

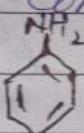
If it contain $C=C$ & $C\equiv C$ multiple bonds are called unsaturated.

iii) Aromatic Compounds:-

→ Benzene and all compound that have structural & chemicals properties resembling benzene are called aromatic Compound.



Benzene



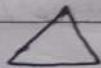
Anilin



Naphthalene

iv) Alicyclic Compound:-

→ Which consist only of C-atoms are called Alicyclic Compound.



cyclo propane



cyclo butane



cyclo Peptane

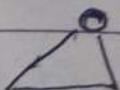


cyclo hexane

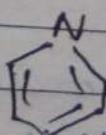
v) Heterocyclic Compound:-

→ It is a compound in which the ring atom of carbon & some other element are called heterocyclic compound.

Eg- Carbon, Oxygen, Nitrogen



Ethylic oxide

Nitrobenzene
Crypline

Structure of atom

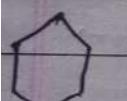
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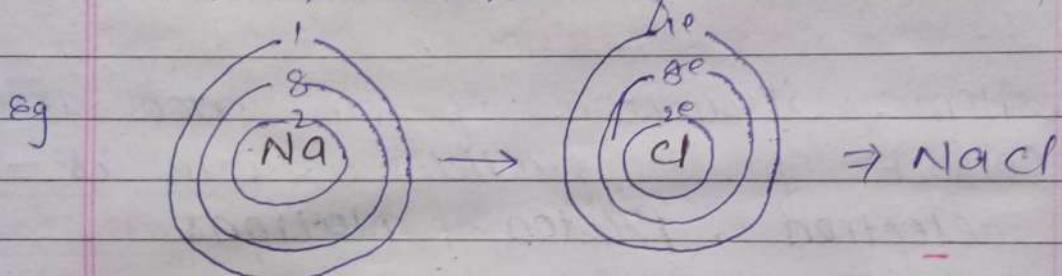
- The atomic structure was 1st described by "John Joseph, thomson" & "Ernest" 1900"
- This model of atom is still used as basis of modern atomic theory.
- Atoms are nothing but building blocks of matter atomic theory: which has mass & takes up space
- Atoms are nothing but building
- All the matter is made up of atom
- The word 'Atom' is obtained from Greek and each individual.
- Atomic Structure of an atom mainly consists of 3 particles such as - electron, proton, Neutrons
- Atoms are particle of elements or, substance these. Cannot be broken further without changing the chemical nature of the substance
- Proton have +ve electric charged and it should be much larger and heavier than electron.
- Neutron have no electric charged and it has much behaviour and larger like proton
- Electron are very small tiny & lighter particles and it has -ve electric charged

Types of Bond:-

- i) Ionic or electrovalent bond
- ii) Co-valent bond
- iii) Co-ordinate bond

i) Ionic or, Electrovalent bond:-

- Ionic bond are formed by transfer of valence e^- from one atom to another. Excess electron than the other.
- This type of bond unites two atoms one of which has excess electron than the stable no (2 or, 8) and the other is short of electrons.



ii) Co-valent Bond:-

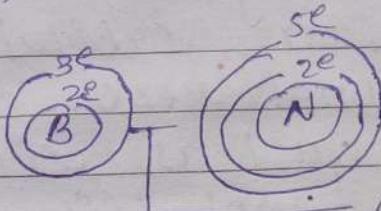
- Co-valent bond are formed by mutual sharing of electron this type of bond unites two atom both of which are short of e^- the two atoms contributed one electron each and then share the resulting pair of electron.

Eg - Hydrogen H H

iii) Co-ordinate bond

- Co-ordinate bond is also formed by mutual sharing of electron but in this case the two electron ~~but~~ that

are shared come from the same atom



co-ordinate bond.

16/11/21

* Atomic orbital :-

The three dimensional region or shape that is volume around the nucleus of an atom where probability of finding electron having a certain energy is maximum (90 - 95%) is called atomic orbitals.

* Orbit :-

As postulated by Bohr's an orbit is a definite circular path at a diff't distance from the nucleus in which the electron revolves around the nucleus to which the orbit are numbered as 1, 2, 3, 4 - from the nucleus and are designated by the Capital letter K, L, M, N ... etc

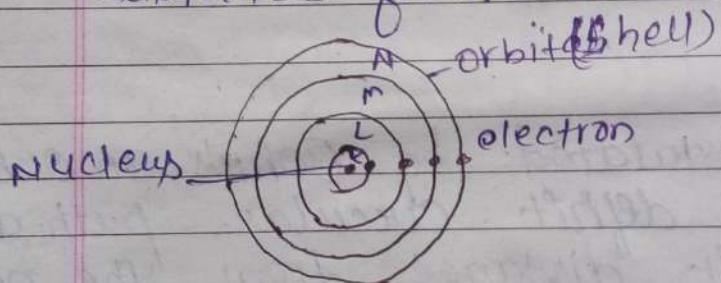
→ An orbit indicates and exact position / location of an electron in an atom

e.g - According to Bohr's theory an electron of hydrogen is found at the distance of 0.53 \AA from the nucleus.

Orbital:-

As postulated by wave nature of an electron an orbital is defined as 3-dimensional region or space around the nucleus within which the possibility / probability of finding an electron with a certain energy is maximum

- An orbital does not specify the definite exact position of an electron in an atom because the electron due to its wave nature can not be found at a fixed distance from the nucleus



St. of Bohr's atomic model

~~18/11/21~~

Molecular Orbital

- The goal of molecular orbital to describe molecules in a similar way to how we describe atoms that is in terms of orbital
- Orbital diagram and electronic configuration

→ Molecules can share 1, 2 or 3 pairs of electrons

→ Sing bond -1
Double bond -2

Triple bond -3

iii) Other type of bonds are formed by charge atoms that is ionic and metal (metallic atom)

Orbital mixing :-

- when atoms share electrons to form a bond their atomic ~~that~~ ^{orbital}s mixed to form molecular bond in order for these orbital to mix they must
 - i) Have similar energy level
 - ii) overlap well
 - iii) well closed together

Molecular orbital Theory (MOT)

- Atomic orbital mixed together and make
 - i) Bonding orbitals
 - electrons in this orbitals hold help hold atom near each other.
 - ii) Antibonding orbitals
 - electrons in this orbital push atom apart from each other.

Non bonding orbital (like lone pair)

- electron in this orbitals have no effect on bonding
- Molecular orbital can
 - be sigma(σ) O_2 , $\text{P}_i(\pi)$
 - be spread over multiple atoms

Principle of molecular orbital theory

- In molecules atomic orbital combine to form molecular orbitals which surround the molecules

- (a) Bonding $\text{O}_2 \rightarrow \text{O} \cdot \text{O}$ Bonding
 (b) Antibonding $\text{O}_2 \rightarrow \text{O} \parallel \text{O}$

→ Molecular bonds have lower potential energy than in separate atomic orbitals.

→ Thus electrons prefer to stay in a molecular bond.

- Equal no. of orbitals
- Order of energy
- Atomic orbitals, a like energy
- Following both the Pauli exclusion principle and Hund's rules
- * σ Bond (Sigma)

→ They are symmetrical about the axis.

- * π Bond (Pi)

→ The $\pi(\pi)$ bonding bonds as a side to side overlap which then causes their density above the and below the axis.

25/11/12) 1. Hybrid orbitals

The strength of equivalent bond stems from the exchange of electrons b/w two atoms.

- The magnitude of this exchange energy is proportional to the amount of the overlap of atomic orbital structure constituting the bond.
- ^{max overlap of} ^{orbital structure} Atomic bond result will result in the strongest bond consequently the bond formed by a given orbital