

### 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 10<sup>23</sup> 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

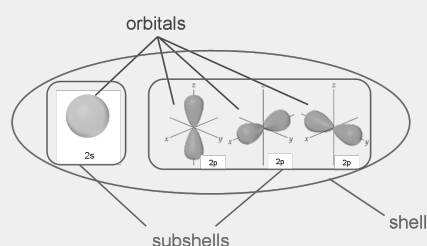
**Calcium**      Ca      12+8=20

Strontium      Sr      20+18=38

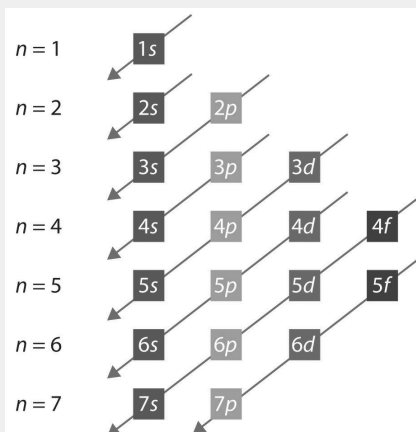
Barium      Ba      38+18=56

Radium      Ra      56+32=88

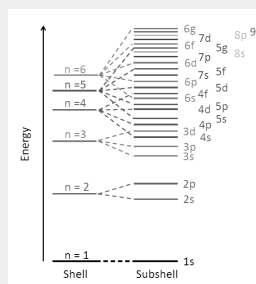
### Shell, Subshell and Orbital



### 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