

Electron Configuration

Valence electrons Number of electrons in outermost shell.

shell -> subshells -> orbitals

shell K, L, n=1, 2, ...
 M, N

subshell s, p, 1s, 2s, 2p,
 d, f, g 3s, ...

orbital s, p_x , 1s, 2s, 2p $_x$,
 p_y , p_z 2p $_y$, 2p $_z$

Element is classified depending on the orbital filled by the last element as s, p, d and f block element.

Quantitative Reasoning

Mole It is a unit for telling the count, just like dozen. 1 mole = 6.02 x 10²³ units

Standard Temperature and Pressure (STP)

Avagadro's Hypothesis Volume occupied by 1 mole of ideal gas at STP is 22.41 litres

Mass of neutron 1.0087 u

Mass of proton 1.0073 u

Mass of electron 0.00055 u

Periodic Table Groups

Group 1 Alkali Metals Valency +1 ~ium

Group 2 Alkali Earth Metals Valency +2 ~ium

Group 17 Halogens Valency -1 ~ine

Group 18 Inert (Nobel) Gases Valency 0 ~on

Diatomic nonmetals H, Halogens, C, and O

s-block Group 1, 2

p-block Group 13 to 18

d-block Group 3 to 12

Group 1 (Alkali Metals): +1

Hydrogen H 1 (atomic number) 1x=1 u or amu
(Exception: Non-metal)

Lithium Li 3 2x+1=7

Sodium Na 3+8=11 2x+1=23

Potassium K 11+8=19 2x+1=39

Rubidium Rb 19+18=37 2x+1=85

Caesium Cs 37+18=55 2x+23=133

Francium Fr 55+32=87 2x+49=223

Group 2 (Alkali Earth Metals): +2

Beryllium Be 4

Magnesium Mg 4+8=12

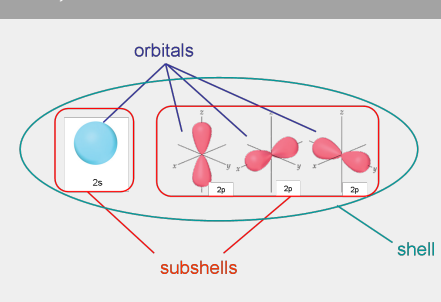
Calcium Ca 12+8=20

Strontium Sr 20+18=38

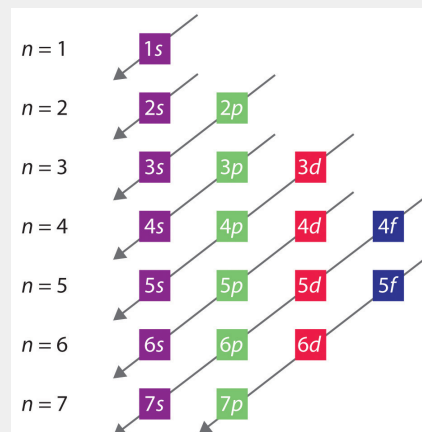
Barium Ba 38+18=56

Radium Ra 56+32=88

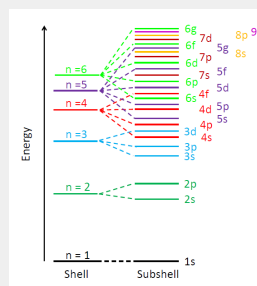
Shell, Subshell and Orbital



Electron Configuration - Filling Shells



Energy levels of Orbitals



Group 17 (Halogens): -1

Fluorine F 9

Chlorine Cl 9+8=17

Bromine Br 17+18=35

Iodine I 35+18=53

Astatine (Exception: Metalloid) At 53+32=85

Ununseptium (Artificial Element) Uus 85+32=117

Group 18 (Inert or Noble Gases): 0

Helium He 2

Neon Ne 2+8=10

Argon Ar 10+8=18

Krypton Kr 18+18=36

Xeon Xe 36+18=54

Radon Rn 54+32=86

Ununoctium Uuo 86+32=118