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M.Sc. Sem. I

C.C. III

Organic Chemistry

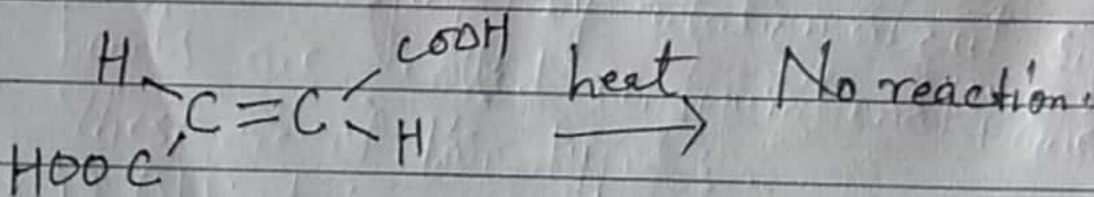
Stereochemistry

- Dr. Manju Kumari

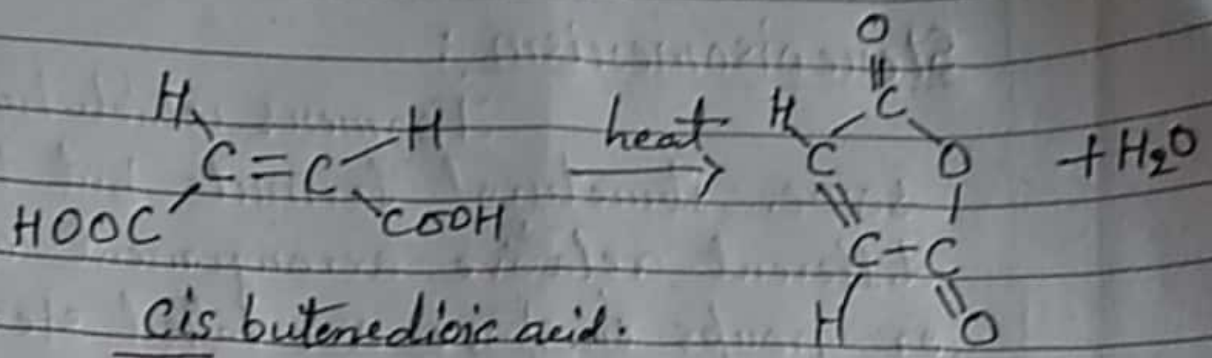
Introduction

Stereochemistry is the study of the three dimensional structure of molecules. The cis and trans isomers are forms of stereoisomers, differing structurally only in the location of the atoms of the molecule in three dimensional space. Such stereoisomers can have different physical and chemical properties.

e.g., cis and trans isomers of butenedioic acid show vast differences in their physical and chemical properties.



trans butenedioic acid



Cis butenedioic acid.

butene dioic anhydride.

It is of two types :

1. Structural isomerism.
2. Stereoisomerism.

Structural isomerism : compounds having

the same molecular formula but different structures.

It is of the following six types :

- (i) Chain isomerism.
- (ii) Position "
- (iii) Functional "
- (iv) Metamerism
- (v) Tautomerism
- (vi) Ring-chain isomerism.

## Stereoisomerism :

Isomers which have the same structural formula but have different relative arrangement of atoms or groups in space are called stereoisomers and the phenomenon is called stereoisomerism.

It is of two types :

- (i) Conformational isomers
- (ii) Configurational isomers.

(i) Conformational isomers : Stereoisomers which differ in the relative position of atoms ~~with~~ within the molecule and which can be interconverted simply by rotation about sigma bonds are called conformational isomers.

(ii) Configurational isomers : Stereoisomers which can be interconverted only by breaking and remaking of covalent bonds and not simply by rotation about sigma bonds are called configurational isomers.

These are of two types :

- (i) Optical isomerism
- (ii) Geometrical isomerism

To be continued...