CONCEPT: ORGANIC CHEMISTRY

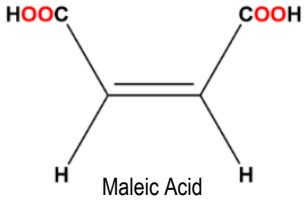
●*Organic chemistry* focuses on the structure, properties & reactions of _____-containing compounds.

□ Carbon makes up about 62% of the dry weight of the human body, showing its importance to life.

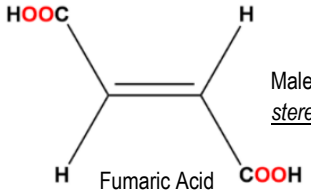
●*Stereochemistry* refers to the spatial _____ arrangement of atoms/molecules.

●_____: same atomic composition, different spatial 3D arrangement.

EXAMPLE:



Maleic Acid
(***Cis*** configuration)



Fumaric Acid
(***Trans*** configuration)

Maleic acid & fumaric acid are *stereoisomers* to one another.

Configurations & Conformations

●Stereochemistry considers both a molecule's *configuration* & possible *conformations*.

□ *Configuration*: a _____ 3D arrangement (only changed by breaking/reforming bonds).

□ *Conformations*: potentially_____ 3D arrangements.

●_____ _____: a carbon in a molecule *bounded to four distinct chemical groups*.

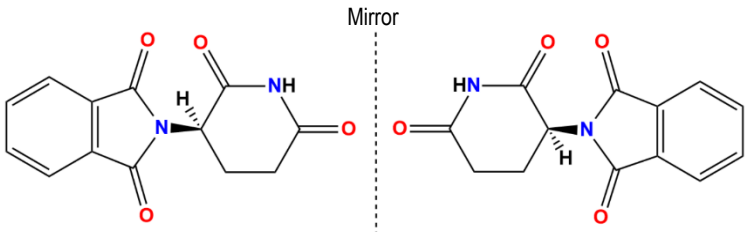
□ A chiral center can have one of two possible configurations (___ or ___).

●_____: same chiral molecules with opposite chiral configurations.

□ Enantiomers are *nonsuperimposable* mirror images that differ in chemical properties.

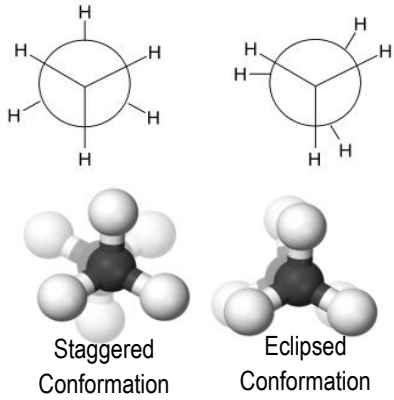
EXAMPLE: Label the configurations of the enantiomers below:

Chiral Configurations



____-Thalidomide ____-Thalidomide

Ethane Conformations



Staggered Conformation

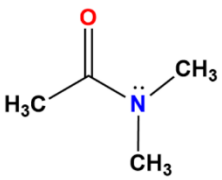
Eclipsed Conformation

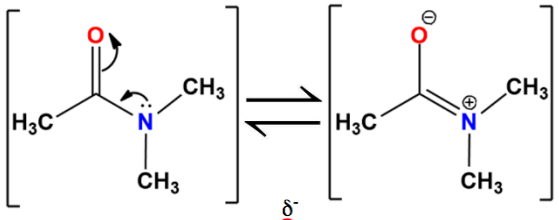
Resonance

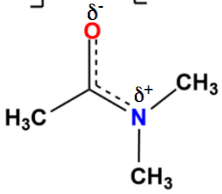
●*Resonance* is the _____ of electrons within a molecule and has an energy stabilizing effect.

●Separate resonance structures are *not* actual transient states of the molecule & a _____ is the best representation.

EXAMPLE:

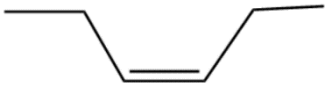


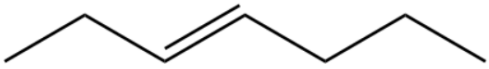




CONCEPT: ORGANIC CHEMISTRY

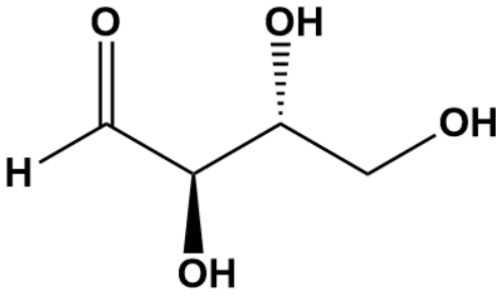
PRACTICE: Determine the configuration of the following alkenes:

A) 

B) 

PRACTICE: A) Identify the chirality centers in the molecule.

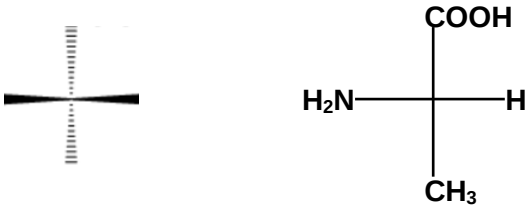
B) Determine the configuration of each chirality center.



Fischer Projections

- _____ Projections: a molecular drawing style used commonly to portray chiral compounds.
  - □ Horizontal bonds are all popping out of the page as _____.
  - □ Vertical bonds are all going into the page as _____.

EXAMPLE: Determine the R/S configuration of each chirality center in the Fischer projection below.



PRACTICE: Determine the R/S configuration of each chirality center in the Fischer projection below.