Topics
E-Z System for Naming Alkenes
Fischer Projections
Compounds with More Than One Stereocenter
Introduction to Alkyl Halides and Their Reactions
The Sn2 Reaction

E-Z System for Naming Alkenes

\[ \text{(E)} - 3\text{-chloor-4-methyl-3-heptene} \]

\[ \text{(Z)} - 3\text{-chloor-4-methyl-3-heptene} \]

Fischer Projections

\[ \text{(S)-Lactic Acid} \]
\[ [\alpha]_D +33.3^\circ \]

write on this side only - do not double side for genchem office
2-bromo-3-chlorobutane

\[
\begin{align*}
\text{CH}_3 & \quad \text{Br} \quad \text{H} \\
\text{Br} & \quad \text{H} \quad \text{Cl} \\
\text{H} & \quad \text{H} \\
\text{mirror plane} & \\
\text{enantiomers} & \\
\end{align*}
\]

Check by seeing if they superimpose—rotate in plane of paper only with Fischer projections.

What is the relationship between the two sets of enantiomers? 
Diastereomers—stereoisomers that are not enantiomers

Max # of stereoisomers possible = \(2^n\)
where \(n\) = # of stereocenters
(in case above, 3 stereocenters, \(2^3 = 8\))

Tartaric Acid:

\[
\begin{align*}
\text{enantiomers} & \\
\text{O} & \quad \text{OH} \quad \text{HO} \quad \text{C} = \text{O} \\
\text{HO} & \quad \text{H} \quad \text{H} \\
\text{HO} & \quad \text{H} \\
\text{O} & \quad \text{OH} \\
\end{align*}
\]

\(\text{O} = \text{C} - \text{OH} \quad \text{HO} = \text{H} \quad \text{HO} = \text{HO} = \text{H}\)

4 possibilities (2 pairs, but 2nd and 2 are superimposable (rotate by 180°).)
3 stereoisomers—meso form

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(R),(R) enantiomer $[\alpha]_D = +12^\circ$
(S),(S) enantiomer $[\alpha]_D = -12^\circ$

Introduction to Alkyl Halides

alkyl halide - compounds containing C-H-X (halogen) with the halogen bonded to an sp^3 carbon

chloroethane

CH_3-CH_2-Cl  - halides are more electronegative (C has partial positive charge - is more reactive)

\[ \text{Ethanol} \quad \text{Nuclophile} \quad \text{Kicks out weaker nucleophile (Cl^-)} \]

**Solutions**

CCl_4 carbon tetrachloride
CHCl_3 chloroform
CH_2Cl_2 dichloromethane
CHCl_3CHCl_2 dichloroethane

Aerosol Propellants & Refrigerants

(CFC's)

Chlorofluorocarbons (CFCs)
CF_2Cl_2 "Freon 12" - depletes ozone
CFCl_3 "Freon 11"

**Halons**

CBrF_3 Halon 1201
CBrClF_2 Halon 1211

(good in fire extinguishers)

\[ \text{DDT} \quad \text{insecticide} \]

not biodegradable

interferes with formation of egg shells - endangered many species