CH5: # Chemical Bonding

Reason: To gain stability and follow

Octet: An atom is stable when it's valance shells has eight electrons e.g Na

Duplet: An atom is stable when its valance shells has two electrons e.g H, Li, Be

E.g: $Be_4 = 1s^2 2s^2$ after losing electrons $Be_4 = (1s^2)^{2+}$

Defination: An attraction b/w two or more atoms to form stable molecules/compo

Force/Bond: Attractive force: Intermolecular

Ionic Bond

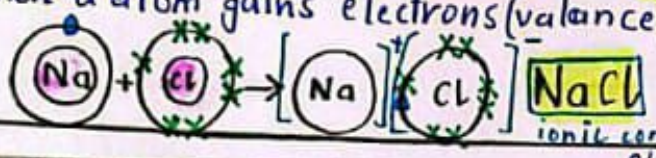
NM + M → electrostatic attraction

Def: A type of bond formed b/w two atoms that trend to lose or gain electrons to become stable.

Formation:

Cation: [electropositive] Metals (low electronegativity, ionization energy) when a atom loses electron (valance)

Anion [electro negative] Non-Metal (high EN and I) when a atom gains electrons (valance)



NaCl

ionic compound

Electrostatic force

COVALENT BOND

NM + NM

— Sharing —

A type of bond formation in which atoms trend to share valance (mutual) electrons to attain stability.

FORMATION:

The electrostatic forre b/w 2 atomic nuclei binds them together.

Types:

Single covalent bond: When one pair of electron is shared

Double covalent bond: When 2 pairs of electrons are shared

Triple covalent bond: When 3 pairs of electrons are shared

Representation: (•) and (—)

Coordinate Covalent bonds

A bond formation in which electron is shared by only one atom (donor) and the other atom accepts that (acceptor).

→ No mutal sharing (unequal sharing) b/w metalions

→ Ex: Ammonium (NH_4) ion

Non

POLAR covalent bond:

- Two similar atoms (H-H, O=O)
- Exert same force
- Atoms which have EN b/w 0-0.4.
- Atoms have similar electronegativities

POLAR covalent bond HCL, where $H^{\delta+}$ & $Cl^{\delta-}$

- Occurs b/w different atoms
- EN b/w 0.4 - 1.8
- Different EN
- one atom becomes slightly (+) and one slightly (-)

METALLIC BOND

Metal + Metal

A bond formation b/w 2 metals that are held together by electrostitic attractive forces b/w cation metal and the negativly charged sea.

Properties due to this Bond:

Melability, Ductility, high melting, boiling point and good conductor of heat and electricity.

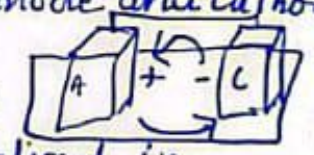
Structure: Giant, solid, less friction, Mellable, ductile, stable, shaped

Conduction of electricity

i) Ionic compounds

When a ionic compound is dissolved in water, the atoms move freely, ready to conduct electricity. in molten ionic compound as anode and cathode.

ii) Acids



When covalent compounds like HCl, H_2SO_4 are dissolved in water, they ionize and form high concentration of H^+ ions and negatively charged particles, thus this ionized acid is ready to conduct electricity.

Allotrope of carbon

Graphite: when carbon is subjected into intense heat and pressure.

Structure: A carbon atom is linked with 3 other carbon atom and is covalently bonded.

Uses: Refactory items, anode in electrolytic proeess, pencil, electric motars.

Diamond: hardest material.

Structure: Carbon atoms are arranged tetrahedrally. Each carbon atom is bonded with 4 other carbon atoms.

Uses: Cutting, drilling, beauty, medicines, Oil equipment, etc.

INTERMOLECULAR FORCE

Between molecules

A attractive force that exist b/w 2 molecules.

Examples

Dipole-Dipole force

When slightly end of (+) polar molecule is weakly attached to slightly end of (-) polar molecule.

Hydrogen Bonding

When (H) is covalently bonded with electronegative atom.

EN more than 1.8

Ionic Bond

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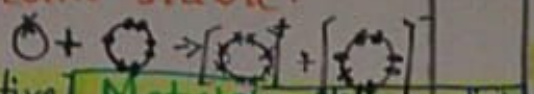

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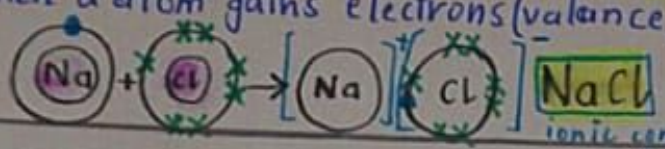

ionic compound

electrostatic force

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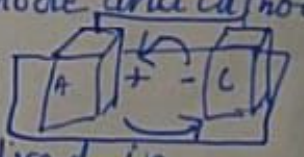

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