

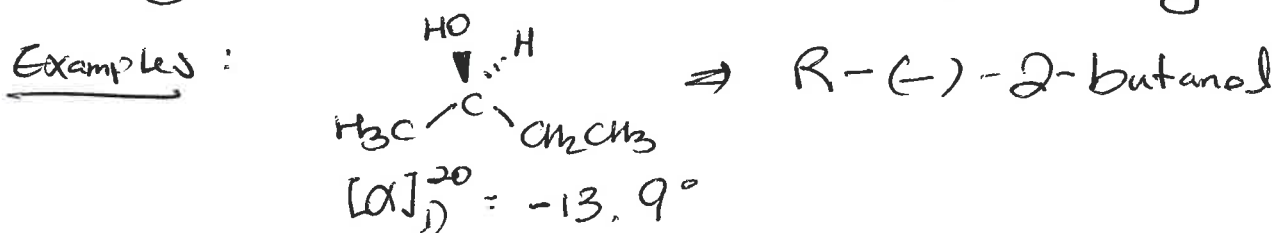
Course 343-5 Lecturer Prof. Gellman
 Day Monday! Date 10/17/2016
 Notes Taken By Sungho Total # of Pages 4

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Recall: enantiomer = mirror image (non-superimposable)

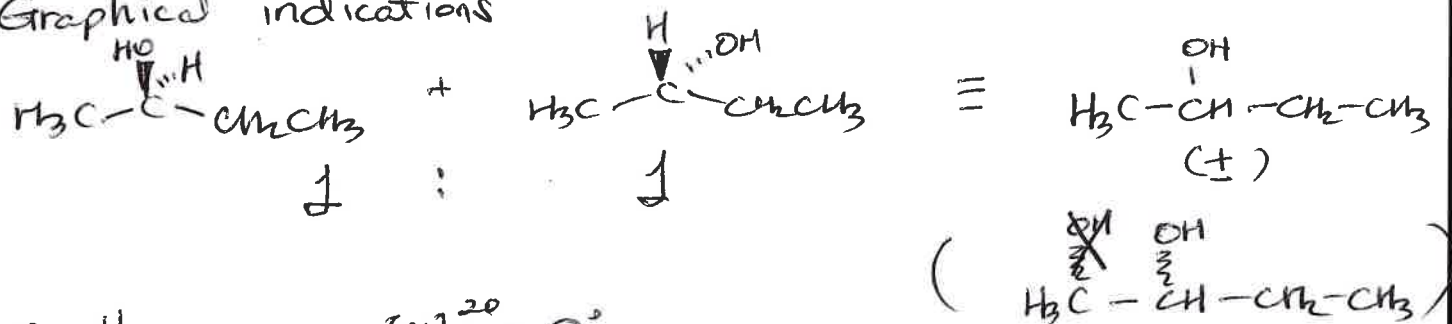
- Not every molecule has an enantiomer
- Molecules that have an enantiomer are "chiral" (others = "achiral")

Distinguish enantiomers via "optical activity"



1:1 mixture of enantiomers = "racemic mixture" (or "racemate")

Graphical indications



In these cases, $[\alpha]_D^{20} = 0^\circ$.

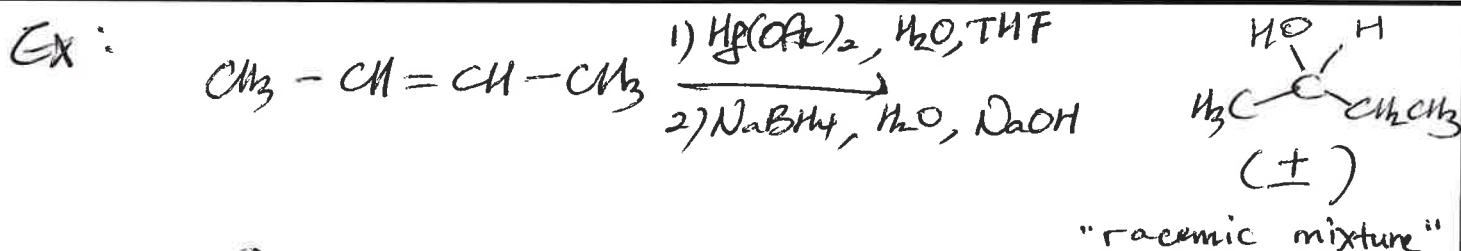
Reactions that create chiral products from achiral starting molecules necessarily generate racemic mixtures (unless reagents or environments are/is chiral)

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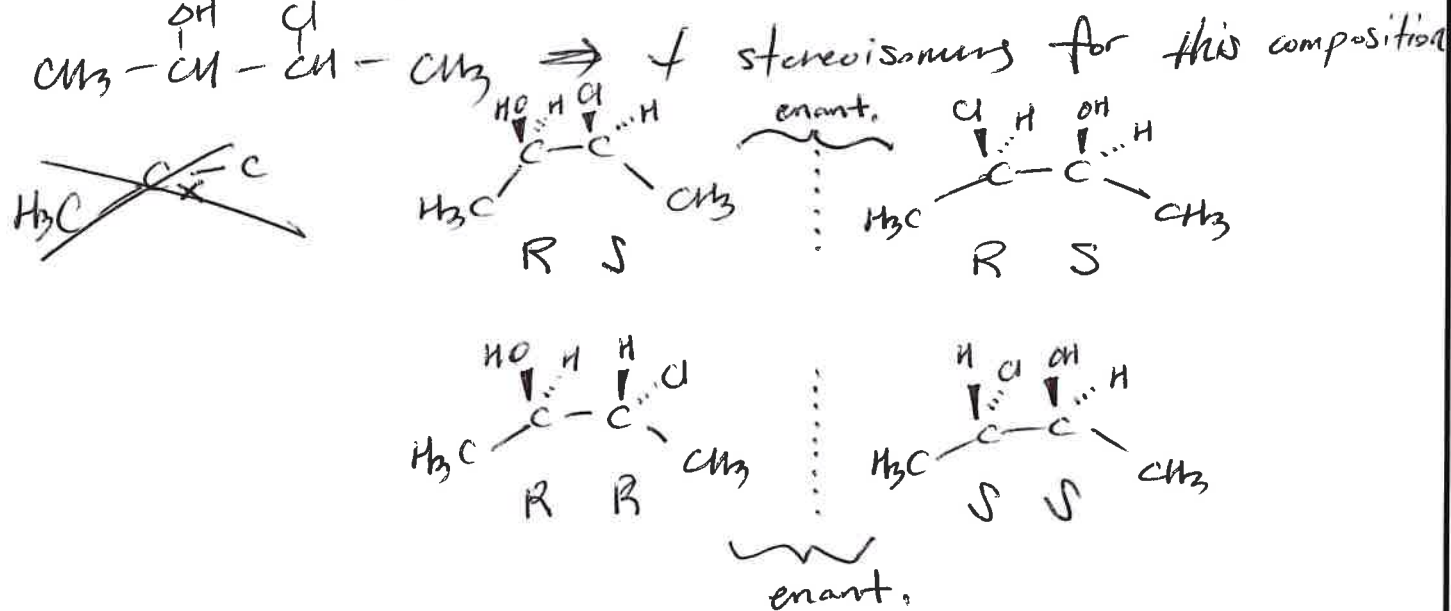
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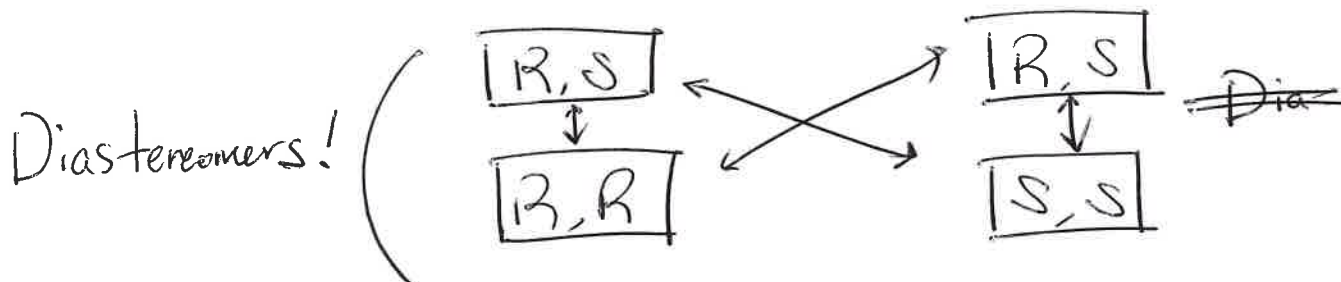
THF  achiral

Broaden consideration of "stereoisomers"

Molecules w/ 2 chiral centers...



What about the other stereoisomer relationships?



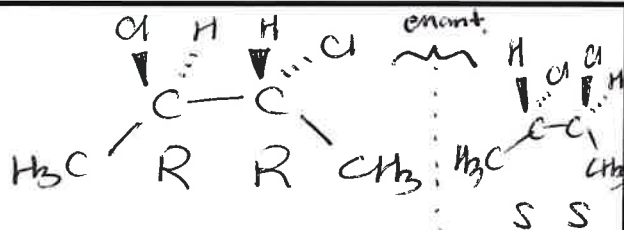
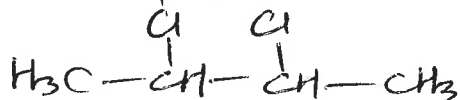
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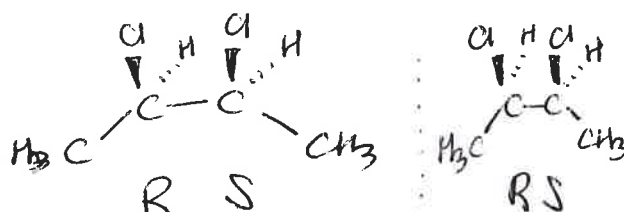
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Another example

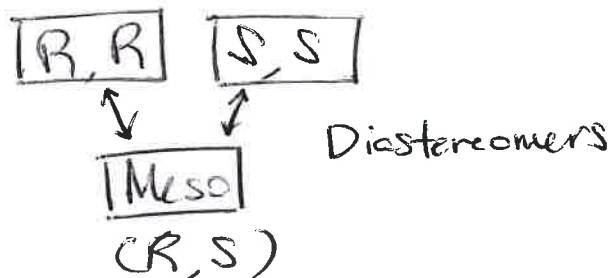
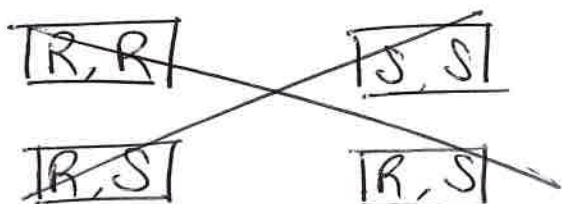


"Meso compound" \Leftarrow

Meso compounds have chiral centers but are not chiral molecules.



identical



Note: We can recognize structures as meso if we can draw a 3D form that has an internal mirror plane (or point of symmetry)



General rule: Molecule w/ n chiral centers, maximum of 2^n stereoisomers (enantiomers + diastereomers)
($< 2^n$? Then, Meso isomers exist!)

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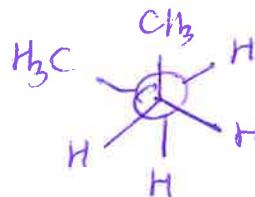
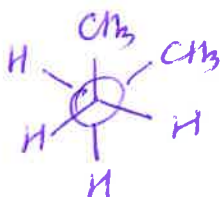
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Stereoisomer definitions should be applied to molecules,
NOT conformations!



achiral



gauche conformation

(This conformation is chiral!)

But molecule itself is achiral.