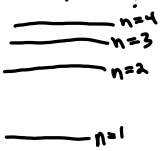
Electron Configuration

- Symbols are used to show e^- location
- Aufbau (building up) or e^- fill lower energy levels first. (orbitals)

$n = 1, 2, 3, 4 \ldots$ ← principle E level



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

n	#e⁻
1	2
2	8
3	18
4	32

Electron Sub-levels (orbitals)

E → s p d f

orbitals 1 3 5 7

2 max e^- 2 6 10 14

Writing Electron Configuration

Bohr e.g. $_1H$ — $1s^1$ ← # e^- (1 = principle E level, s = sub-level) } ground level config.

$_2He$ — $1s^2$

$_3Li$ — $1s^2 2s^1$

$_4Be$ — $1s^2 2s^2$

$_5B$ — $1s^2 2s^2 2p^1$

$_6C$ — $1s^2 2s^2 2p^2$

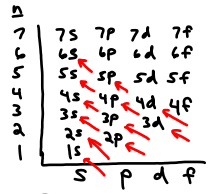
$_7N$ — $1s^2 2s^2 2p^3$

$_{10}Ne$ — $1s^2 2s^2 2p^6$

Chart p.13 $_{11}Na$ — $1s^2 2s^2 2p^6 3s^1$

Diagonal Rule

* This is used to write e^- config. for multi-electron atoms.
* Electrons in the atom interact (repel) and orbitals overlap in energy.
* Slightly different order of filling.



read on diagonal

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

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

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

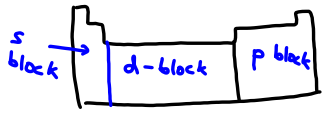
Questions- p.139 #18(a-c), 19-22

Electron Configuration and the Periodic Table

$_6C$ — $1s^2 2s^2 \mathbf{2p^2}$

$_{14}Si$ — $1s^2 2s^2 2p^6 3s^2 \mathbf{3p^2}$

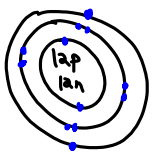
$_{32}Ge$ — $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} \mathbf{4p^2}$ ← lag



Valence Electrons

Valence e^- are in outermost principle E level

e.g. Mg



Mg — $1s^2 2s^2 2p^6 3s^2$ (2) ← valence e^-

Mg tends to lose $2e^-$.

Electron Dot Diagram

$\dot{\underset{\cdot\cdot}{M}}g$ ← Valence e^-, kernel

e.g. H_2 H⊙H

Questions- P.141 #23, 28