Ch 5

Note Title 10/3/2005

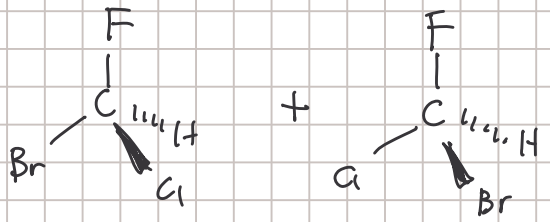
enantiomers rotate plane-polarized light by the same amount in opposite directions

enantiomers

- an (S) compound — if it rotates light in the (+) direction
- an (R) compound — then this rotates light in the (-) direction

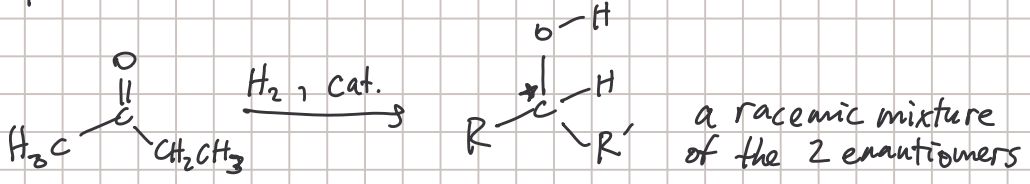
if the (S) compound rotates light in the (-) direction, the (R) cpd rotates it in the (+) direction

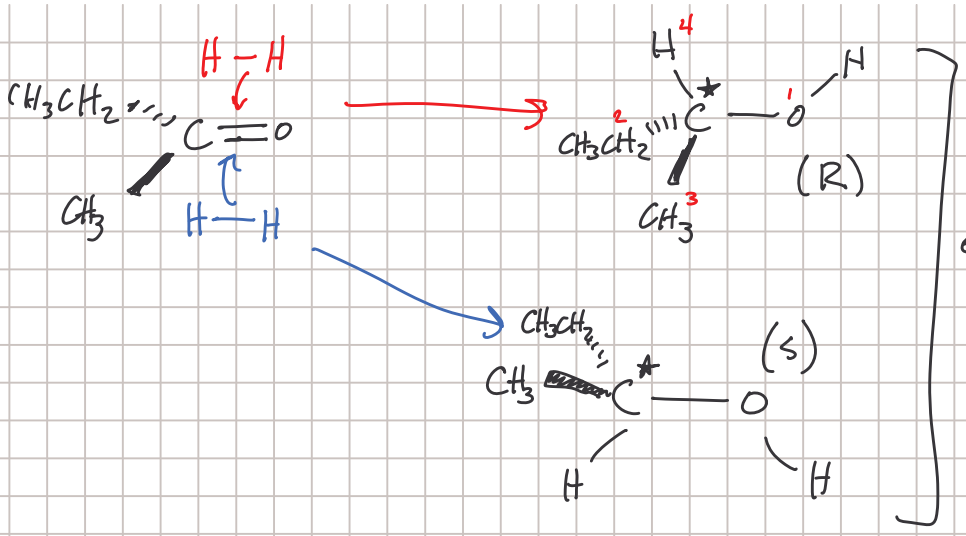
Racemic Mixture equal amounts of each enantiomer



So : So = racemic mixture

if a reaction w/ achiral reactants produces chiral product(s) the product will be a racemic mixture





enantiomers in equal amt.

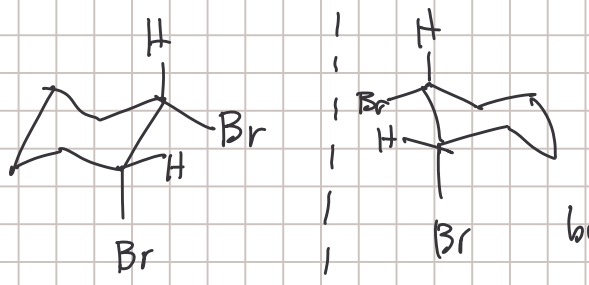
racemic mix.

(+, −)

racemic mixtures do not rotate plane-polarized light.

Conformationally-mobile systems – w/ more than 1 conformer (at room-temperature)

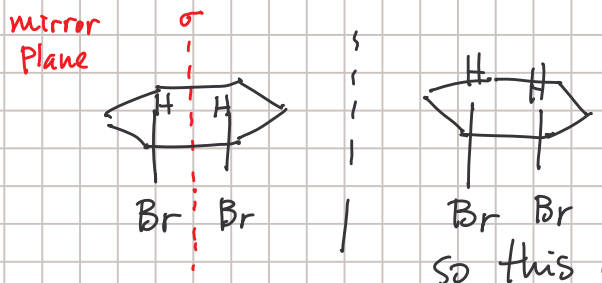
to assess chirality, use most symmetrical conformer



mirror images are non-superimposable

but this molecule is achiral

most symmetrical conformation is flat!

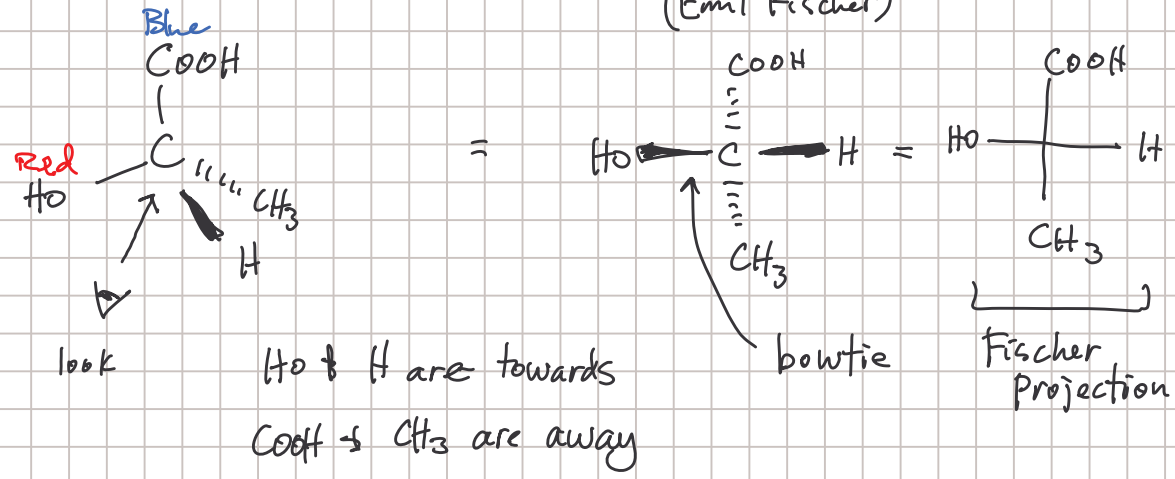


now mirror images are identical (superimposable)

so this molecule is achiral

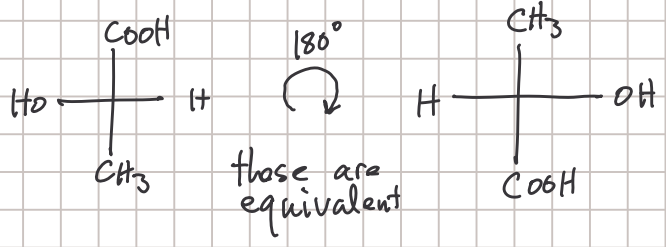
An easy way to get the most symmetrical conformation of a chain is with a Fischer projection.

(Emil Fischer)

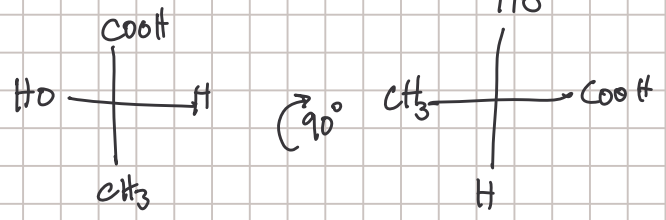


HO & H are towards
COOH & CH_3 are away

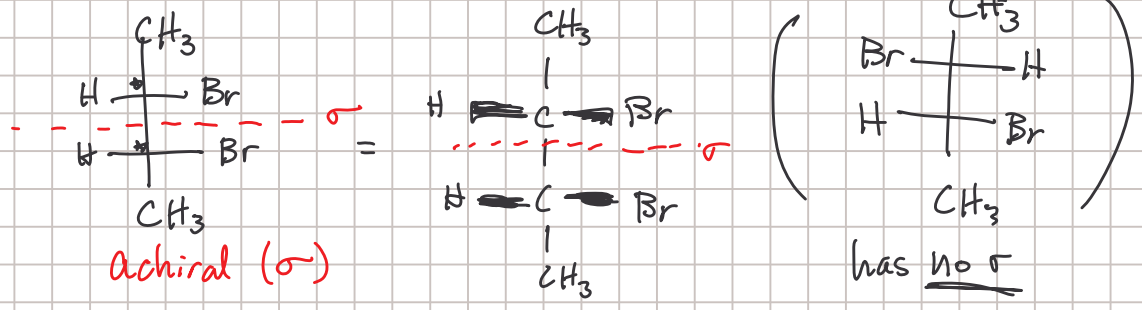
① 180° rotations are allowed!

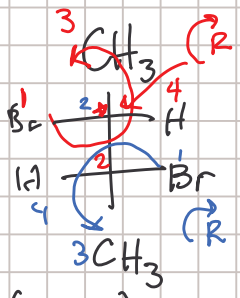


② 90° rotations are not allowed



It's very easy to find symmetry!





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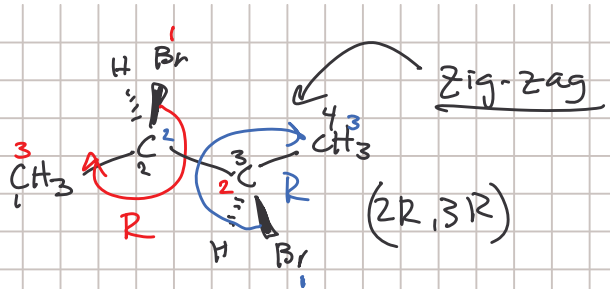
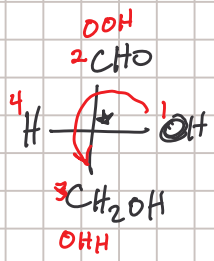


different conformations of same compound

(2R, 3R) 2,3-dibromobutane

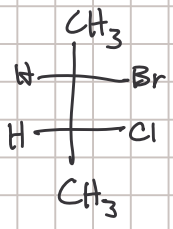
↳ numbering C's in chain (C#2 is R, C#3 is R)

Assigning (R) & (S) to Fischer projections

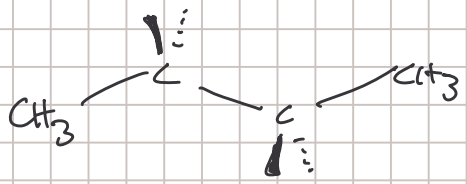


but #4 is forward! R configuration

Fischer proj. usu. have C chain vertical

draw  as a 3-d structure (zig-zag)

① assign configurations

② draw 

③ place groups so configurations match.