Stereochemistry and Chirality

Chiral object or molecule: has a non-superimposable mirror image *Achiral* object: not chiral, has a superimposable mirror image

Resolution - Separation of right and left-handed forms (enantiomers)

Enantiomers: molecules that are stereoisomers and are non-superimposable mirror images of each other. Physical properties of enantiomers are the same, as far as they are measured in an achiral environment. A chiral agent of molecule is necessary to distinguish them.

Diastereomers: stereoisomers that are not enantiomers.



Example 1:



NON-SUPERIMPOSABLE \rightarrow Enantiomers

Example 2:



Identical structures, superimposable





- enantiomers

- dashed circle is stereogenic center carbon atom

Example 4:



If there is <u>plane of symmetry</u> within a molecule, then the molecule is **achiral** (not chiral)