbau Principle

-e- enter at lowest E level first

2) Pauli Exclusion Principle

-an atomic orbital may have at most 2 e-

3) Hund's Rule

-when e- occupy orbitals of equal E, 1e- enters each orbital

until all orbitals contain 1e-



Lewis Dot refresher

-> for Group A / Representative Elements (*the peaks*)

A periodic table with color-coded groups. Group A (representative elements) is highlighted in yellow, Group B (transition metals) in blue, and the d-block (transition metals) in red. The lanthanide and actinide series are shown in green at the bottom.

Period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	H	He																
2	Li	Be	B	C	N	O	F	Ne										
3	Na	Mg	Al	Si	P	S	Cl	Ar										
4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Cobalt	Nickel	Cu	Zn	Ga	Ge	As	Se	Br	Kr
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
6	Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
7	Fr	Ra	Ac	Rf	Mn	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn				
Lanthanide																		
Actinide																		

PRACTICE PRACTICE PRACTICE!!!

PRACTICE PRACTICE PRACTICE!!!