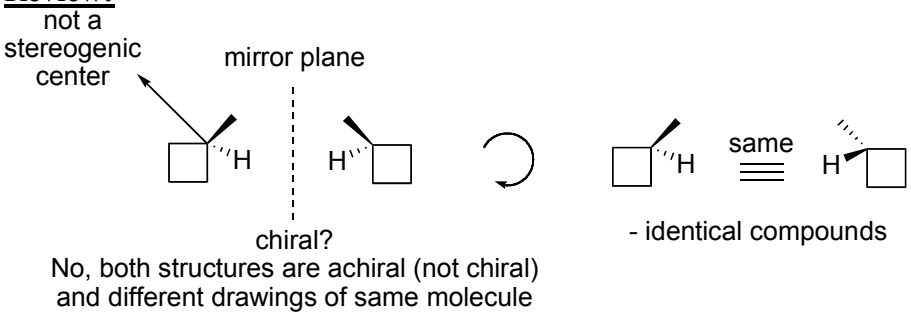
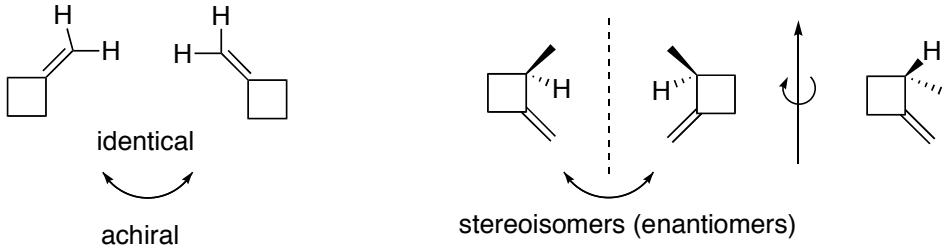
**Review:**




More examples:




If there is plane of symmetry within a molecule: then the molecule is **Achiral** (not chiral)

Stereogenic centre (chiral centers or asymmetric centers)

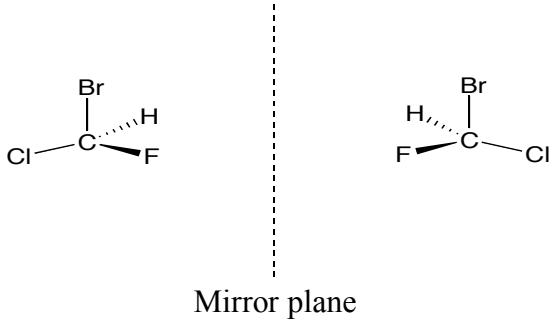
- often a tetrahedral atom (carbon) with four different groups attached.

**R/S Nomenclature :**

R and S designation of stereoisomers

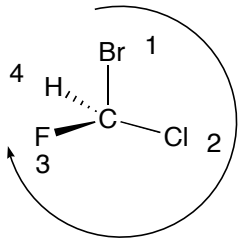
- R = Rectus
- S = Sinister

Each stereogenic center analyzed separately.
eg.



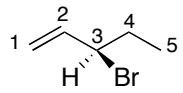
Labeling a stereogenic centre as R or S:

- identify all stereogenic centres (ie. 4 different substituents)
- assign priority based on atomic number (similar to *E* and *Z*)
- if you cannot decide, go to the next set of atoms
- with the lowest group pointing back, count 1, 2, 3:
  clockwise → R configuration, counterclockwise → S configuration



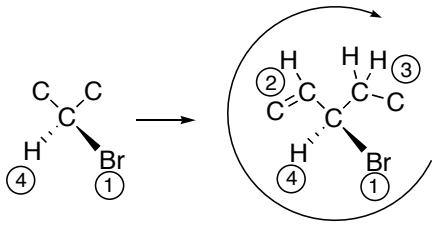

*R*-bromochlorofluoromethane

eg.




3-Bromo-1-Pentene

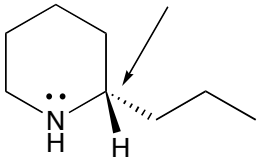
- #3 is stereogenic center



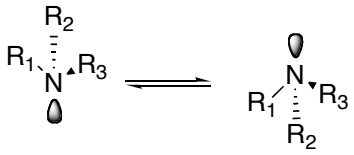
- clockwise So "R" - configuration.

eg.

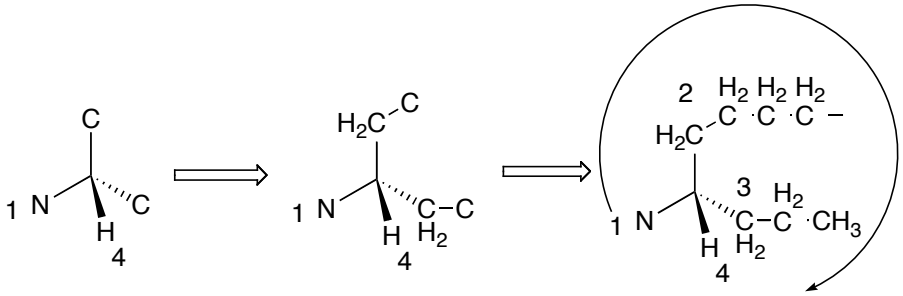
stereogenic center




coniine: poison from Hemlock

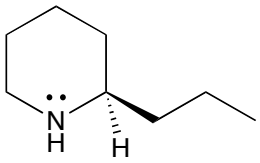



N can invert fast



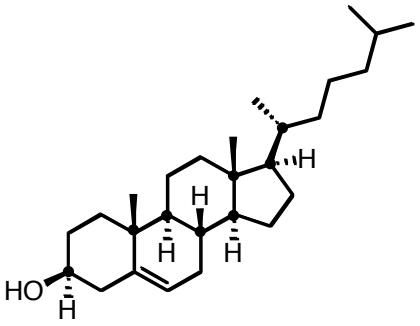
- counting 1, 2, 3 gives clockwise, BUT the smallest group is pointing forward, so the configuration is opposite of what you get if the smallest group is back
- in this case, the configuration of the stereogenic centre is **"S"**

To draw an enantiomer invert **every** stereogenic centre




Enantiomer of coniine (non toxic)

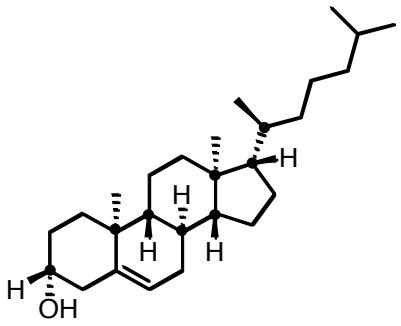
Cholesterol

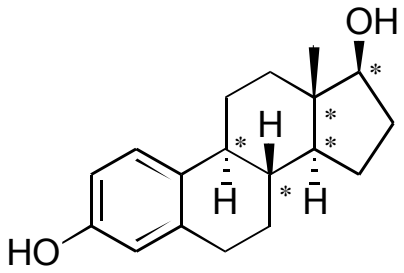



cholesterol

- stereogenic centres (8)
  - 256 stereoisomers possible or $2^8$
  - 1 isomer is cholesterol
  - 1 is enantiomer of cholesterol
  - 254 are diastereomers.

- To draw enantiomer – invert every stereogenic center:





Estradiol: Five Stereogenic Centres