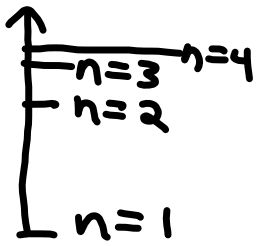
Electron Configuration

Use symbols to show e^- location

- Aufbau (building up)
  * electrons fill lower E levels first (orbitals)

$n = 1, 2, 3, 4 \ldots$

principle E level



$\#e^- = 2n^2$

n	$\#e^-$
1	2
2	8
3	18
4	32
⋮	

Electron sub-levels (orbitals)

E →

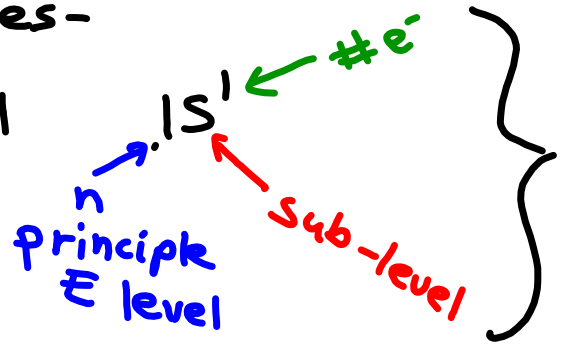
Orbitals	s	p	d	f
	1	3	5	7
$\#e^-$ max.	2	6	10	14

Maximum $2e^-$/orbital

Writing Electron Configuration

Examples-

a) $_1H$ $1s^1$ ground state



b) $_2He - 1s^2$

c) $_3Li - 1s^2 2s^1$

d) $_4Be - 1s^2 2s^2$

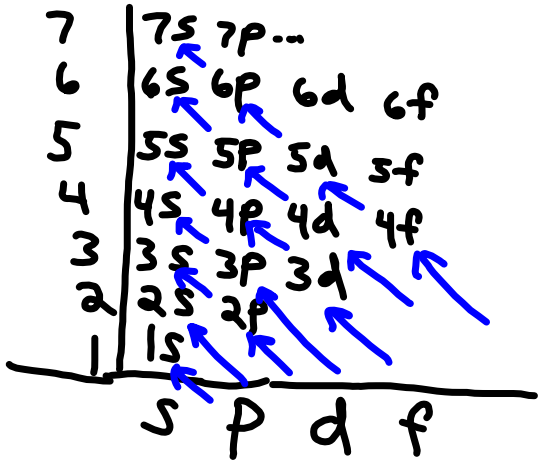
e) $_5B - 1s^2 2s^2 2p^1$

f) $_6C - 1s^2 2s^2 2p^2$

g) $_7N - 1s^2 2s^2 2p^3$

Diagonal Rule

* Used to write e^- configuration for multi-e^- atoms
* Electrons in the atom interact (repel) and orbitals overlap in energy.



Read diagonally ↖

e.g. $_{26}Fe - 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$

$_{51}Sb - 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^3$

short hand $[Kr]\ 5s^2 4d^{10} 5p^3$

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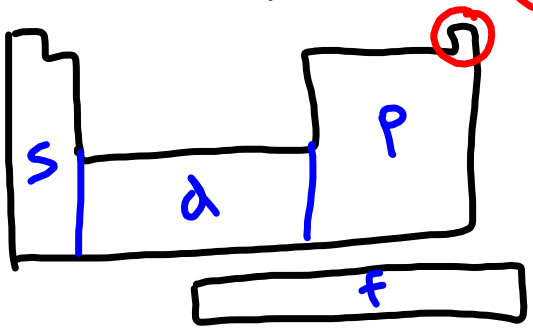
Electron Configuration and the Periodic Table

$_{6}C$ – $1s^2 2s^2 2p^2$

$_{14}Si$ – $1s^2 2s^2 2p^6 3s^2 3p^2$

$_{32}Ge$ – $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^2$ ← predicted

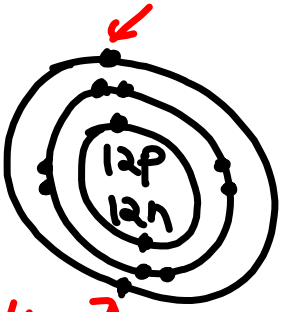


Watch for overlap
"d" – 1
"f" – 2

Valence Electrons

Electrons in the outermost principle E level.

e.g. Mg



$Mg - 1s^2 2s^2 2p^6 3s^2$

valence e^- (2)

- Mg-2+ ion
- Tends to lose $2e^-$

Electron Dot Diagram

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See answer sheet (ch. 5+6)

e.g. H_2 H:H

shared pair