

Isomeric Properties of Organic Compounds

Sheeraz Khan Rasheedy

Assistant Prof., Sayed Jamaluddin Afghani University, Faculty of Education, Department of Chemistry

ABSTRACT: Organic compounds have different linear and branched elaborate formulas, so if two organic compounds with the same molecular formulas and different elaborate formulas are called isomers of each other. The same but differs in structural formula and physical properties is called isomerism and the phenomenon is called isomerism. Spectroscopic research has shown that the chemical and physical Properties change and new materials emerge with new properties, but the change in the position of the bonds within a molecule only causes a change in the physical properties and leads to the formation of isomers.

KEYWORDS: Confirmation, Configuration, Stereoisomer, Structural Isomer.

GOALS

- Identify the cause of the increase in organic compounds
- The difference between molecular structure and description structure.

INTRODUCTION

Organic compounds whose molecular formulas are the same and whose definite formulas differ are called isomers of each other. They are similar but differ in structural formula and physical properties. These phenomena are called isomers and this phenomenon is called isomerism. Spectroscopic studies have shown that Chemical and physical properties change and new materials are formed with new properties, but the change in the position of the bonds within a molecule only causes a change in the physical properties and leads to the formation of isomers.[4]

TYPES OF ISOMERS

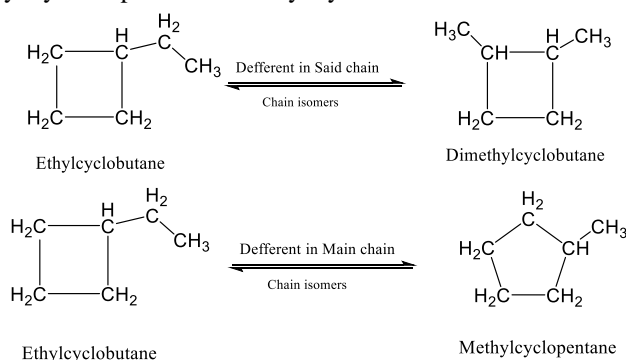
Isomer have different types depending on their characteristics.fo ease of study,isimers are generally divided into structural isomers and stereotypic isomers.

1- Structural isomers:

Compounds that have similar molecular formulas but differ in structural formulas and properties are called structural isomers. Structural isomers have a number of types, which we will study below.[5]

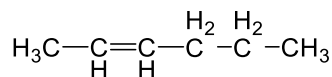
A: Chained isomers:

Compounds that have the same molecular formulas and molecular weights but differ in structural or structural formulas. Isobutan is a chain isomer and methyl cyclone pentane and ethyl cyclobutan are isomer chain isomers.[1]

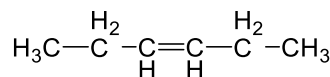


B. Positional isomers:

Compounds that have the same molecular formula and molecular observations but differ in their structural formula by changing the position of alternating, functional groups, double and triple bonds are called positional isomers.[2]



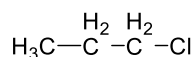
2-Hexene



3-Hexene

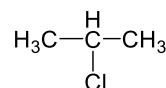
C. Functional isomers:

Isomers are molecular formulas and molecular weights that have the same but different functional groups and have similar chemical and physical properties. Functional isomers. These isomers are called organic compounds. They vary by family or belong to different families, such as in different families of esters and acids. The following examples are functional isomers of each other.[1]



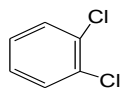
n-Propylchloride

1-Chloropropane

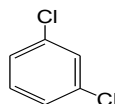


Iso Propylchloride

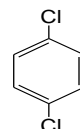
2-Chloropropane



1,2-dichlorobenzene
Ortho Chlorobenzene



1,3 Di Chlorobenzene
Meta Chlorobenzene

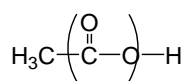


1,4 Di chlorobenzene
Para Chlorobenzene

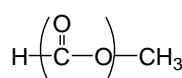
D. Metamer Isomers:

Compounds that have the same molecular formula and molecular weights but differ in the number of carbon atoms on either side of the functional group are called metamorphosis isomers and this process is called metamorphism. The following examples of aldehydes and ketones are isomer metamorphoses.[4]

In my opinion, these explanations and examples are not suitable for metamer isomers because we have explained this in functional isomers and positional isomers. If the chains on one side are different, then the compounds are isomers of the other metamorphosis. The two may be different. As can be seen in the following example, the chains on either side of the oxygen and nitrogen atoms are different.



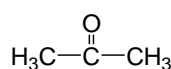
Organic Acid Family
Acetic Acid



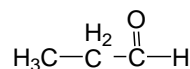
Ester Family
Methyl formate

E. Tautomers:

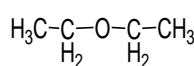
Molecules whose structure is in equilibrium with each other, like isometry, but whose interaction and functional groups change during interaction are called tautomers. In other words, two distinct structures of a molecule formed by the effect of resonance. Below are the keto-enol-tautomer molecules, which have changed one proton and one contact point.[6]



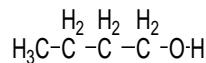
Ketone



Aldehyde



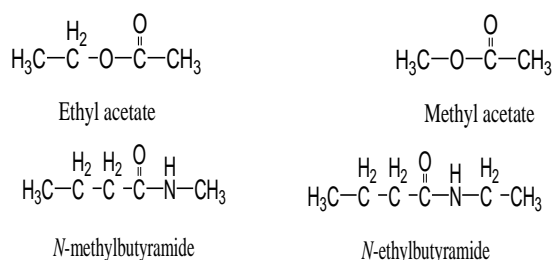
Ether



Alchole

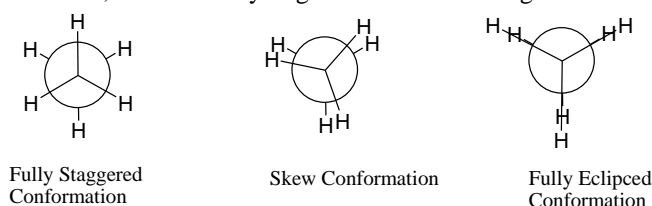
2-Stereo isomers:

Compounds that have similar molecular formulas and molecular weights but have different radical locations differ in the atmosphere structure in the environment of the two interactions. Stereo isomers are in turn divided into conformation and configuration, as we shall see below.[3]



A: Conformation:

Such isomers are not real isomers and are not obtained at room temperature. The hydrogen atoms and alkyl groups in the alkano molecule move freely around the axis of the C-C bond, resulting in different shapes of the alkano molecule. This arrangement of atomic and alkyl groups formed as a result of rotational motion on a C-C bond is called conformation and the conformation isomer of a single molecule is called a conformer.[7] Or Rotations Isomer, abbreviated as Rota mere. The etymological conformation of a molecule can be shown by the following model. In the ethanol molecule, all three hydrogens of each carbon must assume a position by free-rotating motion in relation to C-C, including two extreme conformation. Staggered and eclipsed, it is worth noting that in addition to these two extreme conformations, there is a very large intermediate configuration called skew or gauche confirmation.[1]



B. Configuration:

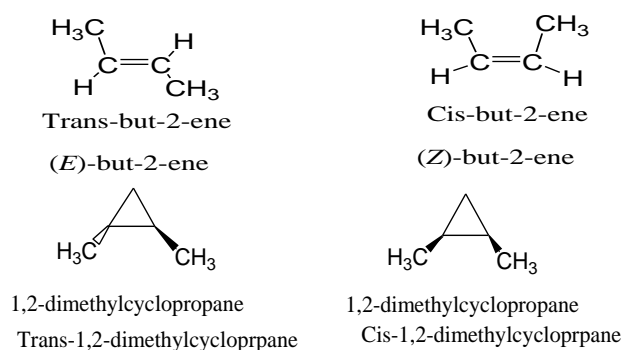
Such isomers are real isomers and are obtained at room temperature. They are divided into two parts according to the configuration structure and properties, namely geometric isomers and optical isomers.

a) Geometrical Isomer's:

He tells the isomers that the double relationships of the compounds vary depending on the position of the radicals around them. Two different terms are used for geometric isomers.

Cis: This term is used when the double relation of a compound to the adjacent carbon is a kind of substitution on one side.

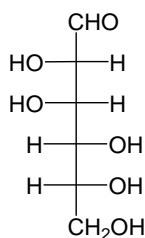
Trans: This term is used when the double relation of a compound to the adjacent carbons is a kind of substitution of one to the other.[7]





b) Optical isomers:

Another type of space isomer, the sequence of atoms of a molecule formed in space on the left and right, causes the optical isomer and is now being discussed. They are called compounds and they are called energy-efficient activities. Compounds containing asymmetric carbon have other functionalities such as manose and other sugars.[3]



2,3,4,5,6-pentahydroxyhexanal

D-Monose

CONCLUSION

The number of organic compounds is said to be more than two and a half million. The presence of triple, triple and unilateral bonds, as well as the saturated and unsaturated carbon sequestration, are phenomena that lead to a relative increase in organic compounds.

REFERENCES

1. Agawal, Dr. o.p. 2008, Text Book of organic chemistry, 5th Edition Disha Publication, Delhi, p.59.
2. Bahl, Arun, B.S. Bahl, Advance Organic Chemistry, p.117.
3. Nasipuri stereochemistry of organic Chemistry 2011, (principle and applications) 3rd Edition, p.30-35.
4. Walizi, Gul Hassan, (9th ed.), Organic Chemistry (Elephantics), Kabul, Afghanistan Times Press.
5. Hakimi, Dr. Mohammad Ghous. Organic chemistry. Kabul Publications Saeed, 4.
6. Mamond, Dr. Khair Mohammad. Dictionary of Chemistry. Germany Afghanistan Broadcasting Society, 4 H.
7. Hope, decree, organic chemistry. Mahin Kharndwia Society, 4 H.