(24) **Today**

Sections 5.6 – 5.12
Diastereomers and Prochirality

**Next Class** (25)

Section 6.1: Kinds of Organic Reactions
Section 6.8: Describing a Reaction: Bond Dissociation Energies
Section 6.7: Describing a Reaction: Equilibria, Rates, and Energy Changes
Section 6.2: How Organic Reactions Occur: Mechanisms
Section 6.9: Describing a Reaction: Energy Diagrams and Transition States
Section 6.10: Describing a Reaction: Intermediates

(26) **Second Class from Today**

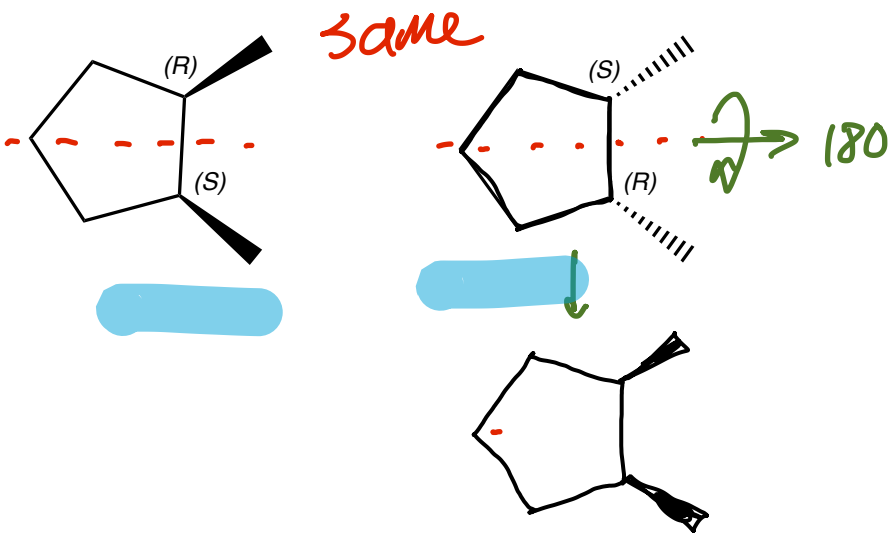
Section 6.1: Kinds of Organic Reactions
Section 6.8: Describing a Reaction: Bond Dissociation Energies
Section 6.7: Describing a Reaction: Equilibria, Rates, and Energy Changes
Section 6.2: How Organic Reactions Occur: Mechanisms
Section 6.9: Describing a Reaction: Energy Diagrams and Transition States
Section 6.10: Describing a Reaction: Intermediates

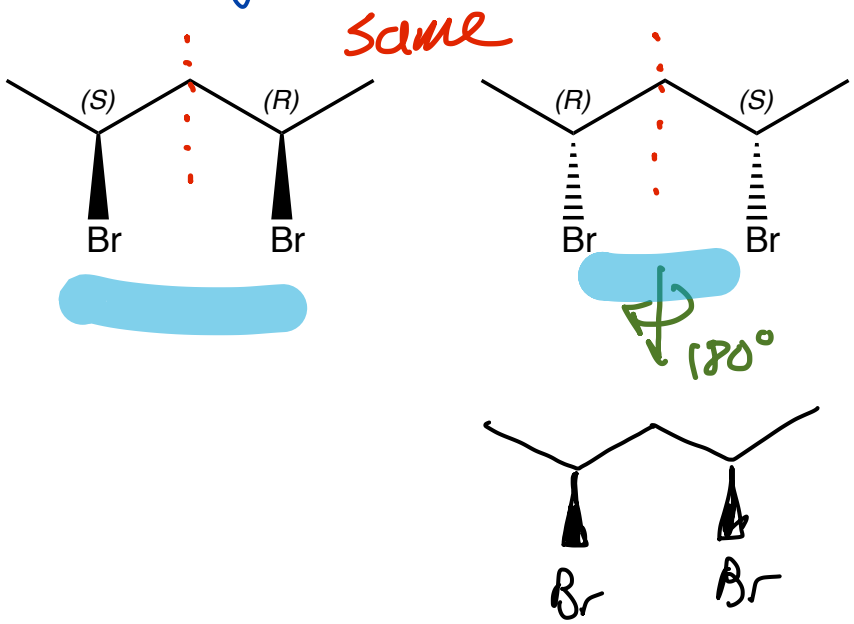
**Third Class from Today** (27)

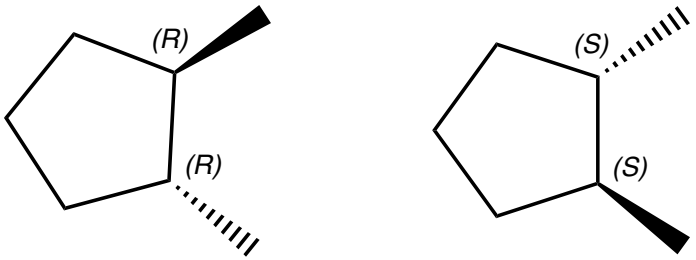
Section 6.5: Using Curved Arrows in Polar Reaction Mechanisms
Section 6.6: Radical Reactions
Section 6.3: Polar Reactions
Electron rich and electron poor
Section 6.4: An Example of a Polar Reaction: Addition of HBr to Ethylene
Arrow Pushing Practice

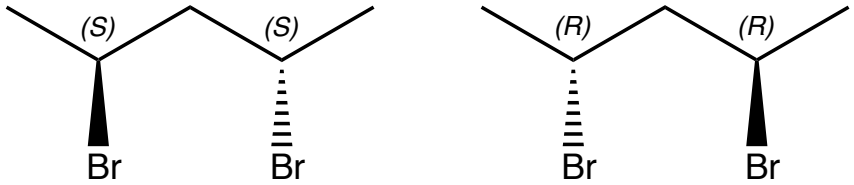
| Enantiomers | | Diastereomers |
|---|---|---|
| molecules that are<br>**nonsuperposable**<br>and<br>**mirror images**<br>of each other | ← this is the test for same vs different | molecules that have the same connectivity and are<br>→ **nonsuperposable**<br>but<br>**NOT mirror images**<br>of each other |
| The relationship can be identified using *R*,*S* system of nomenclature | | |
| If all chirality centers in a chiral molecule have opposite configurations and Z,E alkenes, if present, remain the same<br>There's a big BUT… | | In molecules with more that one chirality center at least one pair but not all pairs of chirality centers have opposite configurations. In molecules with stereogenic alkenes (*Z*/*E* configuration) the alkenes have opposite configurations |

These molecules are not chiral because they contain a mirror plane




chiral molecules

all R's → S's = mirror images

enantiomers

chiral molecules

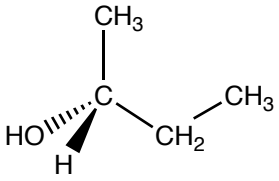
all R's → S's = mirror images

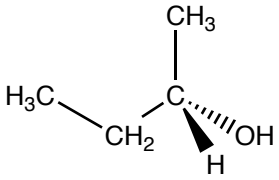
enantiomers

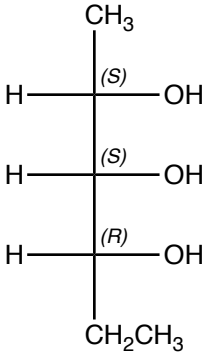
| Enantiomers | | Diastereomers |
|---|---|---|
| molecules that are<br>**nonsuperposable**<br>and<br>**mirror images**<br>of each other | | molecules that are stereoisomers<br>**nonsuperposable**<br>but<br>**NOT mirror images**<br>of each other |
| The relationship can be identified using *R*,*S* system of nomenclature | | |
| If all chirality centers in a chiral molecule have opposite configurations and Z,E alkenes, if present, remain the same<br>Unless the compound is a meso complex<br>Can occur when chirality centers have the same four different groups bonded to each chirality center | | In molecules with more that one chirality center at least one pair but not all pairs of chirality centers have opposite configurations.<br>In molecules with stereogenic alkenes (*Z*/*E* configuration) the alkenes have opposite configurations.<br>In a chiral cyclic molecules with *cis*/*trans* relationships the *cis*/*trans* relationship changes |

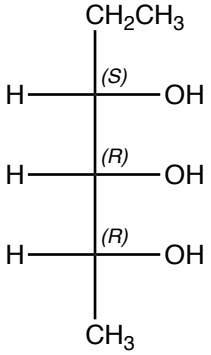
# Practice Recognizing Relationships between molecules

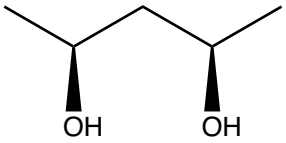
same ?  enantiomers ?  diastereomers ?

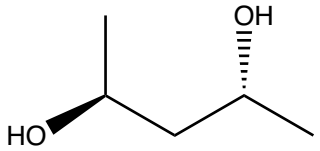


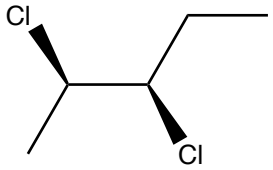



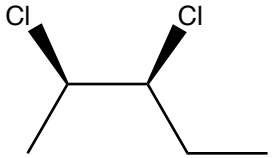



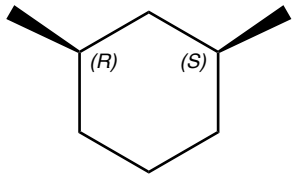



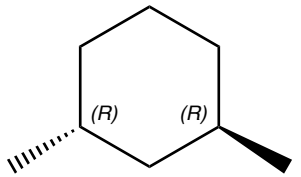



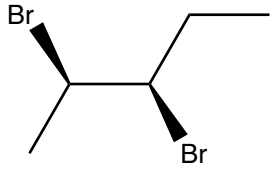



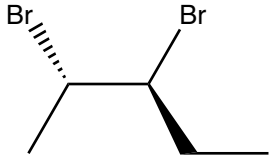



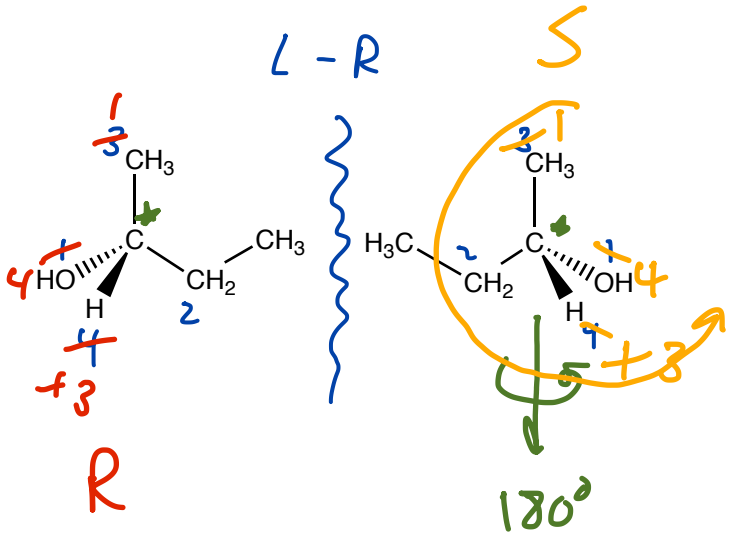



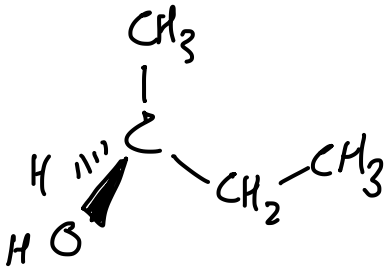



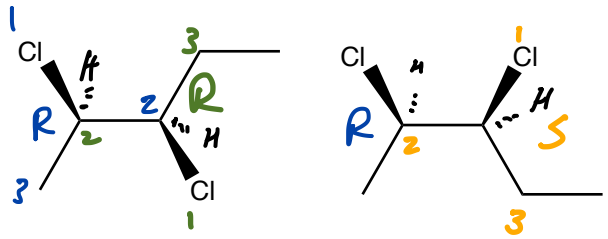
# Practice Recognizing Relationships between molecules



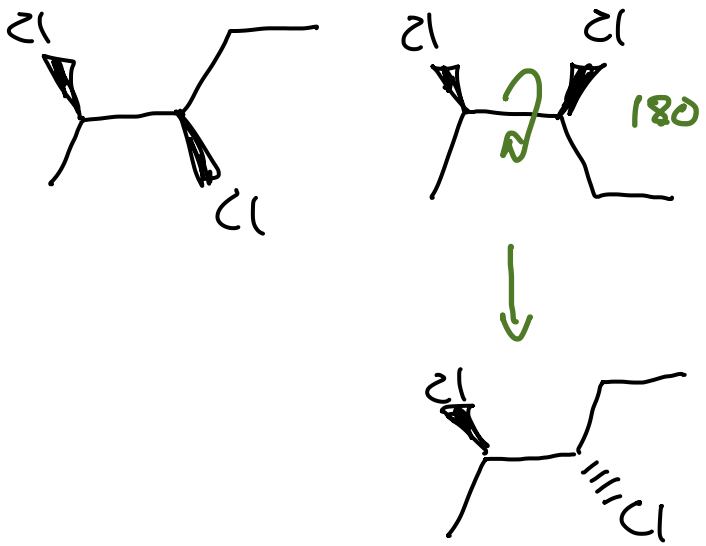



not the same

enantiomers

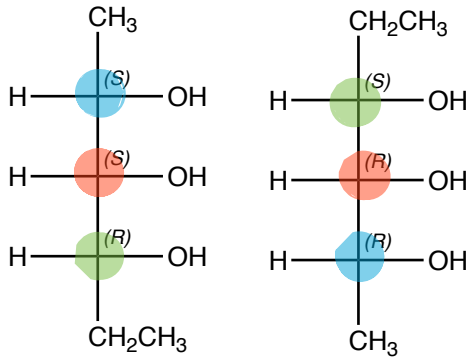


diastereomers




diastereomers

# Practice Recognizing Relationships between molecules

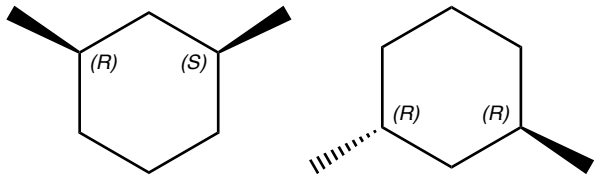



all R's → 3

all S's → R

chiral molecule

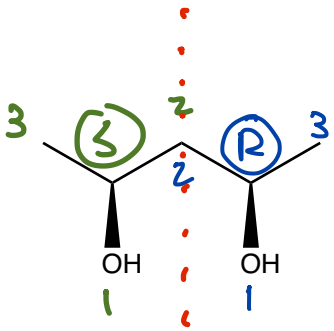
enantiomers

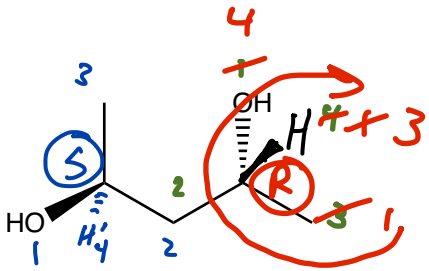



one but not both...

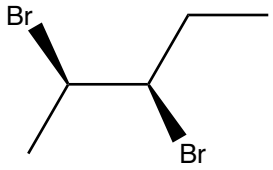
diastereomers

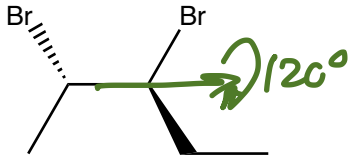
# Practice Recognizing Relationships between molecules

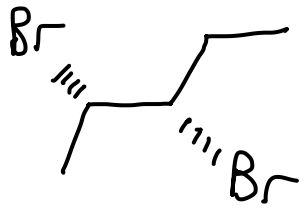



same




enantiomers