

## Isomerism:-

Two or more compounds having same molecular formula and molecular mass but different physical and chemical properties are called isomers and the phenomenon is known as isomerism.

The relative position of different atoms or groups in these isomers is different and that causes the difference in properties. Isomerism may be classified into types:

- 1) Structural Isomerism
- 2) Stereoisomerism

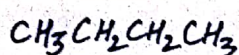
### Structural Isomerism

Compounds having same molecular formula but different structures i.e. different arrangement of atoms within the molecule are called structural isomers and the phenomenon is called structural isomerism.

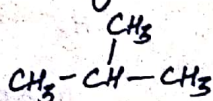
These are further classified as:

#### 1) Chain Isomers:-

Compounds having same molecular formula, differ in the structure of Carbon chain. (Arrangement of chains)



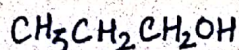
n-Butane



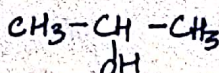
Isobutane

#### 2) Position Isomers

Compounds with same molecular formula have same Carbon skeleton but differ in the position of substituent or functional group; these are known as position isomers.



1-propanol

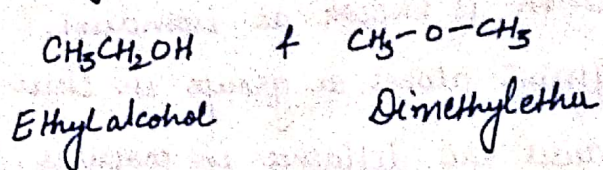


2-propanol



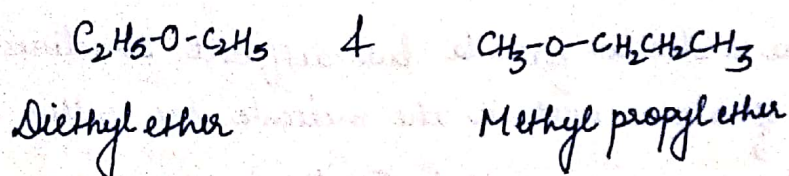
### Functional Isomers:-

Different Compounds, with same molecular formula but different functional groups are known as functional isomers.



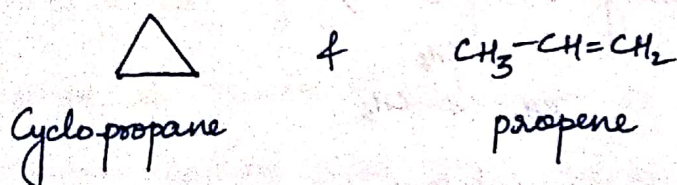
### Metamers

Compounds having same molecular formula, but different no. of carbon atoms on either side of functional group (differ in distribution of alkyl groups around a central atom).



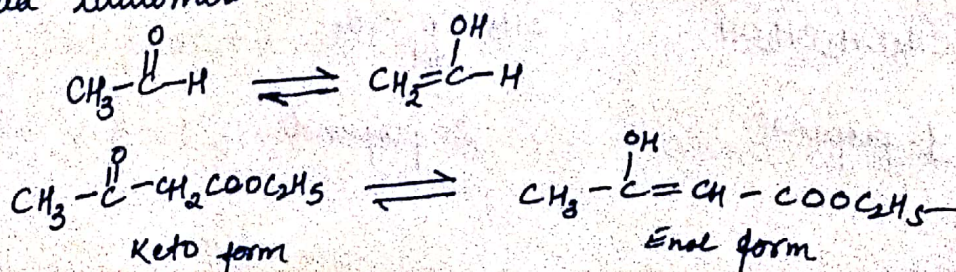
### Ring Chain Isomers

Compounds having same molecular formula but possessing open chain and cyclic structures are called ring chain isomers.



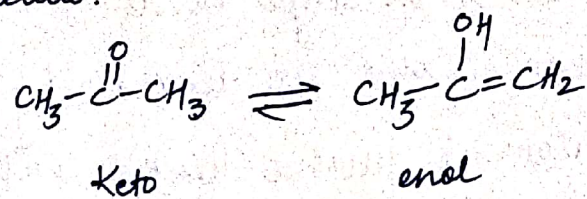
### Tautomers

Compounds whose structures differ in the arrangement of atoms but which exist simultaneously in dynamic equilibrium with each other are called tautomers.





Tautomerism arises due to 1,3 migration of a hydrogen atom from one polyvalent atom to other (electronegative atom) within the same molecule.



## Stereoisomerism

Isomers have structural formula, have same bond connectivity but different arrangement of groups or atoms in space are termed as stereoisomers and the phenomenon is known as stereoisomerism.

### (i) Conformational isomers:-

Stereoisomers which differ in the relative position of some of the atoms in the molecule in three dimensional space due to rotation about sigma bonds are called conformational isomers. The interconversion of these isomers does not require breaking or remaking of covalent bonds.

A Conformation is particular orientation or arrangement of atoms in a molecule differing from other possible orientation by rotation around single bond.

### (ii) Configurational Isomers

Stereoisomers arise due to some sort of rigidity within the molecule which can be interconverted only by breaking or remaking of covalent bonds and not by rotation about sigma bonds are called configurational isomers.

A Configuration is fixed spatial arrangement of atoms in the molecule.