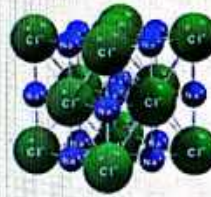
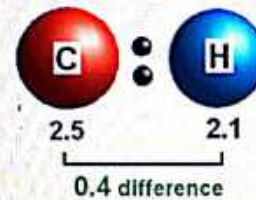


TYPES OF CHEMICAL BONDS

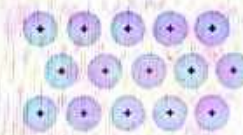
- Ionic bonds



- Covalent bonds



- Metallic bonds



IONIC BOND: FACTORS GOVERNING ITS FORMATION

The formations of ionic bond governed by the following factors:

1. Ionization energy:

- Formation of ionic bond metal atom loses electron to form cation
- Energy required for this equal to ionization energy
- Alkali metals have lowest ionization energy, thus have more tendency to form cation

2. Electron gain enthalpy:

- Electron released in the formation of cation are to be accepted by the other atom taking part in the ionic bond formation
- Electron accepting tendencies depend on upon the electron gain enthalpy
- Defined as energy released when isolated gaseous atom takes up an electron to form anion.
- Greater the negative enthalpy, easier the formation of anion

IONIC BOND: FACTORS GOVERNING ITS FORMATION

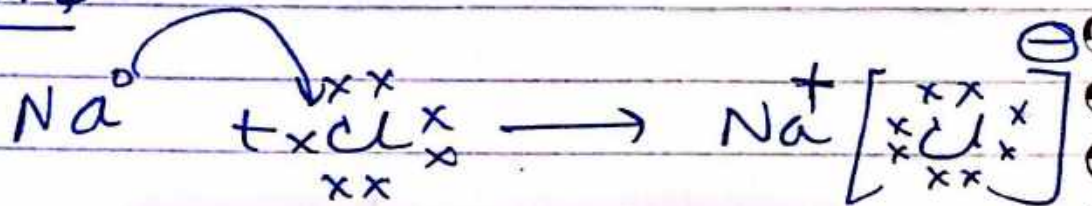
3. Lattice energy:

- Combination of oppositely charged ions to form ionic crystal, with release of energy is referred as lattice energy
- Higher value of lattice energy, greater will be the stability of compound
- Magnitude of lattice energy gives idea about the strength of interionic forces
- **Size of ions:**
 - In case of similar ions inter-nuclear distance is lesser due to which inter-ionic attraction is greater and hence the magnitude of lattice energy will be larger
- **Charge on the ions:**
 - Ions have higher charge exerts stronger forces of attraction and hence larger amount of energy is released. Thus value of lattice energy is higher

IONIC BOND PROPERTIES

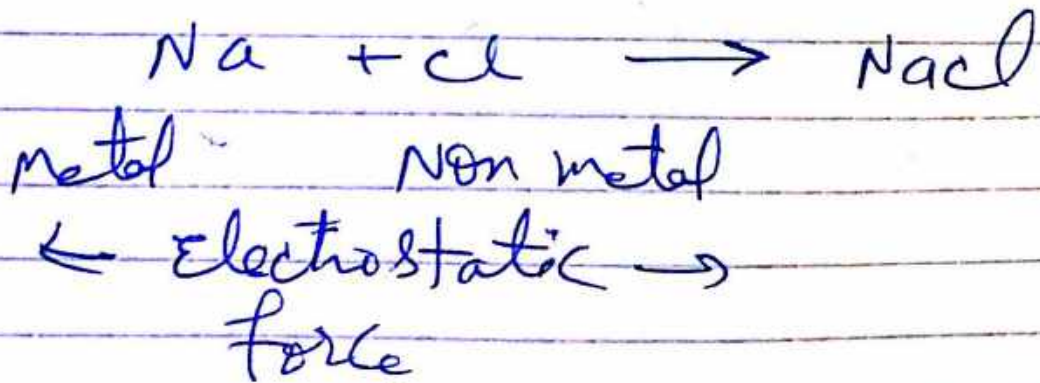
- Ionic compound exist in solid state
- The network of ions have a definite geometric pattern which depends on the size and charge of ions
- Posses high melting and boiling points due to strong electrostatic force of attraction between the ions
- Good conductor of electricity in molten or dissolved state
- Does not conduct electricity in solid state as ions are not free to move
- Are soluble in polar solvent like water as solvent interacts with the ions of ionic solid
- The chemical reactions between ionic compounds in aqueous solution involves the combination between their ions, such reactions are called ionic reactions.

Ionic bond →



~~force~~ electrostatic force of attraction betⁿ (+) & (-) ion.

→ Complete transfer of 1 or more e^{-} from 1 atom to another.



→ E.N. diff (↑) bond strength (↑)

characters of ionic bonding

(1) M.P. & B.P. high

	E.N. diff high	M.P.
$\text{Na}^+ \text{F}^-$		1012
$\text{Na}^+ \text{Cl}^-$		801
$\text{Na}^+ \text{Br}^-$		747
$\text{Na}^+ \text{I}^-$		660
$\text{Ca}^{2+} \text{O}^{2-}$	$\boxed{+2 \& -2}$	2580

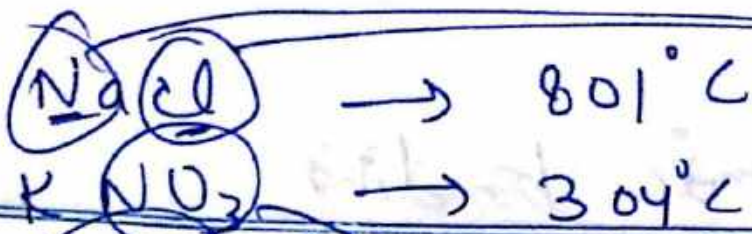
(2) High enthalpies of fusion & vaporization.

Enthalpy of fusion is the amount of heat required to melt one mole of the compd in solid form under constant pressure.

Enthalpy of vaporization is the amt of heat required to vaporize one mole of the compd in liq form under const pressure.

(3) Hard & brittle. M.P. B.P. HBES $\boxed{\text{HBSC}}$

\oplus & \ominus ions are strongly attracted to each other & difficult to separate
Rigid & crystalline.



both ionic
strong force.

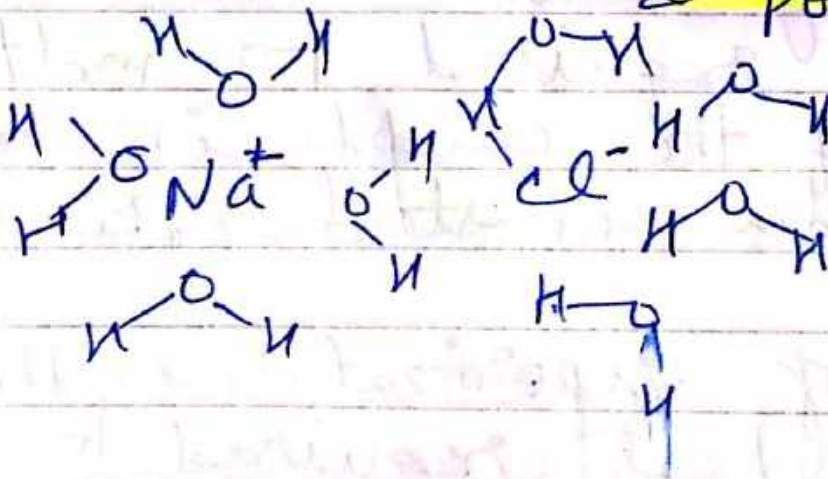


molecular \rightarrow molecular

④ conductivity

Solid \rightarrow poor conductor
liq \rightarrow good conductor

⑤ Solubility \rightarrow ionic compd
soluble in H₂O
& polar solvents.



electrostatic
force of polar
H₂O molecules

Electrostatic
force of Na & Cl