

Chemistry 2.5

Organic Chemistry

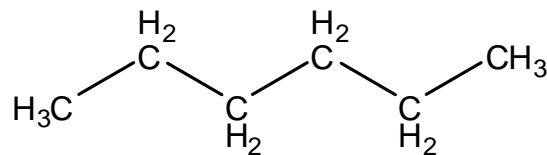
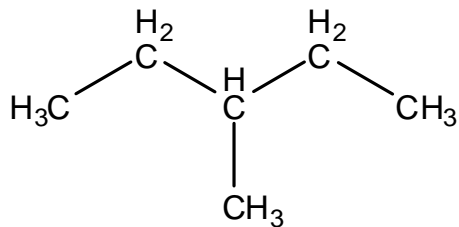
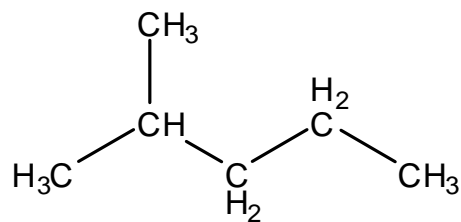
Isomerism

Isomers

- Isomers are molecules that has the same composition but **arranged differently** either by **different bonding order** or **different position in space**
- There are two types of isomers
 - Structural isomers- different bonding order
 - Stereo-isomers- different position in space
 - Geometric isomers
 - Optical isomers (level 3)

Structural isomers

- Molecules which have the **same atom composition** (molecular formula) but atoms are arranged in **different order** (structural formula).
- Example

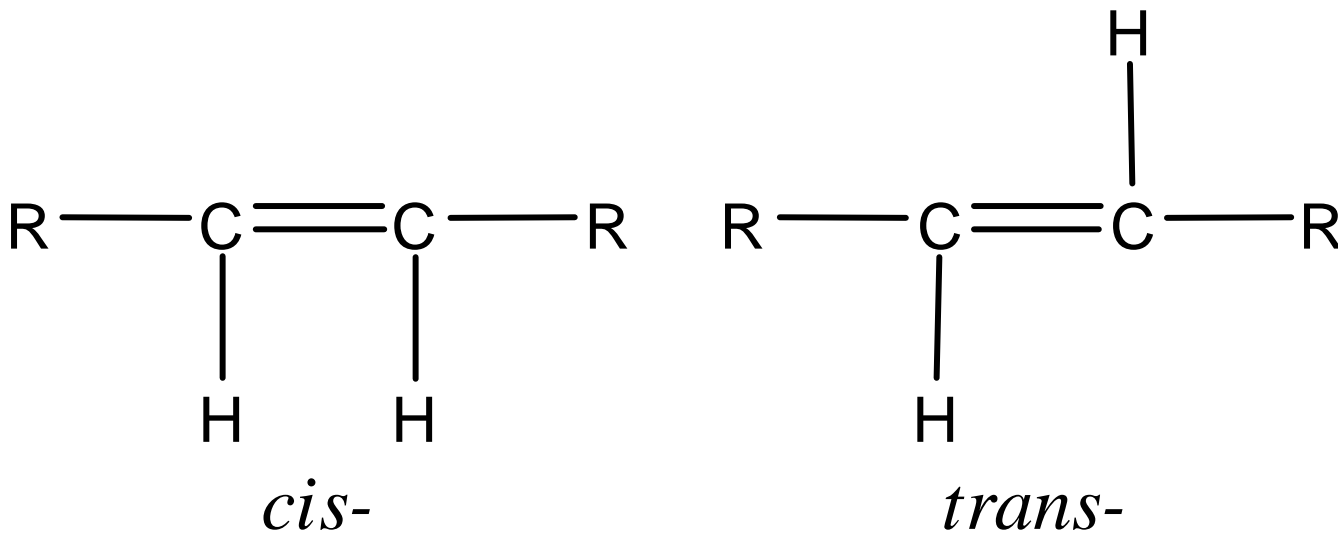


Stereo-isomers

- Molecules have the **same atoms to atoms arrangement** but **different positions in space**.
- Their **condensed structural formulae** will be the **same** but their **structural formulae** will be **different**.
- There are two forms of stereoisomers
 - Geometric (*cis- and trans*)
 - Optical (*level 3*)

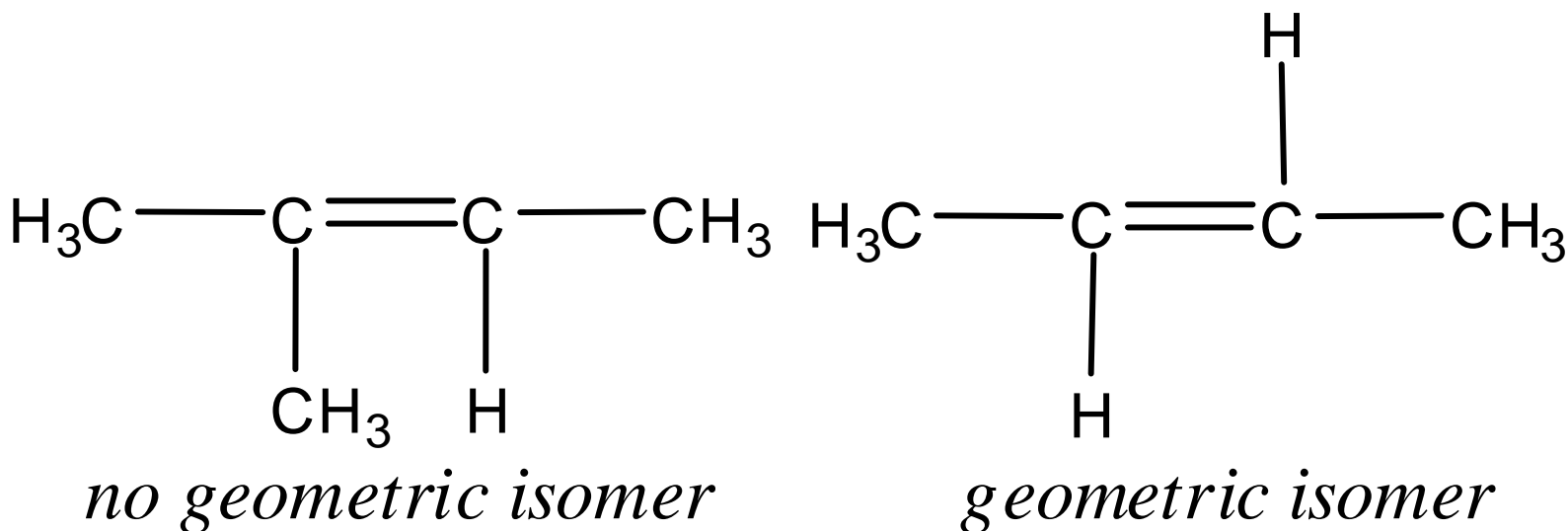
Geometric isomers

- Also called *cis-trans*- isomers, are caused by the **rigidity** of the double bond in alkene.



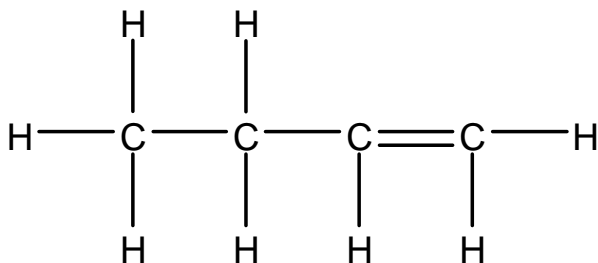
Geometric isomers requirements

- The compound must have a C=C double bond.
- Each carbon of the double bond must have two different groups attached to it.



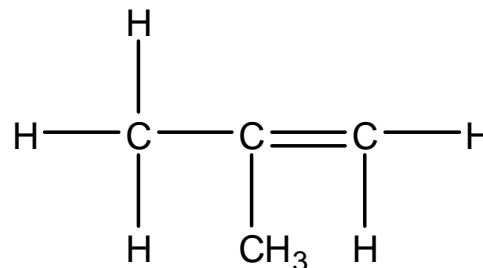
Example

- All the possible structural isomer of C_4H_8



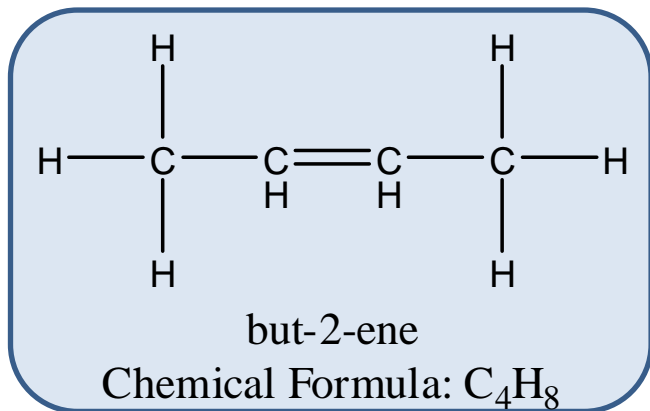
but-1-ene

Chemical Formula: C_4H_8



2-methylprop-1-ene

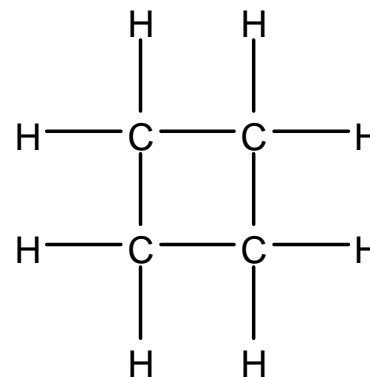
Chemical Formula: C_4H_8



but-2-ene

Chemical Formula: C_4H_8

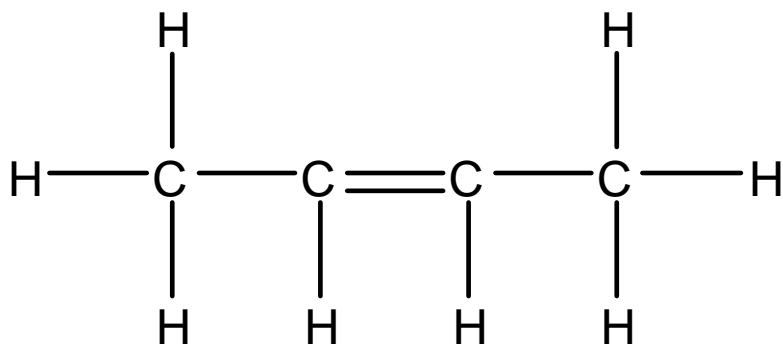
Able to have
geometric isomers



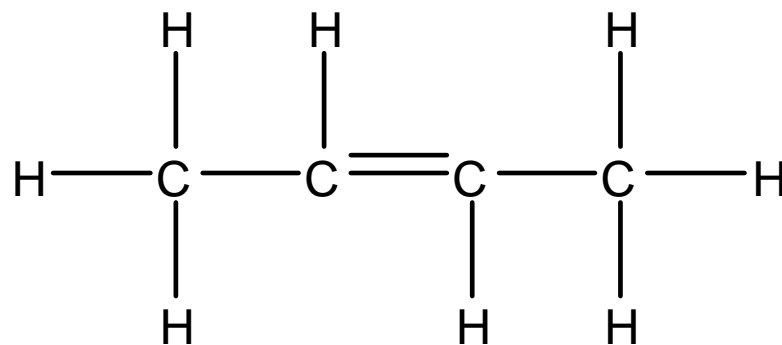
cyclobutane

Chemical Formula: C_4H_8

Geometric isomer of C₄H₈



cis but-2-ene



trans but-2-ene