(32) **Today**

33 Sections 7.3 – 7.4 Nomenclature and Stereoisomers
Section 7.4 Stability of Alkenes

Section 7.5 Electrophilic Addition Reactions

Next Class (33)

Section 7.5 Electrophilic Addition Reactions 34

(34) **Second Class from Today**

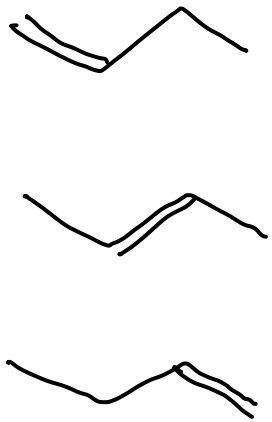
35 Chap 7

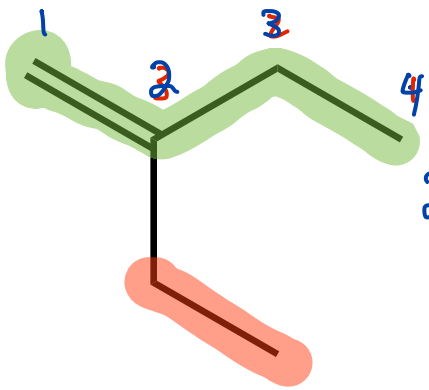
Third Class from Today (35)

Chap 7 36

Test 3 corrections due Dec 13

Same rules as alkanes except, alkenes are a functional group, so the position of the double bond gets the lowest number and "ane" ending of parent hydrocarbon is changed to "ene" and the double bond **must** be contained in the longest carbon chain.





butane

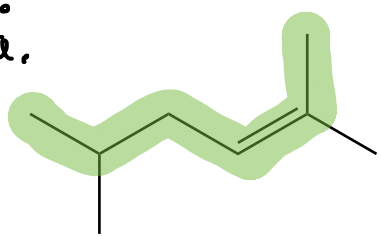
2-ethyl-1-butene

note... no 2 the assumption is the the db goes to the next higher number

Same rules as alkanes except, alkenes are a functional group, so the position of the double bond gets the lowest number and "ane" ending of parent hydrocarbon is changed to "ene" and the double bond **must** be contained in the longest carbon chain.

1.

a.

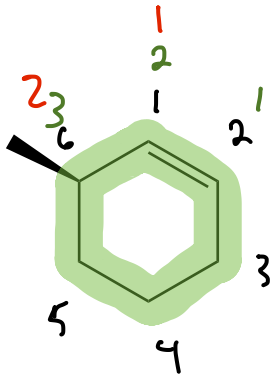


~~5-methyl-2-methylhexene~~

2,5-dimethyl-2-hexene

2,5-dimethylhex-2-ene

b.



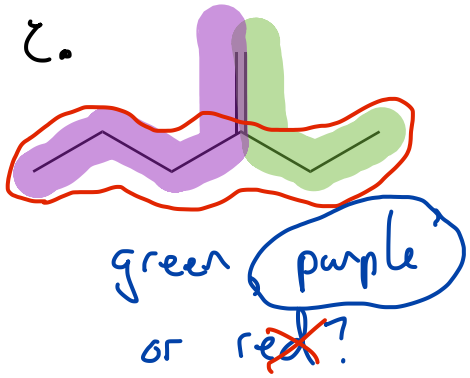
3-methylcyclohexene

technically correct

3-methyl-1-cyclohexen

just in case

c.



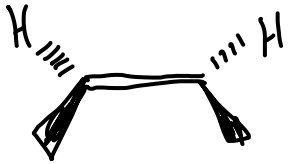
2-ethyl-1-pentene

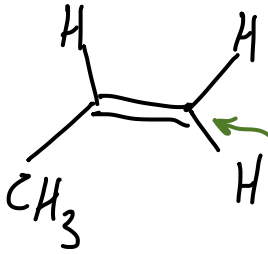
green purple

or red?

diastereomers

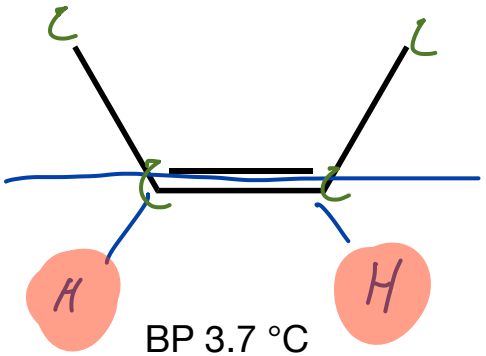
Convert $CH_3–CH=CH–CH_3$ to a skeletal structure



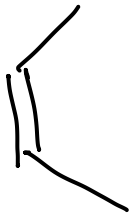


No stereoisomers for this one this end doesn't have two different groups

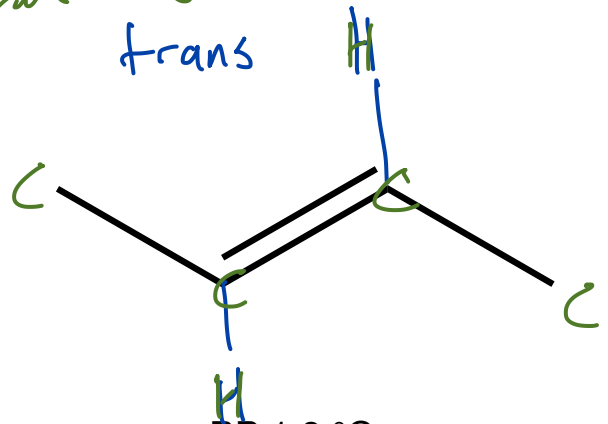
cis



BP 3.7 °C
MP -139.0 °C



trans

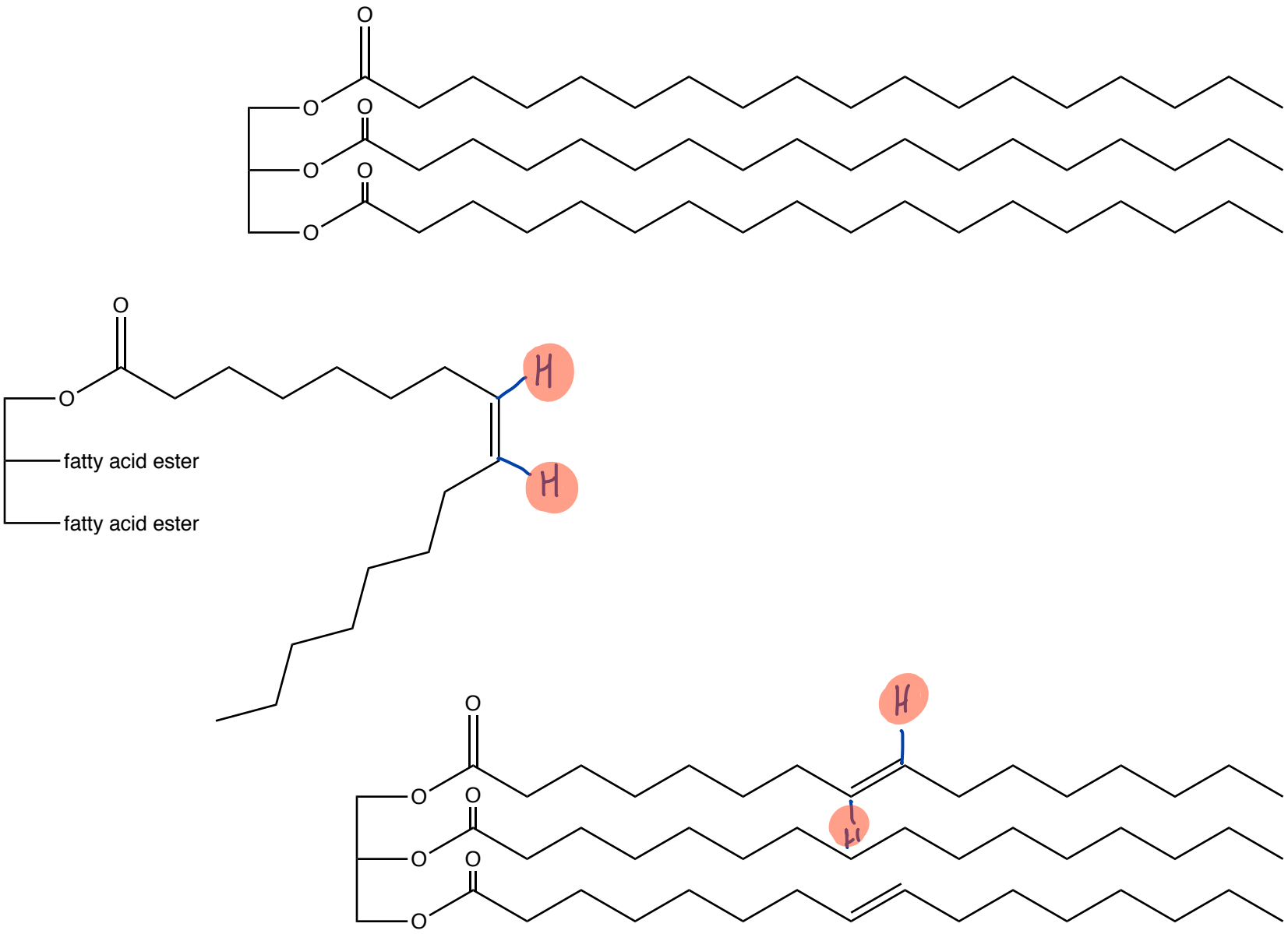


BP 1.0 °C
MP -105.0 °C

H atoms at opposite ends of the db are on the same side

H atoms at opposite ends of the db are on opposite sides

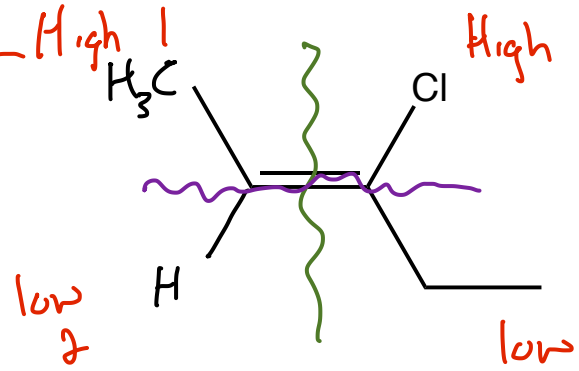
In nomenclature cis + trans when referring to the positions of the hydrogen atoms


O
O
O
O
O
O
O
O
O
fatty acid ester
fatty acid ester
H
H
H
H

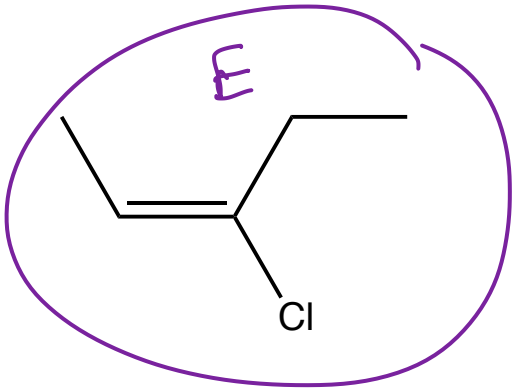
Z/E

Stereoisomers in alkenes: *cis* and *trans* nomenclature doesn't work all alkenes

Section 7.5



High 1 because Cl has an atomic # of 17



(Z)- 3-chloro-2-pentene

(E)- 3-chloro-2-pentene

BP 3.7 °C
MP -139.0 °C

BP 1.0 °C
MP -105.0 °C

We assign priorities to the groups at each end of the db

high priority groups at each end of the db are on the same side then Z (Zame Zide)

E when not Zame Zide

First: One end at a time, **assign priority** to groups at each end of double bond

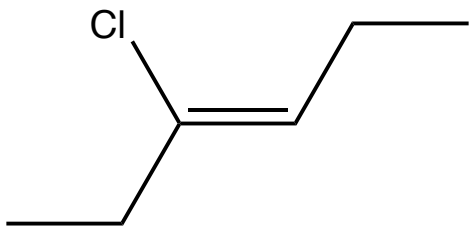
higher priority is given to the group with the higher atomic number for the atom directly bonded to the sp^2 carbon

in a tie, consider the atomic numbers of the elements attached to the element that is attached to the sp^2 carbon (move one bond further out from the sp^2 hybridized C atom)

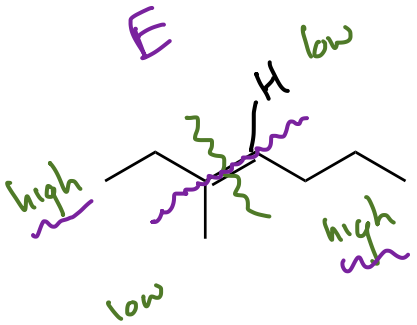
if the element that is attached to the sp^2 carbon has a doubly bonded or triply bonded atom attached to it the element is treated like there are two or three elements singly bonded to the element that is bonded to the sp^2 carbon

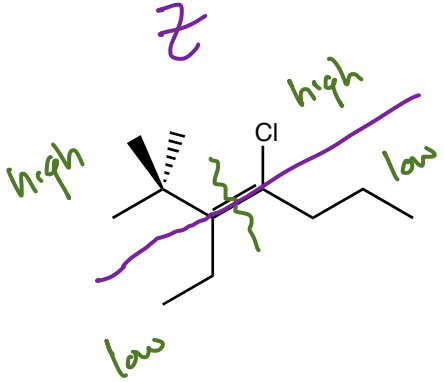
when comparing isotopes, the mass number is used (D vs H, ^{12}C vs ^{13}C)

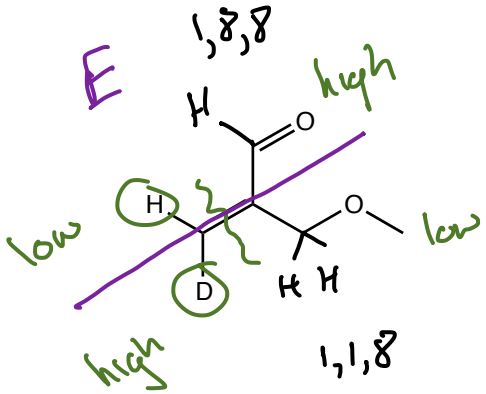
Second: If the high priority groups at each end of the double bond are on the **Zame Zide**, the proper designation is **Z**, if they are on **opposite** sides, then **E**.



https://www.westfield.ma.edu/PersonalPages/cmasi/Z,E_priority_worksheet.pdf







assign priority to the groups at each end

split the bond lengthwise and determine whether high priority groups are on the same side : Z or opposite sides E

H = ^{1}H low priority

D = ^{2}H high priority