

13.3 ISOMERISM IN ORGANIC CHEMISTRY- SQs

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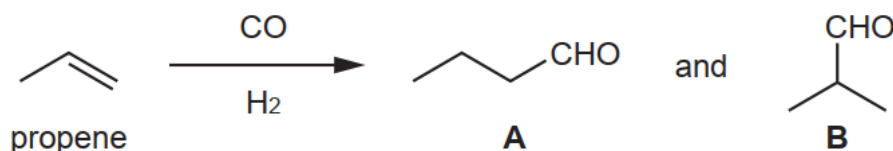
13.4 Definition and classification of isomerism

1. Define isomerism.

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13.5 Structural isomerism and its types: chain isomerism, position isomerism, functional isomerism, metamerism and tautomerism

2. Write a short note on: Structural isomerism in organic compounds. 5
3. Write a short note on: Structural isomerism in organic compounds. 2
4. Write the isomers of C_4H_{10} and give their IUPAC names. 2
5. Alkenes undergo an addition reaction with a 1:1 mixture of CO and H_2 to form aldehydes. Fig. 3.1 shows the reaction of propene with a 1:1 mixture of CO and H_2 .



Aldehydes **A** and **B** are structural isomers.

- (i) State the type of structural isomerism shown by **A** and **B**. [1]
 - (ii) Name **A**.
6. Draw the structure of a molecule that is a positional isomer of **C** and **D**. [1]



7. Write short notes on the isomers of C_6H_{10} . 5
8. Give a functional isomer of C_3H_7OH and write its IUPAC name. 2
Write down the functional isomers of $CH_3-CH_2-CH_2-OH$ and give the IUPAC name. 2
9. *Write down the functional isomer of Propanol and give its IUPAC name.* 1
10. *Write down the functional isomers of CH_3-CH_2-OH and give IUPAC name.* 2
Write the isomers of C_2H_6O and give their IUPAC names. 2
Write down the functional isomer of methoxymethane and give its IUPAC name. 1
11. Give the functional isomer of ethanoic acid with the structural formula. 1
Write down the functional isomer of methyl methanoate and give its IUPAC name. 1
12. Write down the functional isomer of propanoic acid and give its IUPAC name. 2
13. Write down the functional isomers of CH_3-CH_2-COOH and give the IUPAC name. 1
Give possible isomers of $C_3H_6O_2$ and write their IUPAC names. 2
14. Write down two structural isomers and their IUPAC names of C_3H_6O . 2
Give the functional isomer of propanone with the structural formula. 1
15. Give possible isomers of C_3H_6O and write their IUPAC names. 2
16. Write the IUPAC name and structure for the possible compound with formula C_3H_6O . 1

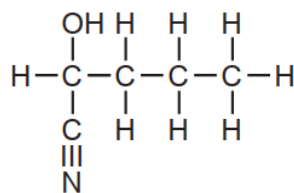
13.6 Concept of geometrical isomerism & optical isomerism

17. Draw the two stereoisomers of but-2-ene.

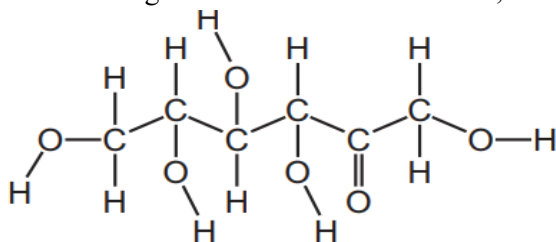
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18. C is a chiral molecule.

Circle any chiral centres in the structure of C shown in Fig. 3.2.



19. On the diagram of the fructose molecule, label all the chiral centres with an asterisk (*).



20. The amino acid serine, $\text{HOCH}_2\text{CH}(\text{NH}_2)\text{COOH}$, exists in two optically active forms. These optical isomers, isomer P and isomer Q, are shown in Fig. 8.1.



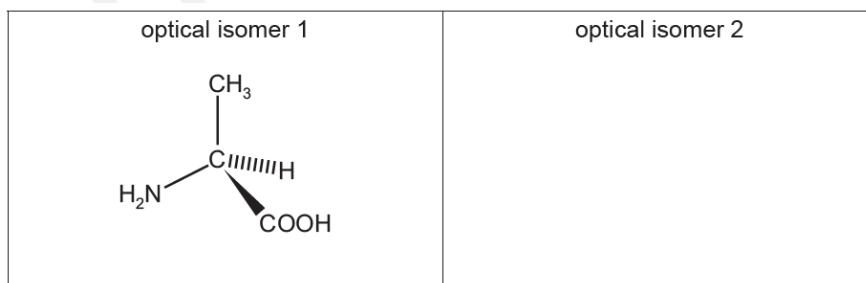
Isomer P and isomer Q have identical physical and chemical properties, except for two specific properties. One of these two properties is their differing effect on plane-polarised light.

(i) A solution of pure isomer P of a particular concentration rotates plane-polarised light by 5.0° in a clockwise direction.

Describe how a solution of pure isomer Q of the same concentration affects plane-polarised light. [1]

(ii) State another term, in addition to stereoisomers, optical isomers and non-superimposable mirror images, which can be used to describe this pair of chiral compounds, isomer P and isomer Q. [1]

21. Alanine exists as a pair of optical isomers. The structure of one optical isomer is shown in Fig. Draw the three-dimensional structure of the other optical isomer of alanine. [1]



22. The structure of compound **P** is shown in Fig. 7.1.

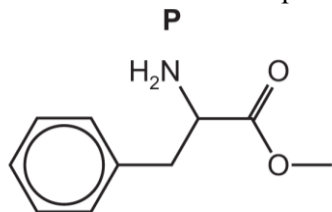


Fig. 7.1

(i) **P** is optically active.

Use an asterisk (*) to identify all chiral carbon atoms on the structure of **P** in Fig. 7.1.

[1]

(ii) Plane-polarised light is passed through a pure sample of one enantiomer of **P**. This is then repeated with a pure sample of the other enantiomer of **P**.

Describe the results of these two experiments, stating the similarities and differences of the results.

23. Cortisone is an optically active molecule.

- i. Explain what is meant by optically active.
- ii. Explain what is meant by the term chiral centre.
- iii. Define enantiomers.

[1]

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