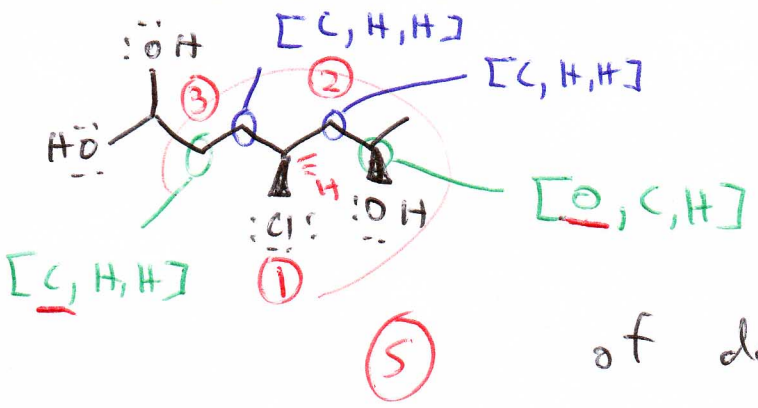
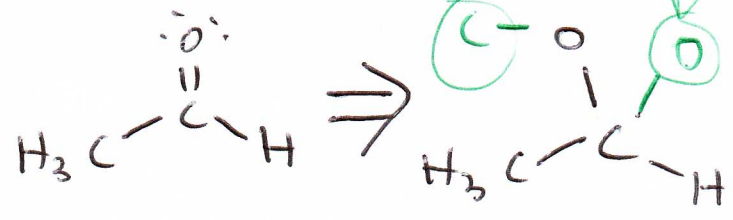


R or S ???

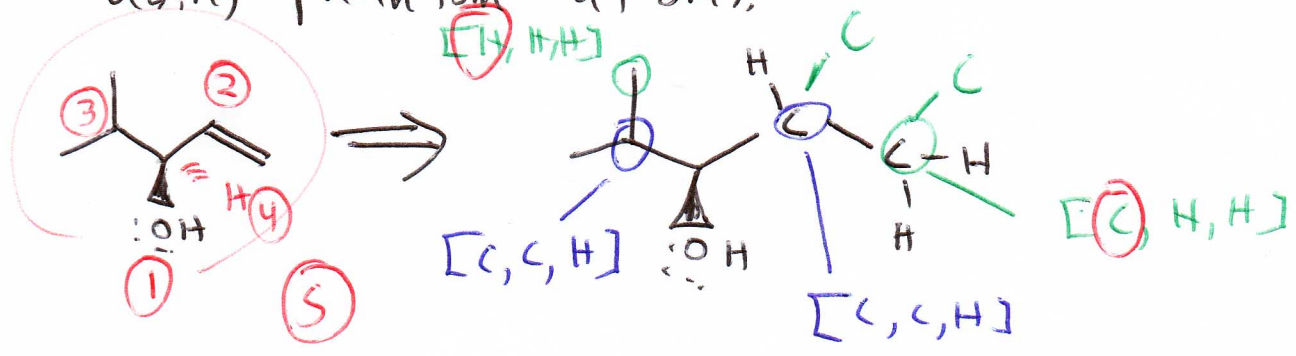


Phantom/virtual atoms



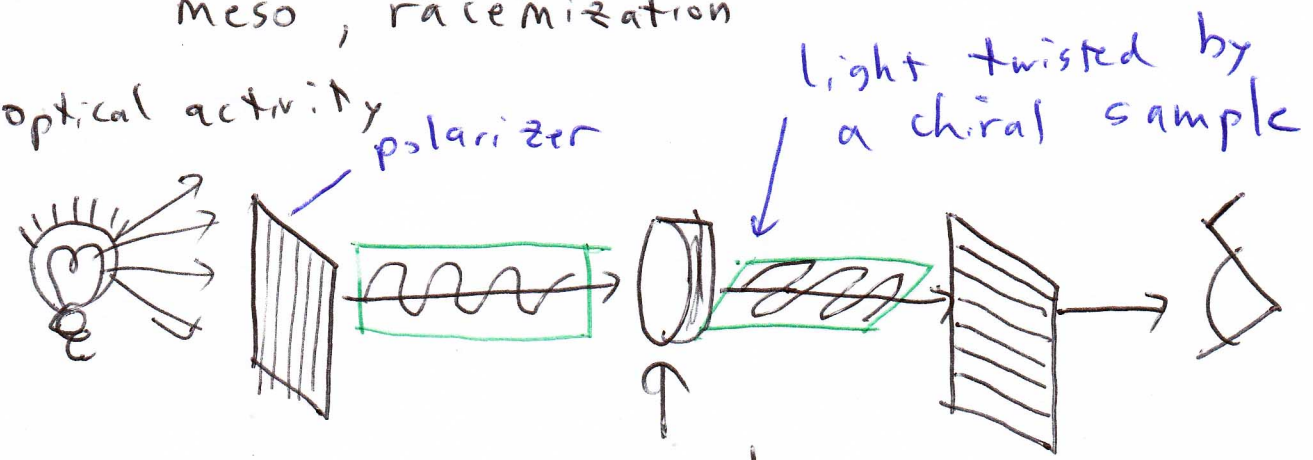
When determining priorities of double or triple bonds, the bonds are rewritten as multiple single bonds

using phantom atoms.



optical activity, enantiomers, diastereomers, meso, racemization

optical activity



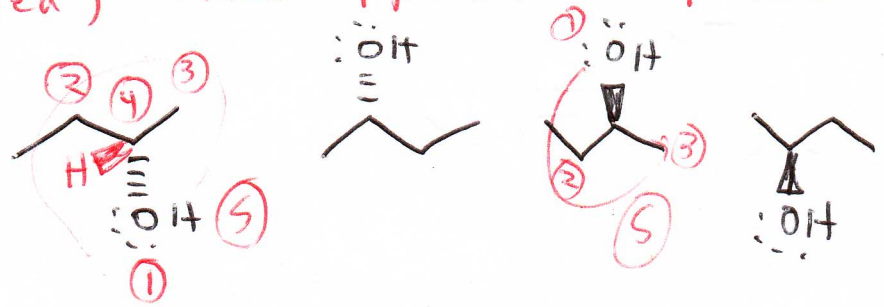
optical rotation - twisting of plane-polarized light caused by chiral materials

clockwise → + counterclockwise → -

* Molecules that are mirror images will have equal and opposite optical rotation,

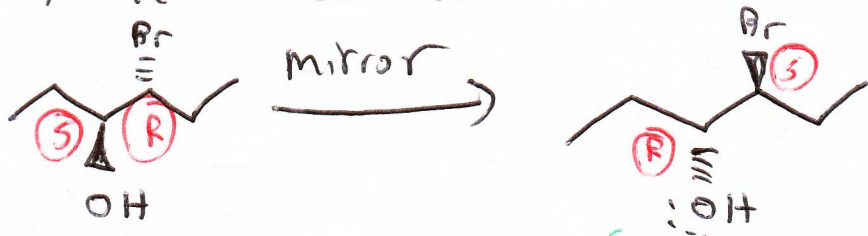
* There is no connection between R/S and +/-, except that mirror-molecules (in which R+S are reversed) have opposite optical rotation.

(S)-butan-2-ol



enantiomers - non-superimposable mirror images

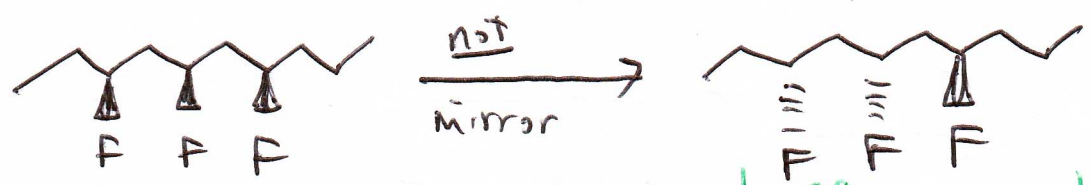
↳ All stereocenters are inverted (R ↔ S)



All physical properties of enantiomers are identical except optical rotation.

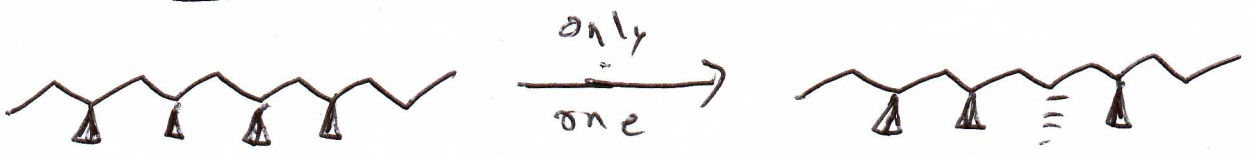
diastereomers - non-superimposable non-mirror images

↳ Some, but not all, stereocenters are inverted

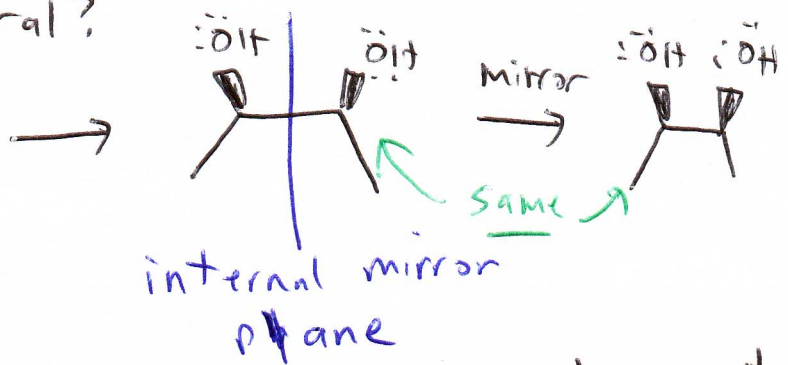
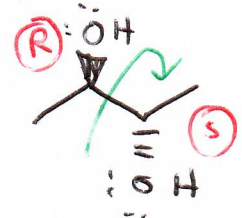


Diastereomers have different physical properties

epimer - a subset of diastereomer in which only one stereo center has changed,



Is it chiral?



internal mirror plane

meso - a molecule that has stereocenters but is achiral. This occurs when there is an internal mirror plane of symmetry. meso compounds are optically inactive since the optical rotation caused by one stereocenter is exactly balanced by the mirror stereocenter

