

Course Chem 343 Lecturer Collman
Day Wednesday Date 10/14/15
Notes Taken By Nolan Blythe Total # of Pages 4

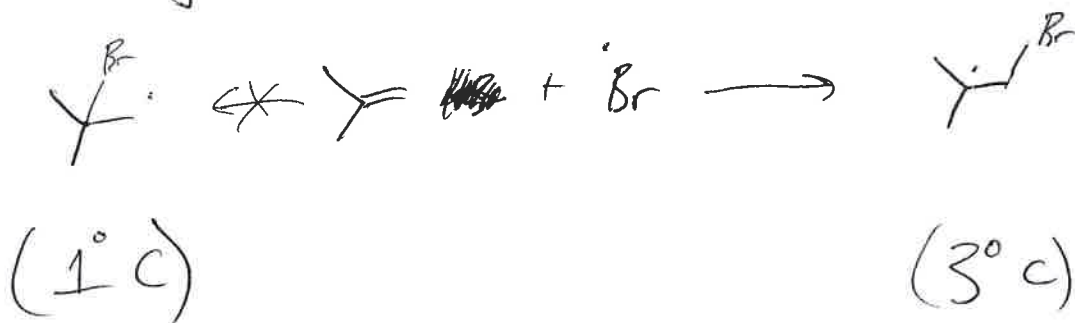
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Recall: Anti-Markovnikov HBr addition to alkenes



Mechanism involves radical intermediates (chain rxn)

Product determining step:



Rationale

- 1) 3° radical more stable than 1° radical
- 2) sterics

Chapter 6 - Stereoisomerism (Stereochemistry)

Rec. Problems - 1, 3-7, 8b, 9, 11a, 13-21, 24-40, 45-49

[Don't worry about "sawhorse"]

Enantiomer - isomer that are mirror images of one another
(non-superimposable)

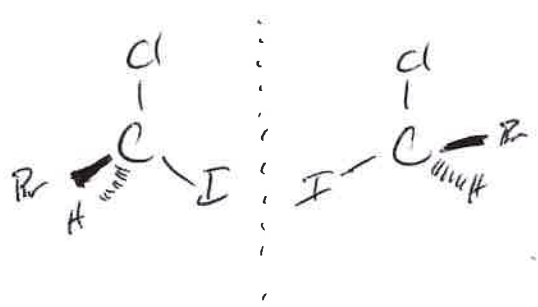
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Organic molecules are either ... → "Chiral" - mirror images are not superimposable

Common but not universal feature:

- Most chiral molecules contain at least one sp^3 carbon that has four different entities attached.

or
 "achiral" - mirror images are identical



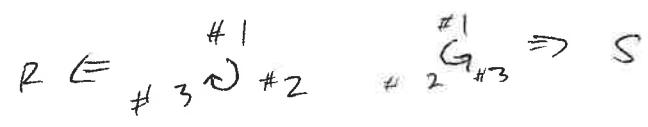
Note: An sp^3 C (or other atom) w/ 4 different entities attached is a "chiral center", "stereogenic center", "stereocenter"

R,S - Nomenclature for specifying configuration of a stereogenic center
 Use the rules for assigning priorities to substituents to deduce R or S.

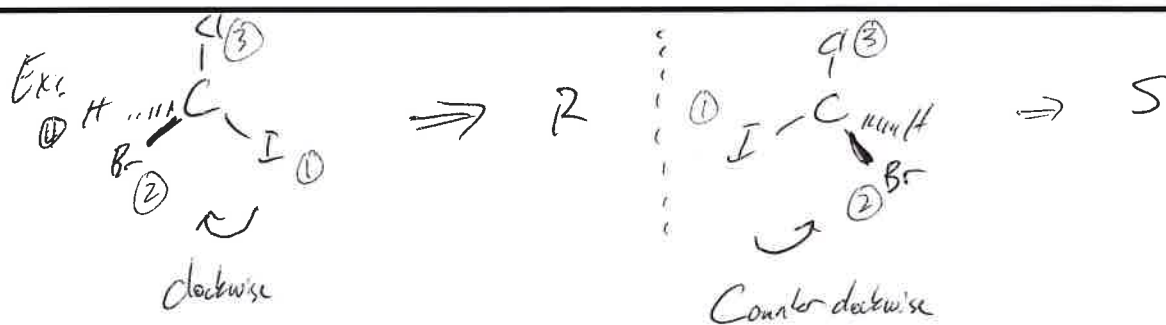
Assign R vs S

- 1) Assign priority (1-4)
- 2) Orient molecule so lowest priority points away from you

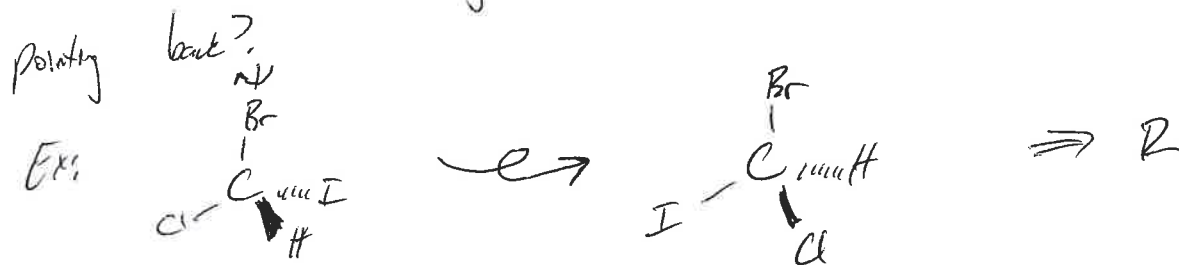
3) Then...



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What if the drawing is not "convenient" i.e. #4 is not



Experimental distinction of one enantiomer from another?

→ enantiomers are identical in many physical properties!

melting point, boiling point, solubility → same

optical activity ⇒ different

Recall: Properties of Light (pp. 237-240)



electric field oscillates \perp to propagation

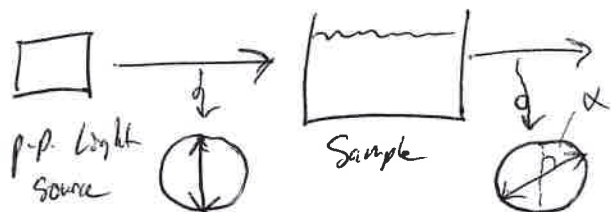
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Plane-polarized light - electric field oscillates restricted to a single plane

A solution of a single, pure enantiomer will rotate the plane of polarization. The other enantiomer causes an opposite rotation

Measurement:



α = angle of rotation of plane polarized light

Single enantiomers have a characteristic "specific rotation", one of which is the opposite of the other

Plane rotated clockwise \Rightarrow rotation > 0 Counter-clockwise \Rightarrow rotation < 0

R,S is Matter

