

Ch 10 Hydrocarbons

TODAY'S
DATE

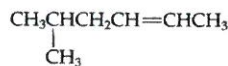
13.7

alkene

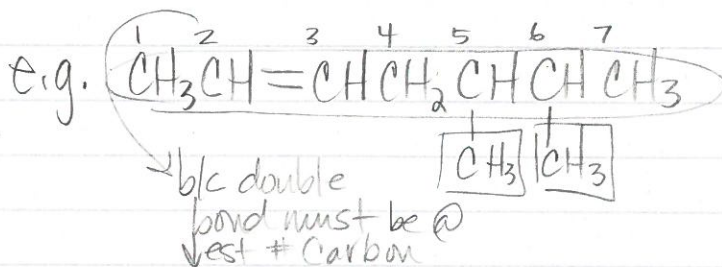
an alkene is a hydrocarbon that contains one or more carbon-carbon double bonds

rules for
naming alkenes

1. The longest chain of atoms containing the double bond is the parent compound. The name has the same stem as the alkane having the same number of carbon atoms, but ends in *-ene*. Thus the compound $\text{CH}_3\text{CH}=\text{CH}_2$ is named *propene*.
2. When it is necessary to indicate the position of the double bond, the first carbon of the two that are doubly bonded is given the lowest possible number. The compound $\text{CH}_3\text{CH}=\text{CHCH}_2\text{CH}_3$, for example, has the double bond between the second and third carbon atoms. Its name is 2-pentene.
3. Substituent groups are named as with alkanes. Their position is indicated by a number. Thus,



is 5-methyl-2-hexene. Note that the numbering of the parent chain is always done in such a way as to give the double bond the lowest number, even if that requires a substituent to have a higher number. The double bond has priority in numbering.



5,6-dimethyl-2-heptene

↑ 2-7 C chain ↑ a double bond
location of double bond

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physical
properties of
alkenes

- similar to alkanes

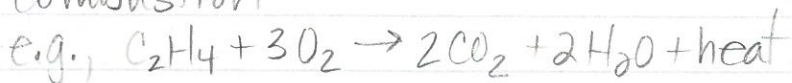
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chem properties
of alkenes

important rxns:

1) combustion

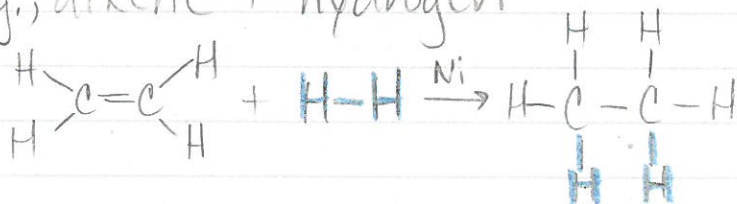
① combustion? →



② addition? →

2) addition rxn → a substituent
join to hydrocarbon molecules
at pts of unsaturated - double
or triple bonds③ ^ahydrogenation? →

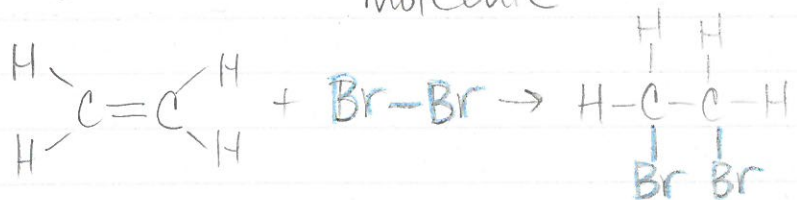
e.g., alkene + hydrogen



hydrogenation → a rxn where
H₂ reacts w/ a carbon-carbon
double or triple bond to
add H atoms to C atoms

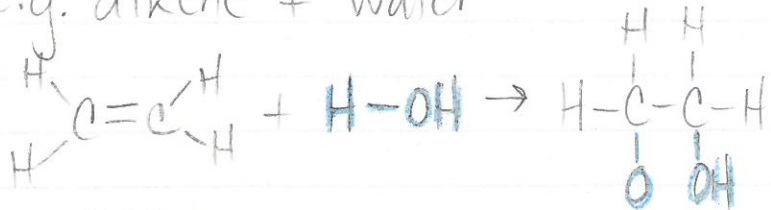
② w/ halogen? →

e.g. alkenes + halogen molecule



③ hydration? →

e.g. alkene + water

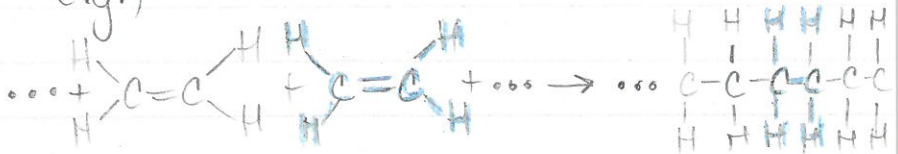


hydration → the addition of H_2O to a substance

③ ^{addition} polymerization? →

3) addition polymerization → is where monomers add to one another to produce a polymeric product that contains all the atoms of the starting monomers

e.g.)



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alkyne

a alkyne is a hydrocarbon whose molecules contain one or more carbon-carbon triple bonds

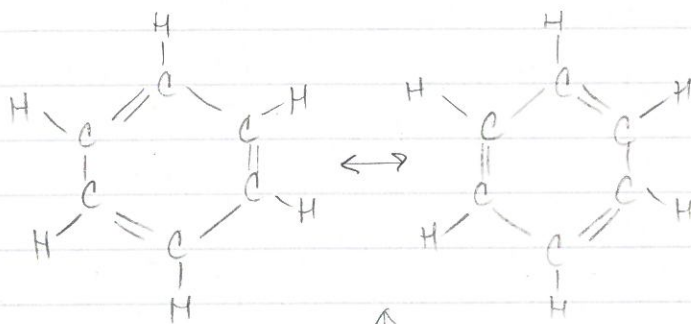
e.g., acetylene (common name) or ethyne (systematic name)



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benzene

- has the formula C_6H_6
- is unreactive + behaves more like an alkane



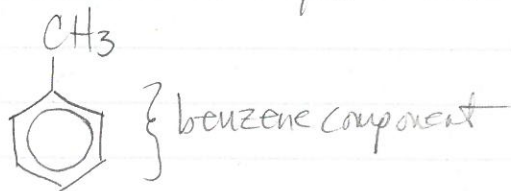
- it exhibits resonance which is a term used to describe a situation in which 2 or more plausible Lewis structures can be written (note: any molecule that exhibits resonance has one real structure)

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aromatic hydrocarbons

an aromatic hydrocarbon is a hydrocarbon w/ a benzene-like structure

e.g. toluene or methylbenzene



aliphatic compounds

an aliphatic compound is an open-chain compound or ring compound that has no aromatic groups