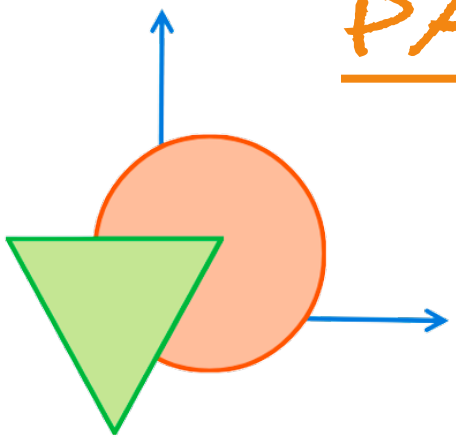
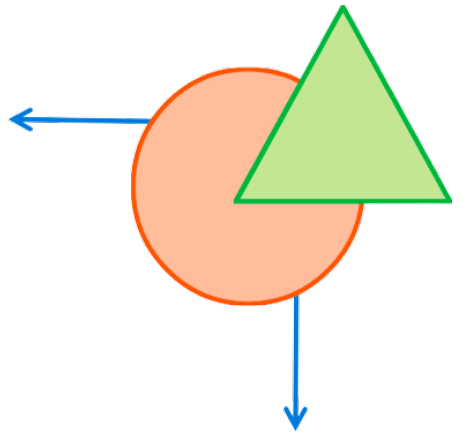
CLASS 10- SCIENCE

CHAPTER 4- CARBON AND ITS COMPOUNDS

PART 3- VERSATILE NATURE OF CARBON



INTRODUCTION

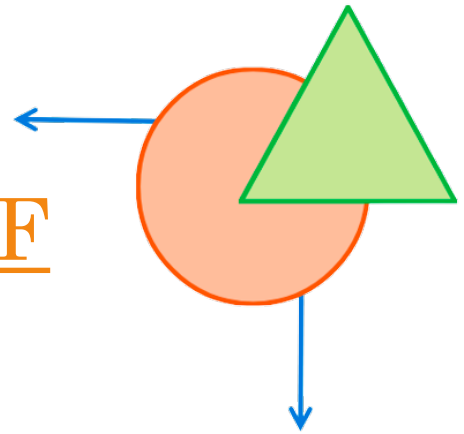


- Organic compounds are made up of carbon, oxygen, hydrogen and some other elements.

- The distinct nature of carbon atom and its capacity to form bonds with other atoms leads to such a huge number of organic compounds.

- Carbon is a versatile element because it can form single, double and triple bonds. It can also form chains, branched chains and rings when connected to other carbon atoms.

REASONS FOR THE VERSATILE NATURE OF CARBON-

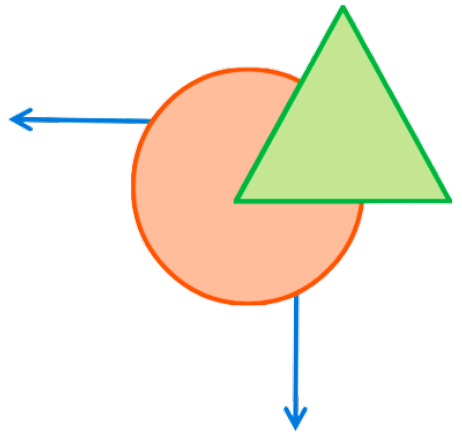


1) Catenation- The self linking property of an element due to which its atoms join with one another to form long chains is called catenation.

- Carbon can link with other carbon atoms through single, double or triple covalent bonds.

- Carbon compounds formed by catenation property are much more stable which leads to the formation of long straight chains, branched chains, and closed rings, thus giving rise to a large number of carbon compounds.

WHY CARBON EXHIBITS CATENATION ?

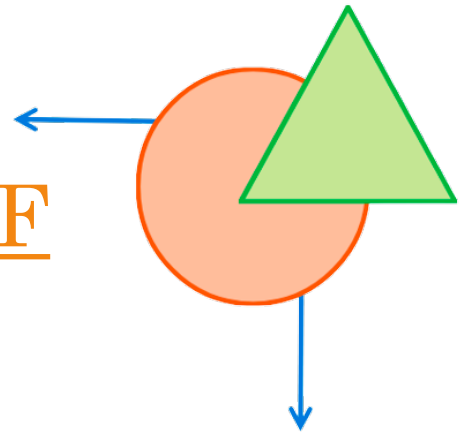


- Size- The size of carbon atom is very small which enables the nucleus to hold the shared pair of electrons firmly thus forming much stronger bonds between the elements.

- Strength- The compounds formed are more stable due to great strength of carbon-carbon bond.

- Formation of multiple bonds- Carbon is capable of forming single, double, or triple bonds with itself and also with atoms of other elements.

REASONS FOR THE VERSATILE NATURE OF CARBON (contd.)

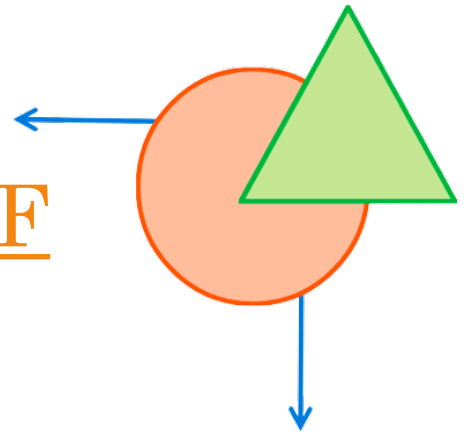


2) Tetravalency-

- Carbon has a valency of four which means that it is capable of bonding with four other atoms of carbon or atoms of some other mono-valent element.

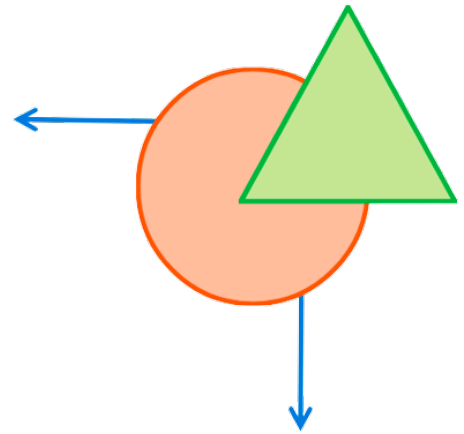
- Compounds of carbon can be formed with oxygen, nitrogen, hydrogen, sulphur, chlorine and many other elements giving rise to compounds with specific properties which depend on the elements other than carbon present in the molecule.

REASONS FOR THE VERSATILE NATURE OF CARBON (contd.)



3) Isomerism-

- Carbon compounds show isomerism with compounds having the same molecular formula but different chemical structures.
- Structural isomerism is mainly seen in the carbon compounds because of the varied arrangements in the carbon atoms.
- For example, two isomers of butane, three isomers of pentane etc.



THANK YOU