

Isomerization Vocabulary

Chem12A, Organic Chemistry I

Isomer: same chemical formula but different structure

- **Constitutional:** different bonding (different IUPAC names)
- **Stereoisomers:** different spatial arrangements
 - **Conformational/Conformers:** rotation around single bonds
 - **Configurational:** “locked” rotation, cannot interconvert
 - **Cis/Trans or Z/E:** arrangement around a “locked” bond (π -bond or ring)
 - **Enantiomers:** Non-superimposable mirror image
 - **Diastereomer:** contains an asymmetric center but has a superimposable mirror image
 - **Meso:** diastereomers that include an internal plane of symmetry

Use cis (same)/trans (opposite) OR Z (same)/E (opposite) for alkenes and cyclic structures.

Stereocenter: a carbon whose groups' orientation causes E/Z or R/S isomers

Asymmetric Center: an sp^3 -carbon with four different groups attached

Chirality: “handedness”, mirror images

- **Chiral:** has a nonsuperimposable mirror image (enantiomer)
- **Achiral:** has a superimposable mirror image (no enantiomer)

Use R (clockwise)/S (counterclockwise) to indicate stereochemistry (spatial arrangement).

- **Levorotatory (-):** rotates polarized light counterclockwise
- **Dextrorotatory (+):** rotates polarized light clockwise

Threo: substituents are on opposite sides of the carbon chain

Erythro: substituents are on the same side of the carbon chain

Racemic: mixture of both R and S isomers