

Today

Review Degrees of Unsaturation Section 5.1

Sections 5.2 - 5.3, 5.5

Alkene nomenclature and structure, and how alkenes react

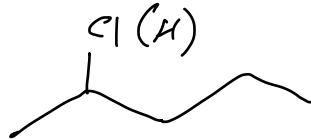
Next Class

Sections 5.5 - 5.13

How alkenes react

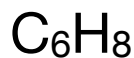
Kinetics, thermodynamics, reaction coordinate diagrams, and catalysis

Degrees of Unsaturation



Section 5.1

Determine the degrees of unsaturation in the following formulas



big H atoms
for this purpose

1. compare # of H's in molecule to number of H's in an acyclic alkane

acyclic alkane has $2n + 2$ H atoms for n C atoms

$2(6) + 2$ H atoms in acyclic alkane with 6 C atoms ... 14

2. degrees of unsaturation = $(14 - 8) / 2 = 3$ for C_6H_8

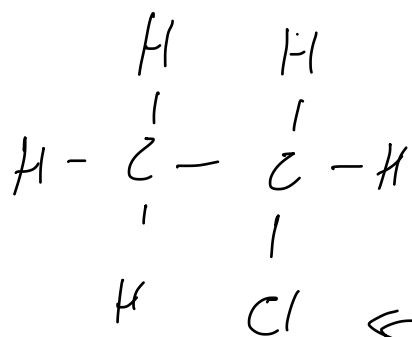
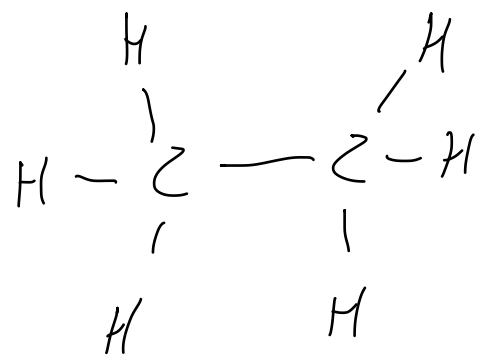
H's needed

H's present

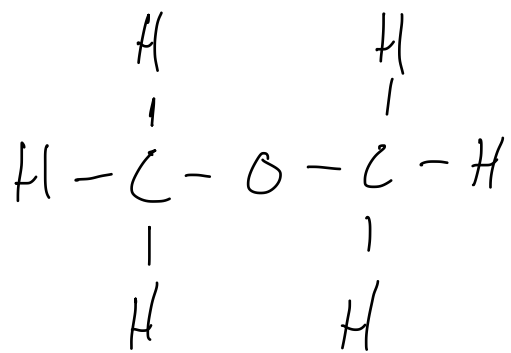
For C_6H_9Cl 1. still 6 C atoms so 14 H atoms needed

2. $(14 - (9 + 1)) / 2 = 2$

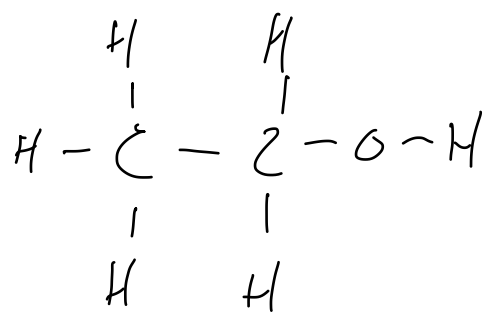
because halogens count as a big H

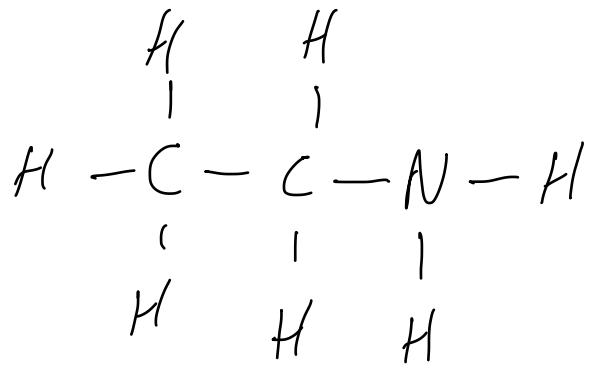
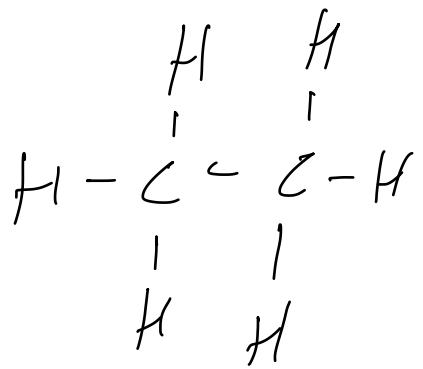


← this is taking the place of an H. The absence of the H isn't changing the degrees of unsaturation so will use the Cl as an H to make the math work.



no hydrogens were lost to get the O into the molecule





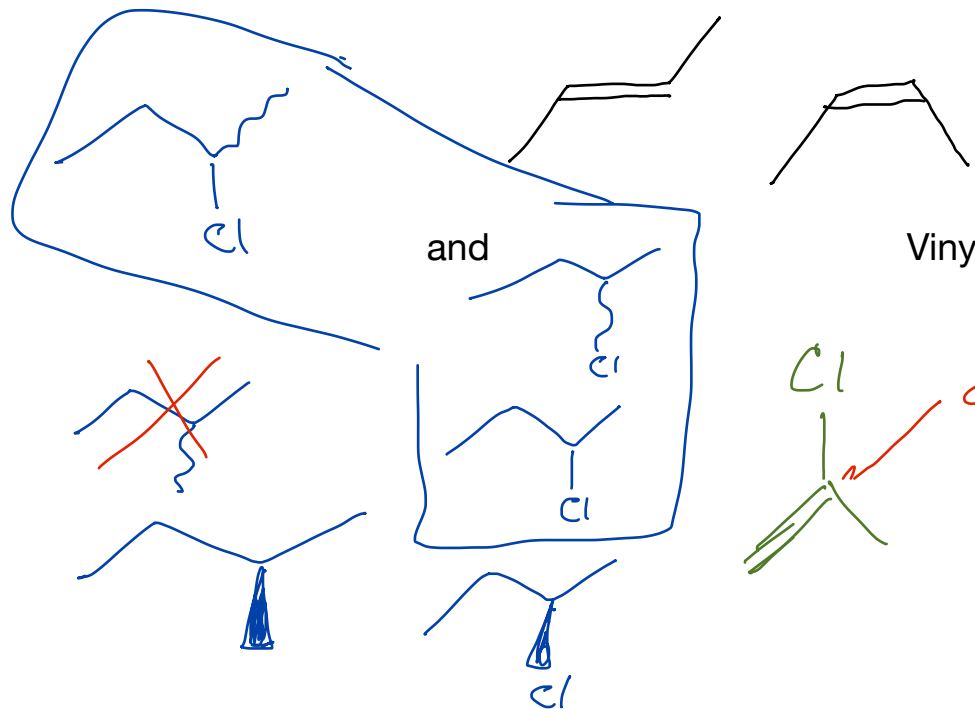
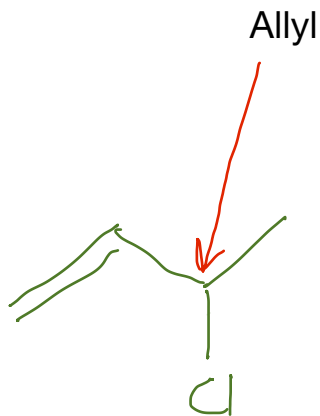
N atoms
 increase the
 # of H atoms
 that can be
 attached to an
 acyclic saturated
 molecule

$$\text{DoU} = (6 - (7 - 1)) / 2$$

take away the "extra" H atom that
 N substitution will allow for.

Alkene Nomenclature

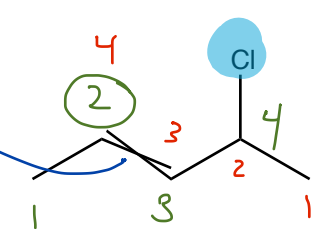
Section 5.2



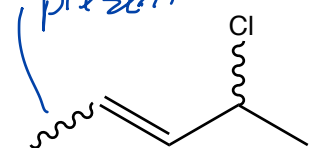
attach a thing here. This is the vinyl position

Same rules as alkanes and alcohols, except, **alkenes are a functional group**, so the position of the double bond gets the lowest number, the parent hydrocarbon must completely contain the double bond, and the "ane" ending of parent hydrocarbon is changed to "ene".

cross cross means both Z+E

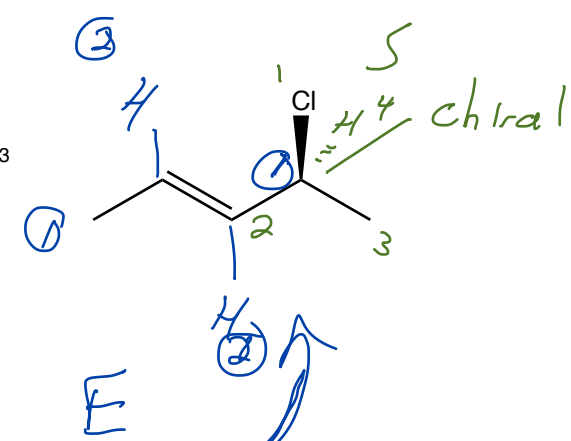


both Z+E present



no attempt to describe stereochemistry

CH3-CH=CH-CHCl-CH3



these are skeletal structures that are saying "both versions of stereogenic centers present"

(2E, 4S)-4-chloro-2-pentene

just list 1st C atom of db with lowest possible #