

STEREOCHEMISTRY 1.

Geometrical Isomerism Continued.

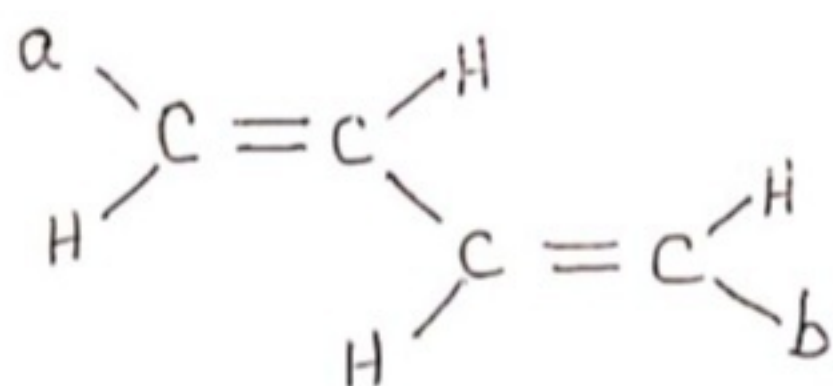
Degree-II (Hons.), Paper-IV, Group-B

By- Dr.Rinky ,Dept. of Chemistry, Date -20-07-2020

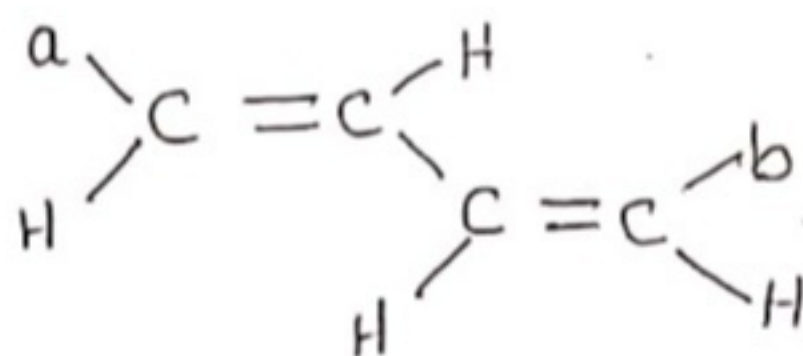
When a compound contains 'n' number of dissimilarly substituted double bonds, the no. of Geometrical isomers = 2^n

For example :- in the following example

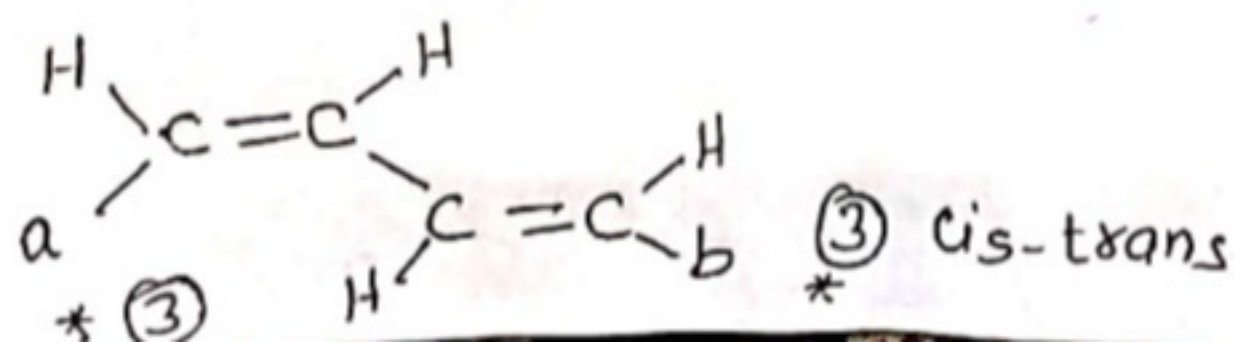
$$n = 2 \quad \therefore \text{No. of geometrical isomer} = 2^2 = 4$$



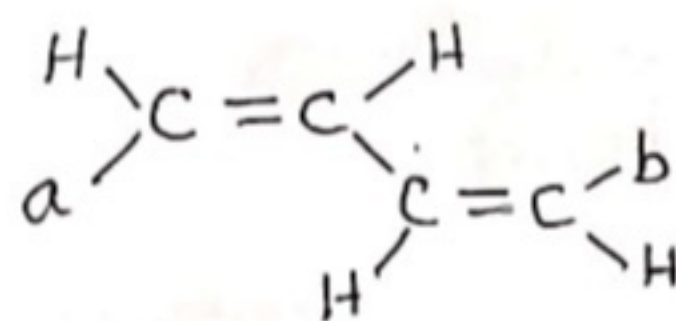
① trans-trans



② trans-cis

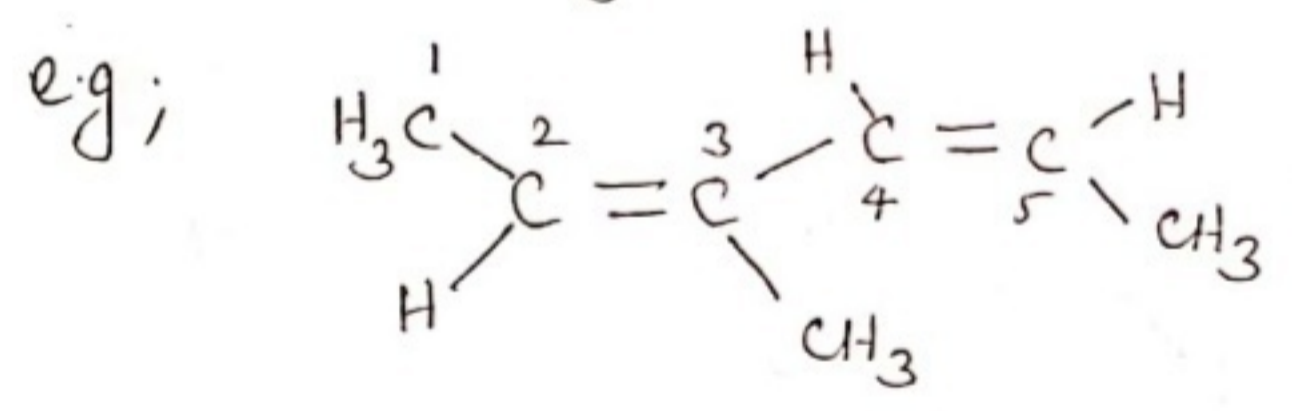


③ cis-trans



④ cis-cis

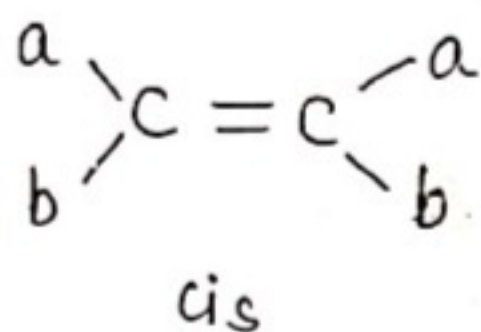
- * If some of the double bonds are identically substituted, the no. of geometrical isomers is diminished, e.g. in the back example when $a=b$, then the no. of geometrical isomers becomes three.
- * Such a geometrical isomers are named as derivatives of the longest carbon chains containing maximum no. of double bonds.
- * The prefixes cis- and trans- are then placed before the number indicating the position of the double bonds.



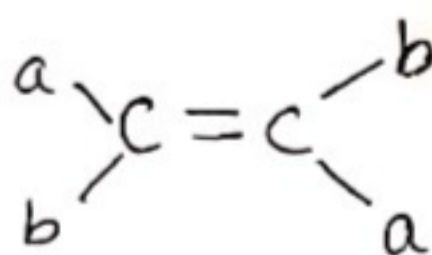
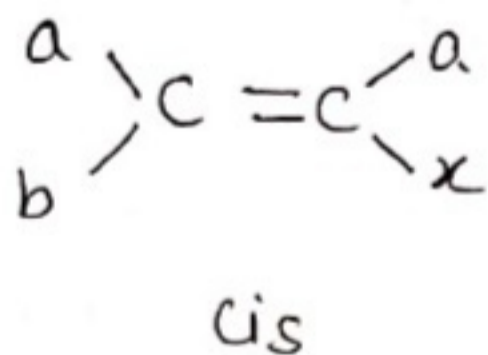
Name :- 3-methylhexa-cis-2-cis-4-diene.

E and Z Nomenclature Of Geometrical Isomers

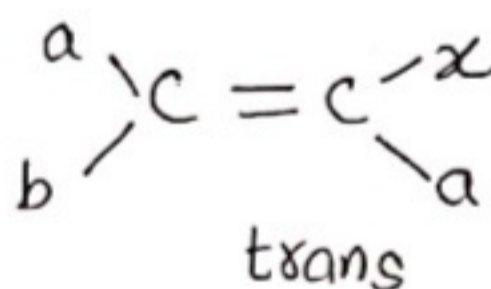
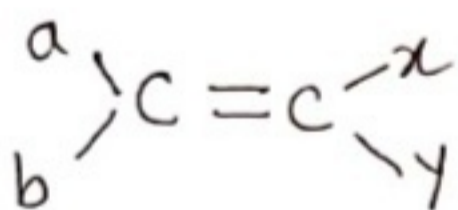
The geometrical isomerism is possible in structure of the following three types: — —

Type-1

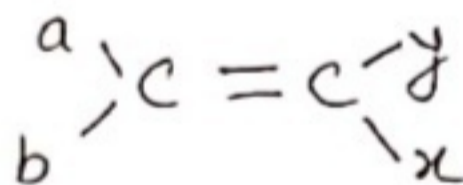
and

Type-2

and

Type-3

and



* In the first two types, the geometrical isomers are labelled as cis and trans on the basis of the fact that the common groups are on the same or opposite sides of the double bond.

* But in the type-3 where all the four substituents are different, cis-trans type of isomerism can not be applied.

* For such type of isomer, E-Z system of nomenclature is applied.

* This E-Z system of nomenclature is based on the sequence rules of Cahn, Ingold and Prelog for naming optical isomers on the R-S system.

Continued..