

CHEMISTRY STUDY MATERIALS FOR CLASS 10

(NCERT Based notes of Chapter -04)

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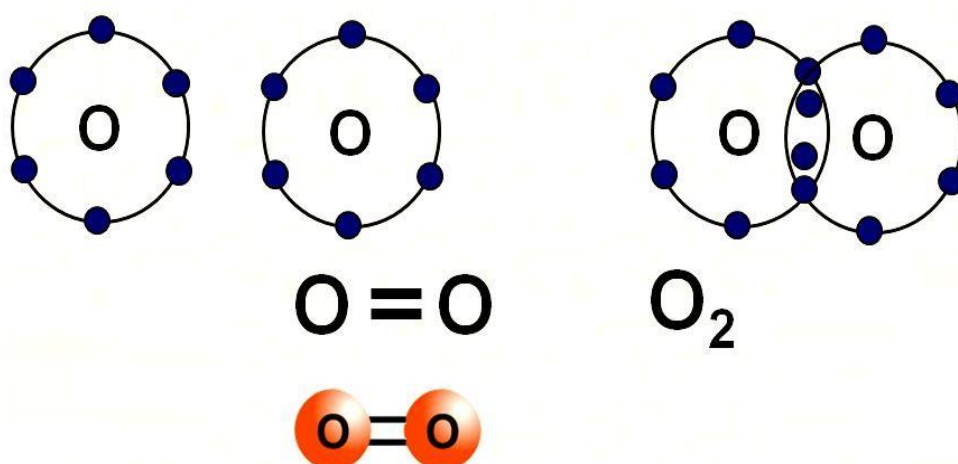
CARBON AND ITS COMPOUND

DOUBLE COVALENT BOND

1. Double covalent bond is the type of covalent bond formed through the **sharing of two pairs of electrons between two non-metal atoms.**
2. Examples of molecules which have double covalent bonds are oxygen, O₂, and carbon dioxide, CO₂.
3. During the formation of double bond, each **non-metal atom contributes two pairs of electrons to be shared** to achieve a **stable electron arrangement.**

Formation of oxygen molecule (O₂):

Valence electron of oxygen = 2

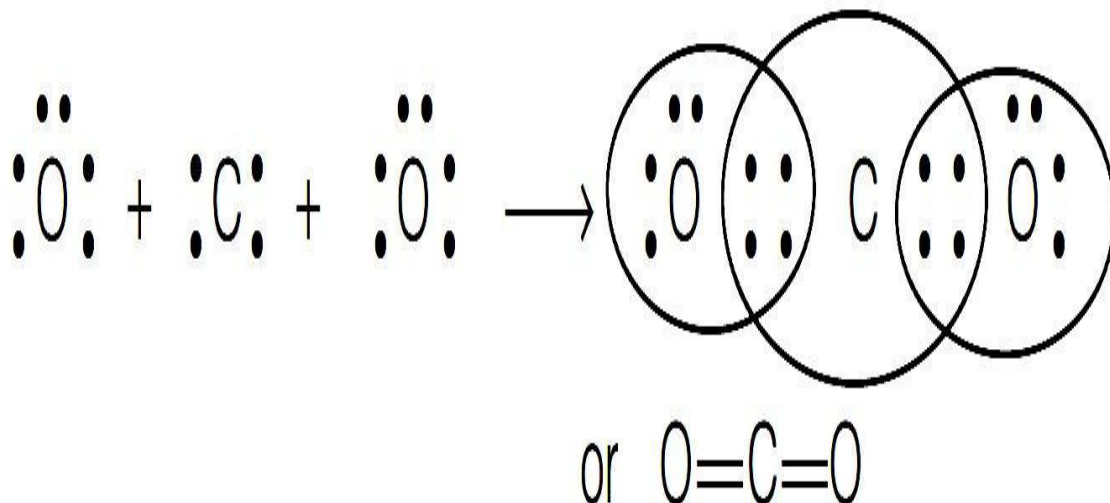


- In the formation of oxygen molecule, two electrons are shared by each of the two oxygen atoms to complete their stable configuration.
- In oxygen, the total number of shared electrons is four, two from each of the oxygen atoms. So a double covalent bond is formed.

Formation of Carbon dioxide (CO₂):

Valence electron of carbon = 4

Valence electron of oxygen = 6

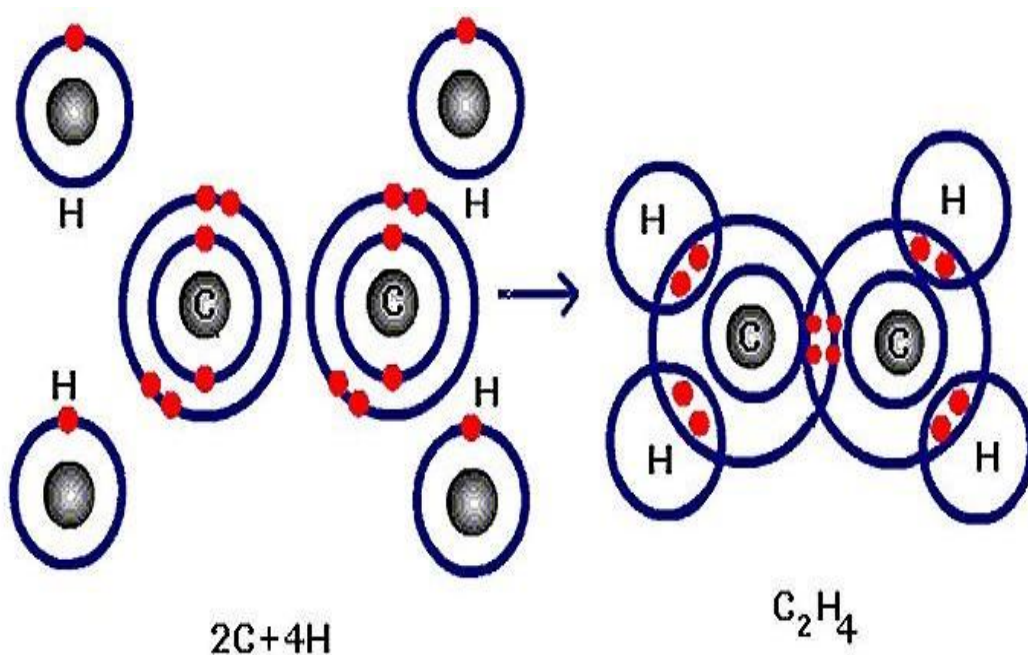


In carbon dioxide two double covalent bonds are formed.

Formation of Ethylene (C₂H₄):

Valence electron of carbon = 4

Valence electron of hydrogen = 1



TRIPLE COVALENT BOND

1. The triple covalent bond is the type of covalent bond formed through the **sharing of three pairs of electrons between two non-metal atoms.**
2. Example of molecule which has triple covalent bonds is the nitrogen molecule, N_2 .

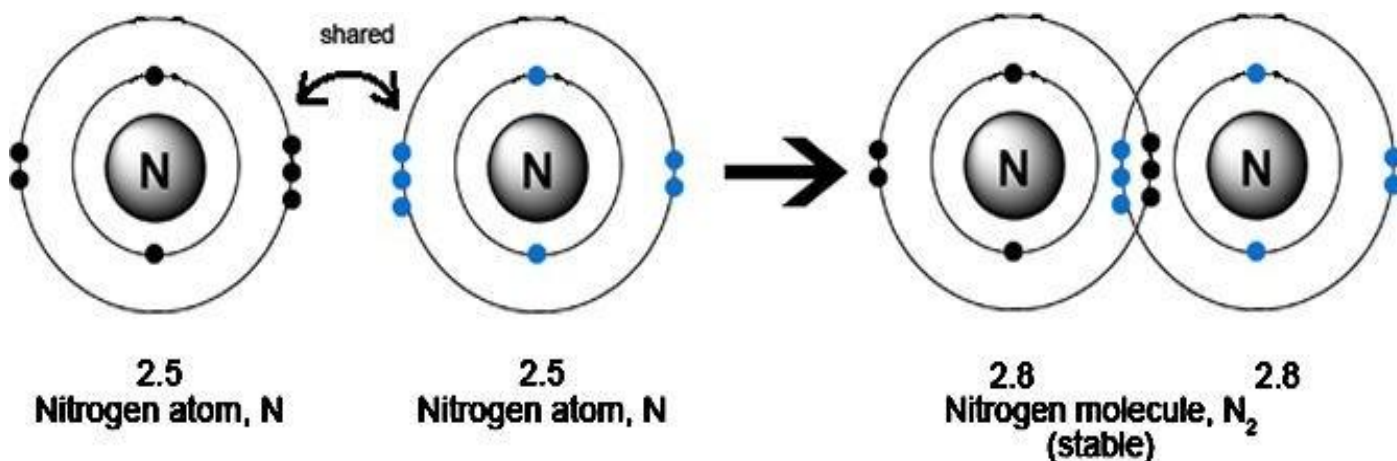
Formation of Nitrogen (N_2):

Atomic number of nitrogen = 7

Electronic configuration of nitrogen = 2, 5

Valence electron = 5

In the formation of nitrogen, three electrons are shared by each of the nitrogen



atoms. Thus one triple bond is formed because of the sharing of total six electrons.

Properties of Covalent Bond:

- Intermolecular force is smaller.
- Covalent bonds are weaker than ionic bond. As a result, covalent compounds have low melting and boiling points.
- Covalent compounds are poor conductor of electricity as no charged particles are formed in covalent bond.
- Since, carbon compounds are formed by the formation of covalent bond, so carbon compounds generally have low melting and boiling points and are poor conductor of electricity.
