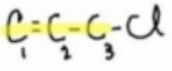
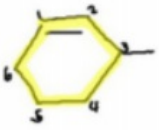
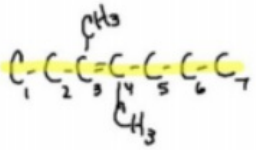
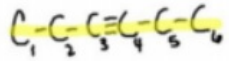
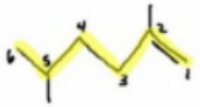
Homework:

3.16 a)  b)  c) 

d)  e)  f) 

3.18  

a) 2,5-dimethyl hexene b) 1,3-dimethyl cyclopentene

c) 2-methyl butene d) 2-propyl pentene

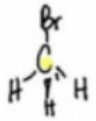
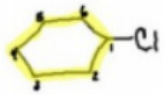
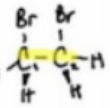
3.20 a) 2-methyl butene b) 4-isopropyl cyclohexene c) 3-methyl-2-hexene

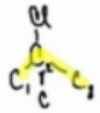
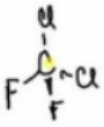
d) 2-ethyl-3-methyl pentene e) 3,3-dimethyl cyclohexene f) 3-methyl-3-heptene

2.40 a) $2\,C_6H_{14} + 19\,O_2(g) \rightarrow 12\,CO_2 + 14\,H_2O$

b) $C_6H_{12} + 9\,O_2(g) \rightarrow 6\,CO_2 + 6\,H_2O$

c) $2\,C_6H_{14} + 19\,O_2(g) \rightarrow 12\,CO_2 + 14\,H_2O$

2.42 a)  b)  c) 

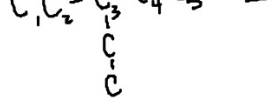
d)  e) 

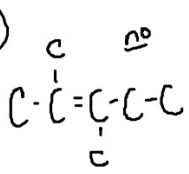
3.33 a) hydrohalogenation - none
HBr

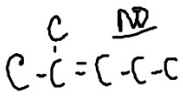
b) hydration - H_2SO_4
H_2O

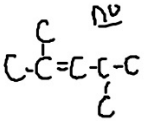
c) hydrohalogenation - none
HI

d) halogenation (alkene) - CH_2Cl_2
Br_2
(also know: halogenation (alkane) - heat or light)

c) 

d) 

e) 

f) 

10/23/18

Types of Reactions for Hydrocarbons

I. Combustion

$C_xH_y + O_2(g) \longrightarrow CO_2 + H_2O + \text{energy}$

* must be balanced

II. Halogination – substitution (catalyst: heat or light)

breaking a single bond

$C_xH_y + Cl_2(g) \xrightarrow[\text{light}]{\text{heat}} C_xH_{y-1}Cl + HCl$

$(C_xH_{y-2}Cl_2)$

Halogination – addition (catalyst: CH_2Cl_2)

breaking a double bond

$C\text{-}C{=}C\text{-}C + Br_2(g) \xrightarrow{CH_2Cl_2} C\text{-}\underset{Br}{C}\text{-}\underset{Br}{C}\text{-}C$

New Terms:

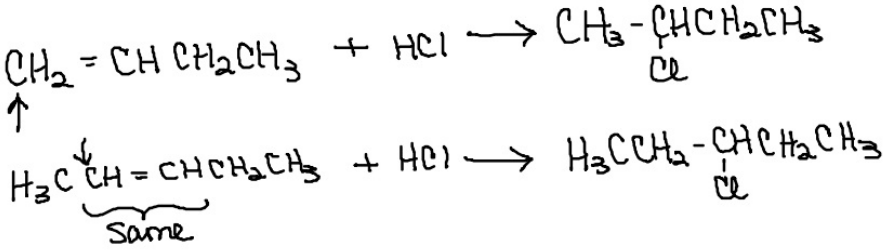
Regioselective = a reaction in which there is a preferred direction of bond formation or bond breakage.

Carbocation = when a carbon has a 1+ charge due to ~~a~~ charges during chm rxn – Very often an intermediate

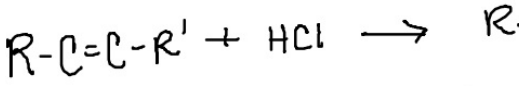
Oxonium ion = oxygen temporarily bonded to 3 other atoms, results in a positive charge

Markonikov's Rule

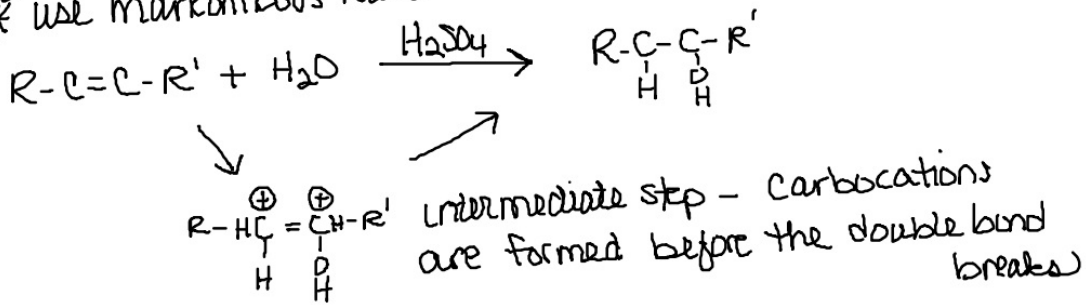
Hydrogen will bond to the carbon from the double bond that has the most hydrogen attached.
If both carbon have the same # of H, look to the next carbon.



III. Hydrohalogenation - addition
* Remember Markonikov's Rule



IV. Hydration - addition (Catalyst: H_2SO_4)
* use markonikov's Rule



V. Hydrogenation - Reduction (Catalysts: Pt, Pd, Ni 25°C 3 atm)

$$R\text{-}CH=CH\text{-}R' + H_2(g) \xrightarrow[3\,atm]{Pd\ \ 25^\circ C} R\text{-}\underset{H}{CH}\text{-}\underset{H}{CH}\text{-}R'$$

full hydrogenation - breaks all available double bonds.
partial hydrogenation - does <u>not</u> break all double bonds.

VI. Polymerization - generally formed by dehydration synthesis
the creation of long repeating units (monomers)