

INORGANIC CHEMISTRY SUMMARY

* New system → Few aspects from the old.

Emphasis → ⊗ Not the equation

- (a) Periodicity of the atomic properties.
- (b) Physical properties
esp (Melting & Boiling points of elements & compound in the periodic table)
- (c) Chemical equations.
(Chemical properties)
- (d) Transition elements.

⊗ Inorganic analysis

Periodicity of atomic properties.

1. Atomic radius.
2. Ionisation energy.
3. Electron Affinity.
4. Electronegativity.
5. Electropositivity.
6. Metallic character.

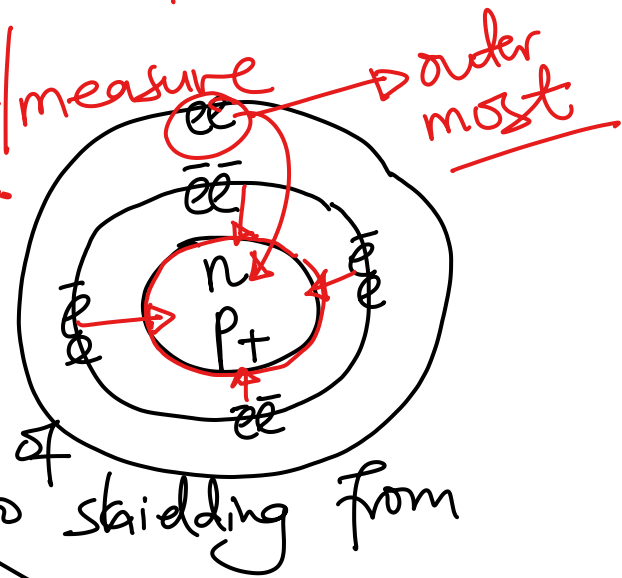
⊗ Similarity in the affecting factors.

✓ What are they?

✓ Vary in the periodic table.

* ✓ Nuclear charge (Z): number/measure of positive charges in nucleus.

* Screening effect (S): no of Protons



Decrease in nuclear attraction of the outermost electrons due to shielding from fully filled inner shells.

* Effective nuclear charge:

Net nuclear attraction

$$E_f = Z - S$$

* Electronic configurations:

Explains abnormalities esp. in Ionisation energy & Electron affinity.

∝ Screening effect ∝ no shells

s, p, d, f .
 Fully filled is s^2, p^6, d^{10}, f^{14}
 Partially filled $\rightarrow s^1, p^3, d^5, f^7$

Thermodynamically stable

Variation in the periodic table.

Atomic no \uparrow es.

order of increasing atomic number.

Nuclear charge increases.

Same no of shells.

Screening effect remains almost constant. (Relatively)

$E \cdot N \cdot C = \underline{\underline{\text{Increases}}}$

GROUPS

Atomic number increase.

\therefore Nuclear charge increases

No of shells (energy levels);

\therefore Screening effect increases.

Increase in s, p outweighs increase

in nuclear charge \therefore

$E \cdot N \cdot C = \underline{\underline{\text{Decreases}}}$.

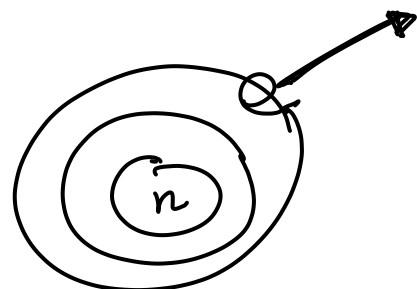
$$E_f = \uparrow Z \text{ (S)} \uparrow$$

① Atomic radius → Describes the size of an atom.

ENC increases; outermost electrons strongly attracted to the nucleus; Period → Atomic radius decreases.

Group → ENC Decreases; outermost electrons are weakly attracted to the nucleus. Atomic radius ↑.

② Ionisation Energy



↳ Describes the amount of energy required to remove an electron from a gaseous atom.

Group ↓ ENC decreases; outermost electron weakly attracted to the nucleus → I.E. Decreases.

Period → ENC increases; Outermost electrons are strongly attracted to the nucleus; I.E. Increases.

③ Electron affinity → Describes the energy change that occurs when a gaseous atom gains an electron.

Energy change → Exothermic (1st E.A)
→ Endothermic (2nd E.A) (onwards)

2nd EA → Electron is added to a region already crowded with electrons; Incoming electron experiences more ~~a~~ repulsion than attraction; Energy must be absorbed to effect the addition.

Period → ENC Increases;

incoming electron is more attracted than repelled; EA ↑.

Group;

ENC Decreases;

Incoming electron experiences greater repulsion than attraction; EA ↓.

④ Electronegativity

Period; ENC ↑; Bonding electrons are strongly attracted to atom; EN ↑.

Group; ENC ↓; Bonding electrons are weakly attracted to the nucleus; EN ↓.

⑤ Electropositivity

Describes the ease of an atom to lose its valence electrons.

Period; ENC ↑; outer most electron strongly attracted; *E.P. ↓

Group (ENC) ↓

Outermost electrons weakly attracted.

E.P. ↑

Metallic character \rightarrow Easy by
which it loses electrons.

Metallic character varies as the
electropositivity.

(b) Variation in melting and Boiling points
of elements & compounds in the
periodic table

