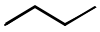
A BRIEF REVIEW OF ISOMERISM

There are two major classes of isomers: Constitutional Isomers and Stereoisomers.

1. Constitutional Isomers – different connectivity between atoms:

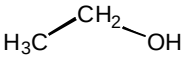
a. With different carbon skeletons:

Isobutane

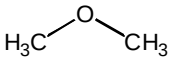


Butane

b. With different functional groups:



Ethyl Alcohol



Diethyl Ether

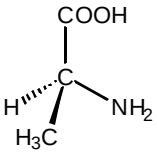
c. With a different position of the functional groups:

Propylamine

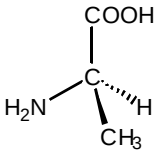
Isopropylamine

2. Stereoisomers – same connectivity between atoms, but different spatial orientation:

a. ***Enantiomers*** – nonsuperimposable mirror-image stereoisomers:



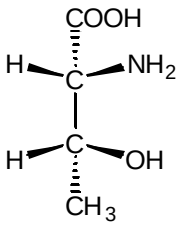
(S)-Alanine



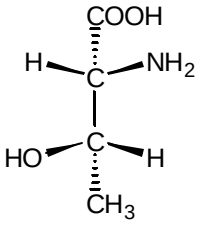
(R)-Alanine

b. ***Diastereomers*** – nonsuperimposable non-mirror-image stereoisomers:

1) Configurational Diastereomers:

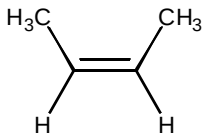


(2R,3R)-2-Amino-3-hydroxybutanoic Acid

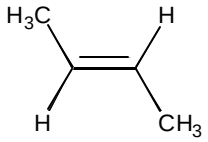


(2R,3S)-2-Amino-3-hydroxybutanoic Acid

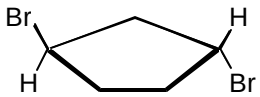
2) *Cis-Trans* Diastereomers – substituents on same side or opposite sides of a double bond or a ring:



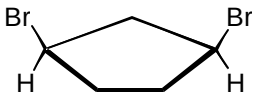
cis-2-butene



trans-2-butene



trans-1,3-Dibromocyclopentane



cis-1,3-Dibromocyclopentane