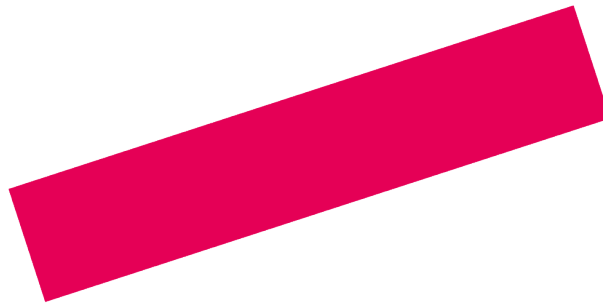


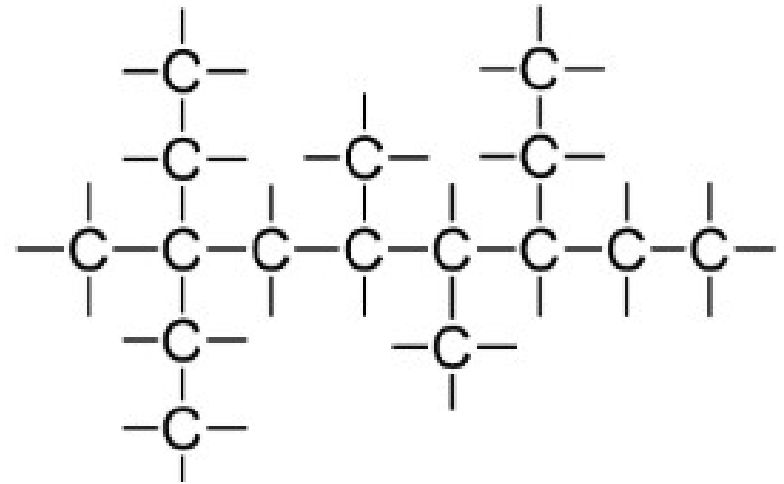
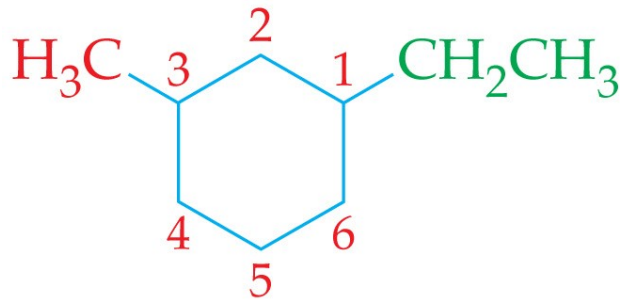
Academie toegepaste biowetenschappen en chemie

Chemie Course 3

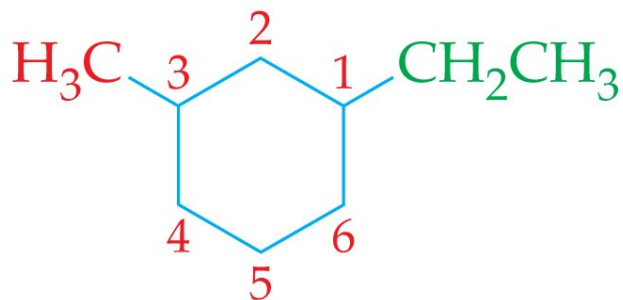


Week 6: H13

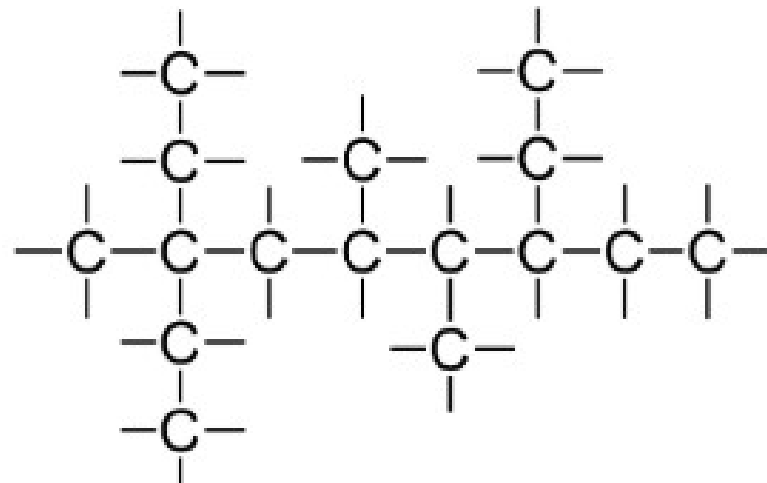
Eerst even oefenen



Eerst even oefenen



1-ethyl-3-methylcyclohexaan



3,7-diethyl-3,5,6-trimethylnonaan

Hoofdstuk 13; alkenen, alkynen en aromatische stoffen

Vandaag

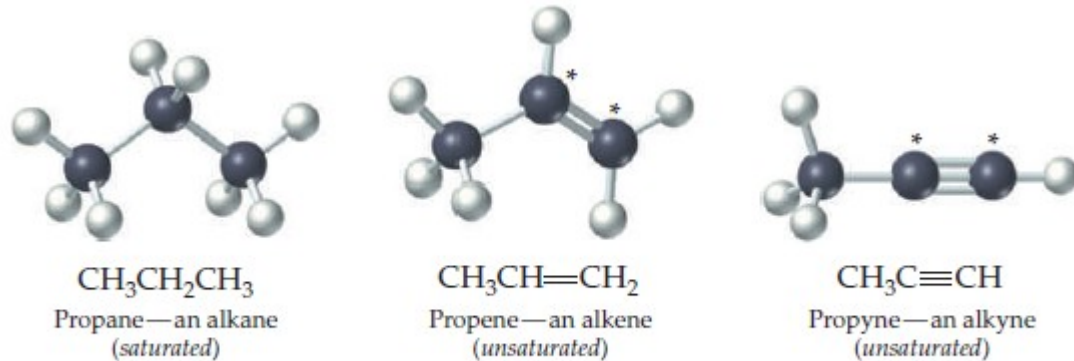
- Alkenen en alkynen benoemen

13.1 alkenen en alkynen

Wat betekent het als een organisch molecuul onverzadigd is?

13.1 alkenen en alkynen

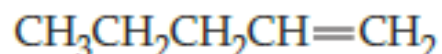
- Verzadigd vs. Onverzadigd
- Alkaan, alkeen, alkyn



Unsaturated carbons are marked with an *

13.2 Benoemen van alkenen en alkynen

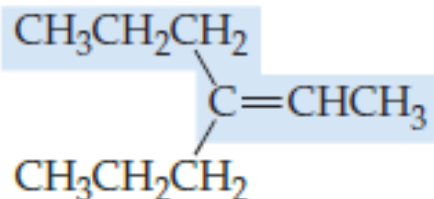
STEP 1: Name the parent compound. Find the longest chain containing the double or triple bond, and name the parent compound by adding the suffix *-ene* or *-yne* to the name for the main chain. If there is more than one double or triple bond, the number of multiple bonds is indicated using a numerical prefix (*diene* = two double bonds, *triene* = three double bonds, and so forth).



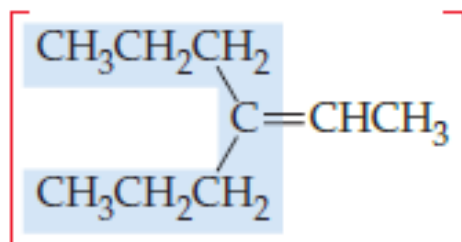
Name as a *pentene*—a 5-carbon chain containing a double bond.



Name as a *hexyne*—a 6-carbon chain containing a triple bond.



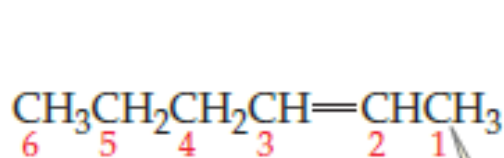
Name as a *hexene*—a 6-carbon chain containing a double bond ...



... *not* as a *heptene*, because the double bond must be included in the longest chain.

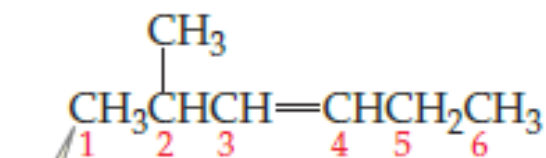
13.2 Benoemen van alkenen en alkynen

STEP 2: Number the carbon atoms in the main chain so that those with multiple bonds have the lowest index numbers possible. Thus, begin numbering at the end nearer the multiple bond (Examples 1 and 3). If the multiple bond is an equal distance from both ends, begin numbering at the end nearer the first branch point (Example 2).



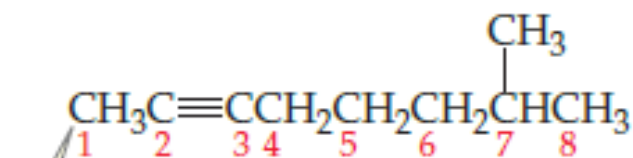
Begin at this end because it's nearer the double bond.

Example 1



Begin at this end because it's nearer the first branch point.

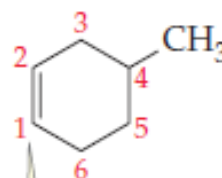
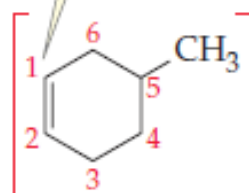
Example 2



Begin at this end because it's nearer the triple bond.

Example 3

Do not begin here.



Name as a cyclohexene.

Begin here so that the substituent has the lowest number.

Nu

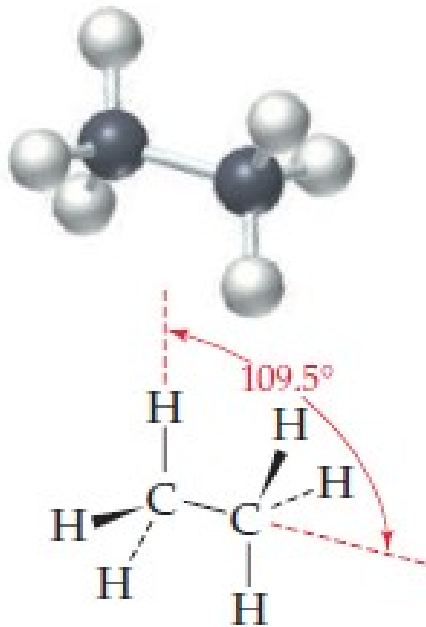
Aan de slag
t/m 13.3

13.3 De structuur van alkenen: Cis-Trans isomeren

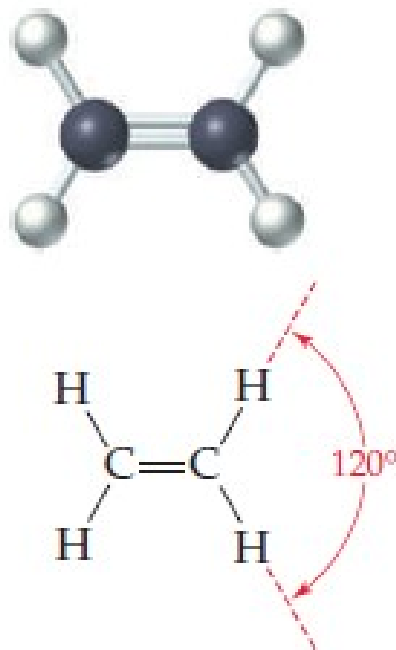
Wat zijn isomeren?

Wat zijn cis-transisomeren?

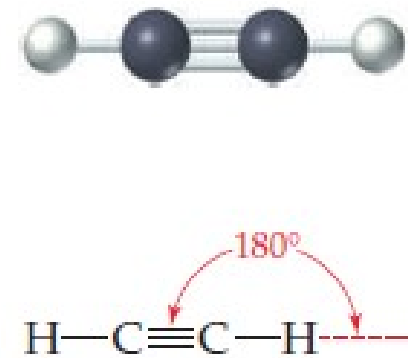
13.3 De structuur van alkenen: Cis-Trans isomeren



Ethane—a tetrahedral molecule with bond angles of 109.5°



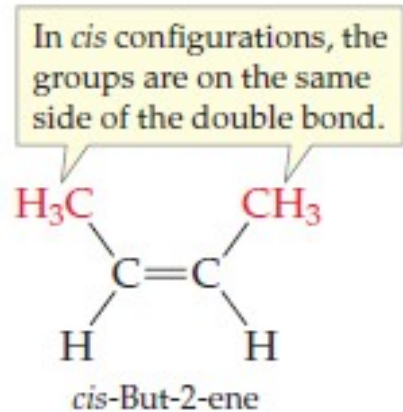
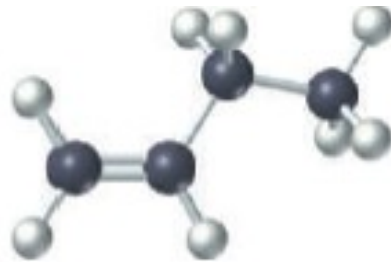
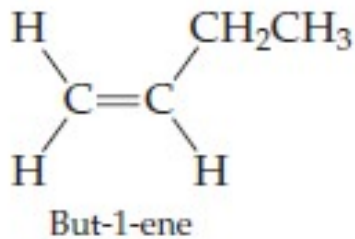
Ethene—a flat molecule with bond angles of 120°



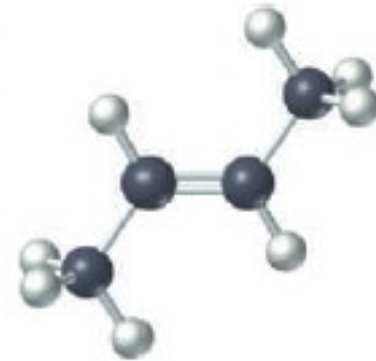
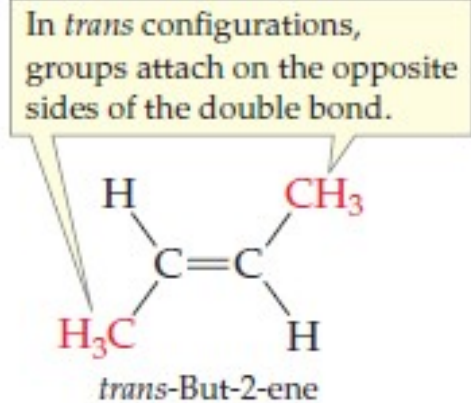
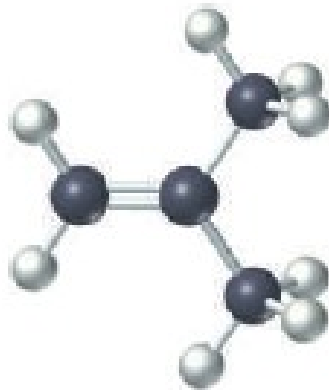
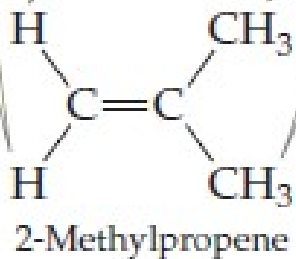
Ethyne—a linear molecule with bond angles of 180°

13.3 De structuur van alkenen: Cis-Trans isomeren

De verschillende isomeren van C_4H_8



When the groups are the same on both sides, no *cis* or *trans* isomers are possible.



Nu

Aan de slag
t/m 13.6

13.4 Eigenschappen van alkenen en alkynen

Vergelijkbaar met alkanen:

- nonpolair
- ontvlambaar
- dubbele/drievoudige bindingen maken de moleculen reactiever dan alkanen.
- Cis-transisomerie

13.5 Types of Organic Reactions

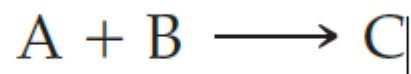
4 typen organische reacties

- Addities (additions)
- Eliminaties (eliminations)
- Substituties (substitutions)
- Herschikkingen (rearrangements)

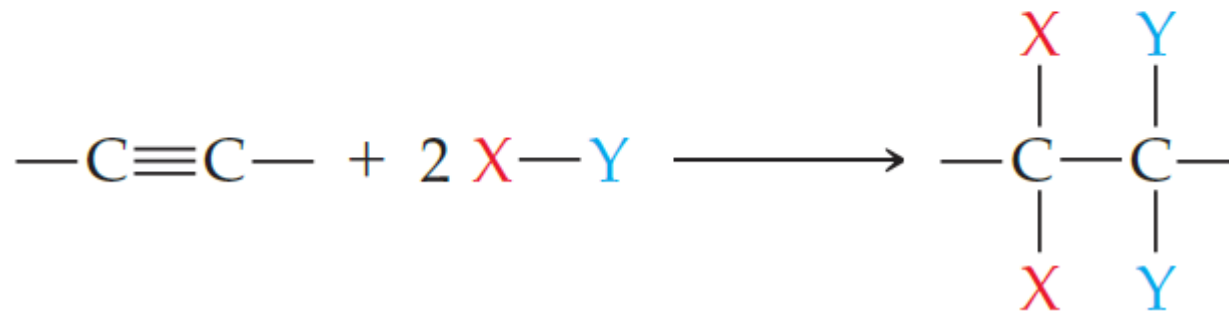
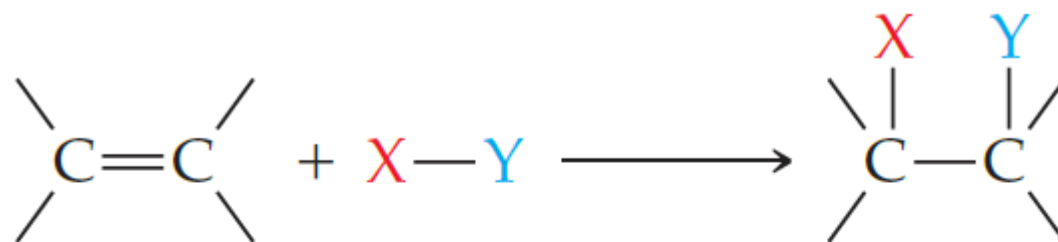
13.5 Types of Organic Reactions

Additions

These two reactants
add together ...

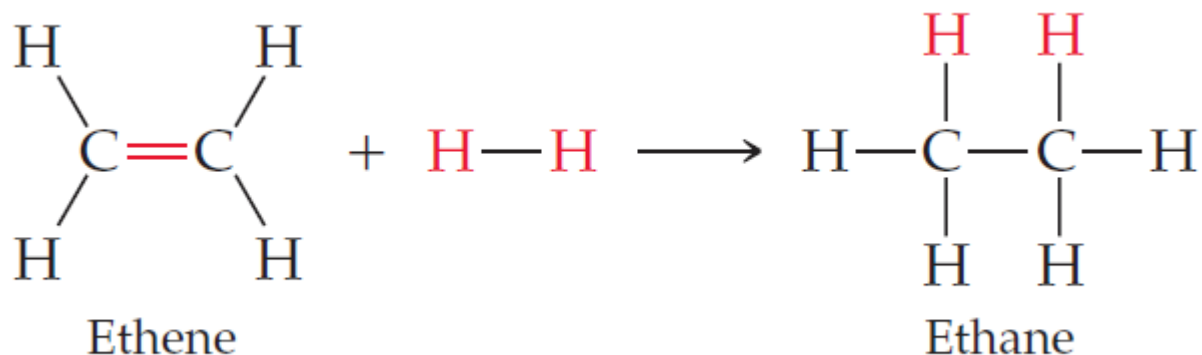


... to give this
single product.



13.5 Types of Organic Reactions

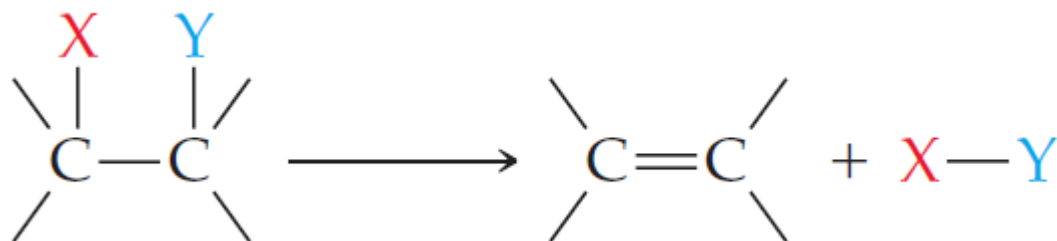
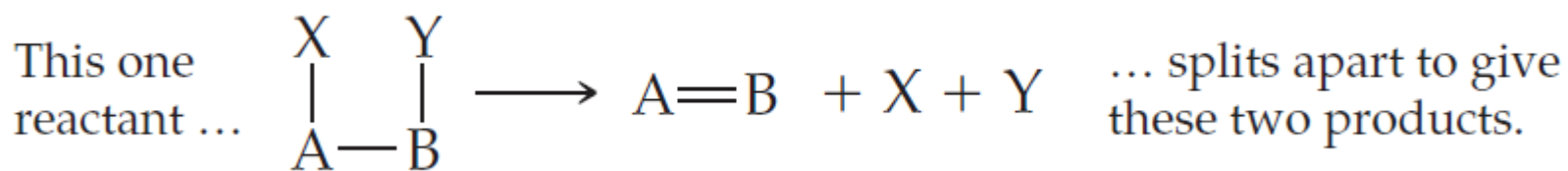
Addities (voorbeeld)



13.5 Types of Organic Reactions

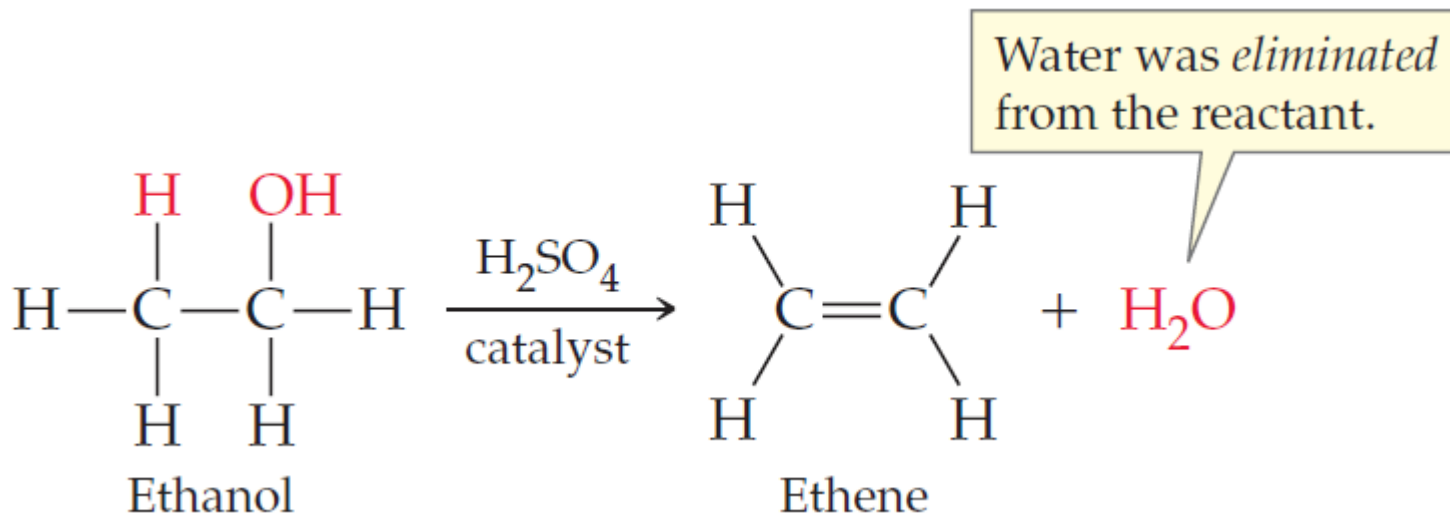
Eliminaties

- Tegenovergestelde van een additie



13.5 Types of Organic Reactions

Eliminaties (voorbeeld)



13.5 Types of Organic Reactions

Substitutie

- twee reactanten → 2 nieuwe producten

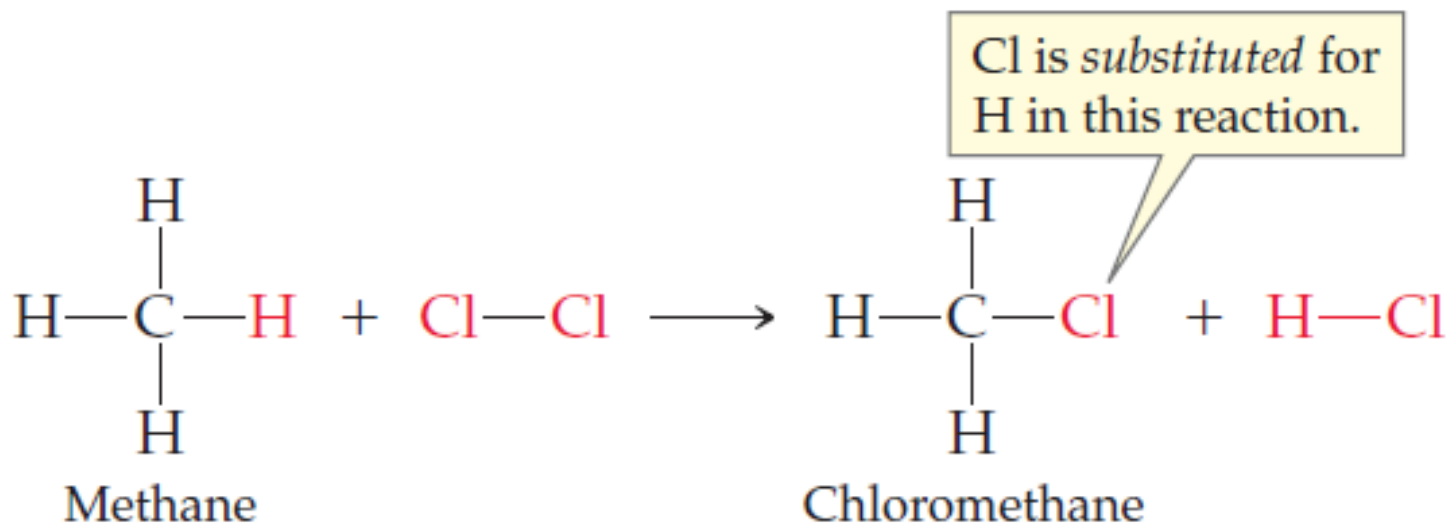
These two reactants
exchange parts ...



... to give these
two products.

13.5 Types of Organic Reactions

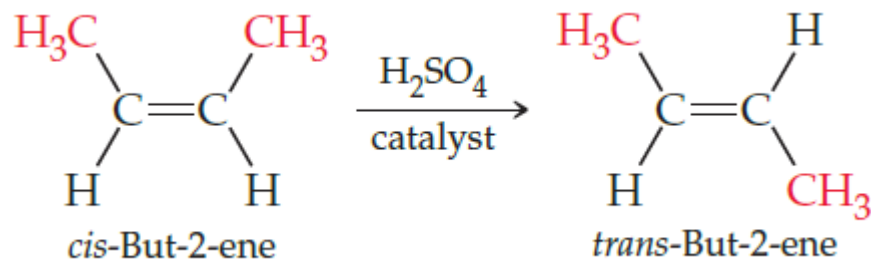
Substitutie (voorbeeld)



13.5 Types of Organic Reactions

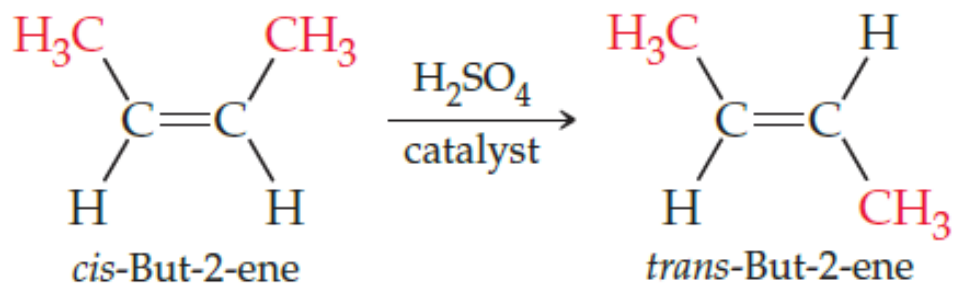
Herschikking

- Product is een isomeer van de reactant



13.5 Types of Organic Reactions

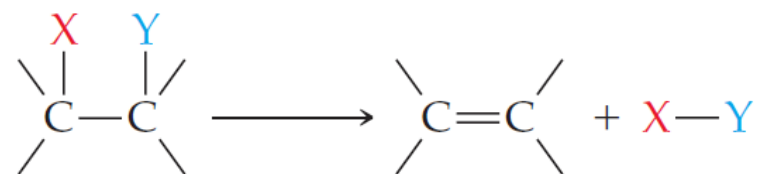
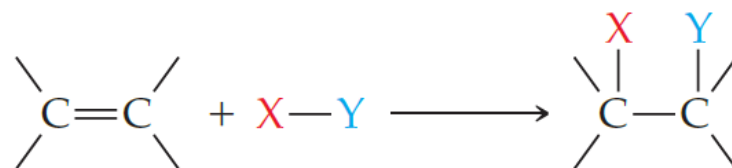
Herschikking (voorbeeld)



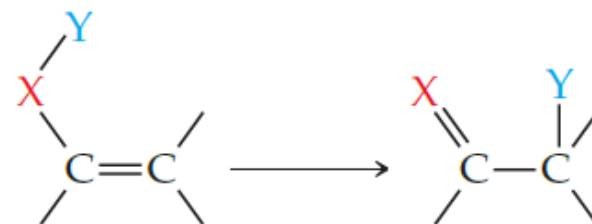
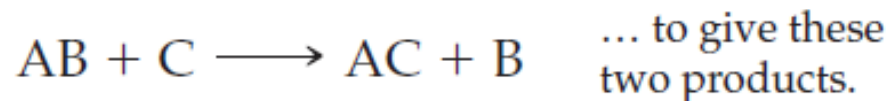
13.5 Types of Organic Reactions

4 typen organische reacties

- Addities (additions)
- Eliminaties (eliminations)
- Substituties (substitutions)
- Herschikkingen (rearrangements)



These two reactants
exchange parts ...

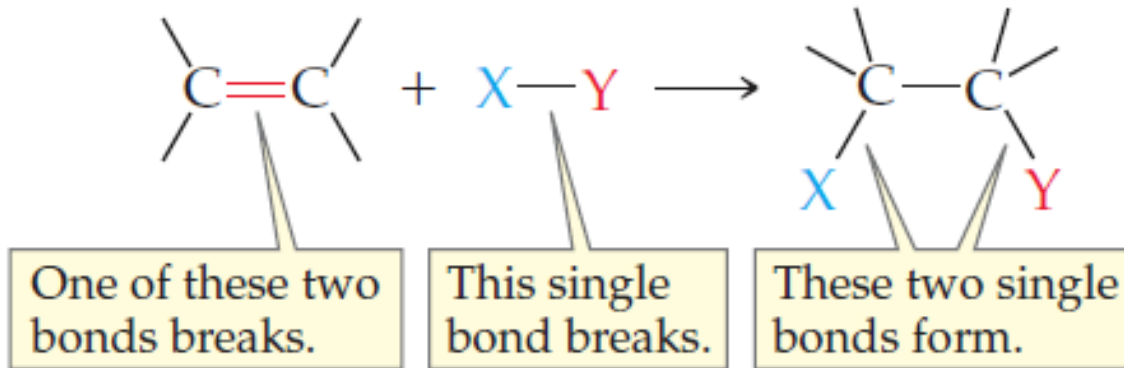


13.5 Types of Organic Reactions

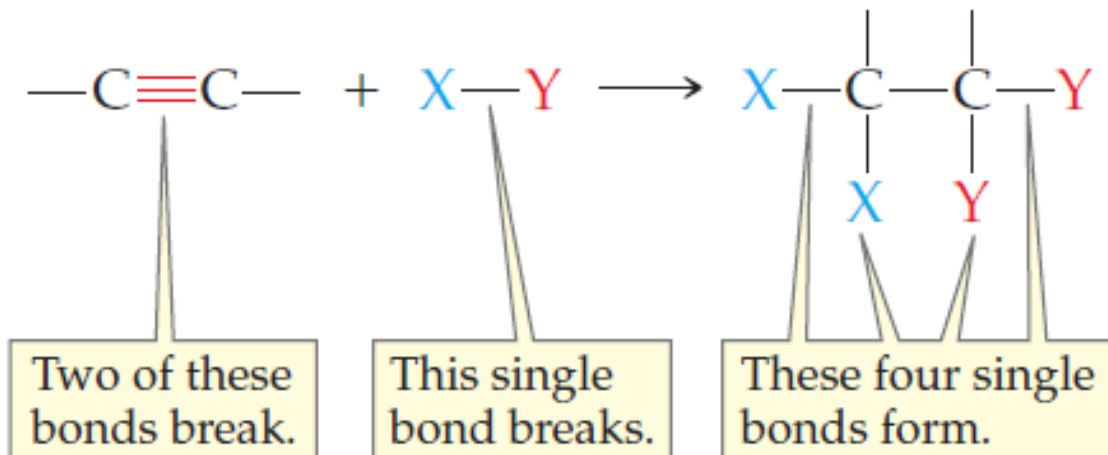
Nu

- Maken WE 13.4 en 13.7

13.6 Additie reacties van alkenen en alkynen



Addition reactions



13.6 Additie reacties van alkenen en alkynen

Hydrogenatie

- Reacties met waterstof

Halogenatie

- Reactie met een halogeen

Hydrohalogenatie

- Reacties met HBr en HCl

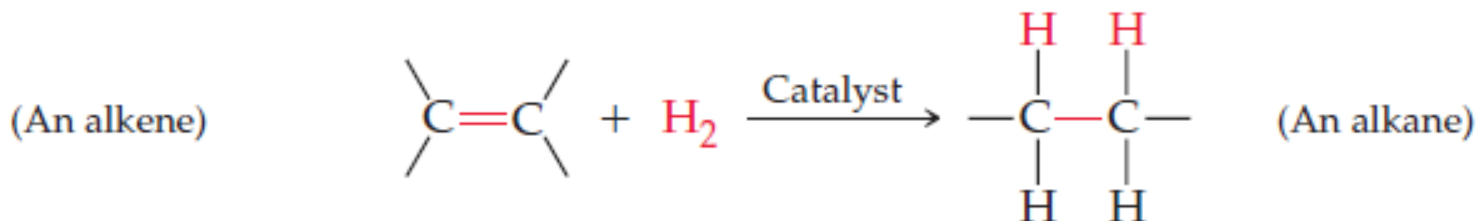
Hydratie

- Reactie met water

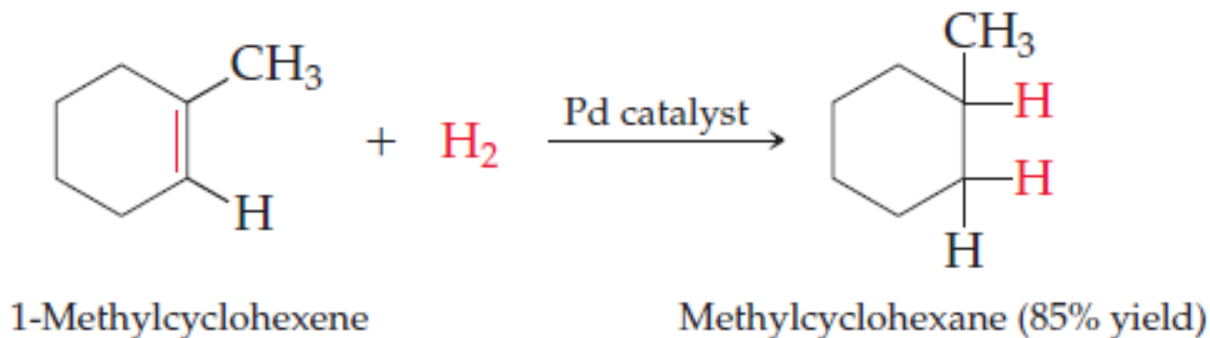
13.6 Additie reacties van alkenen en alkynen

Hydrogenatie

- Reacties met waterstof



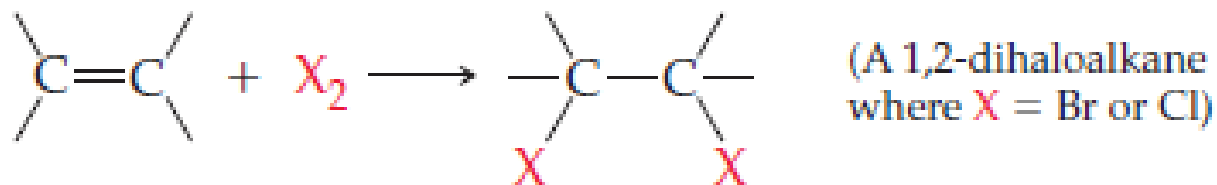
For example,



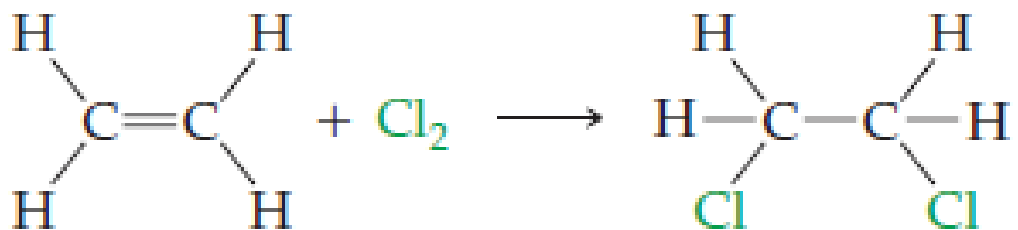
13.6 Additie reacties van alkenen en alkynen

Halogenatie

- Reactie met een halogeen



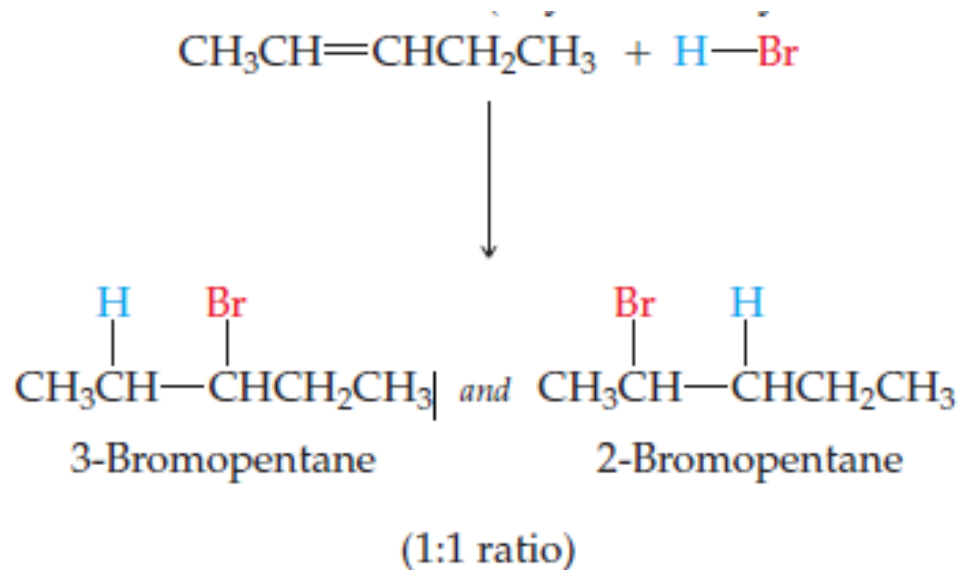
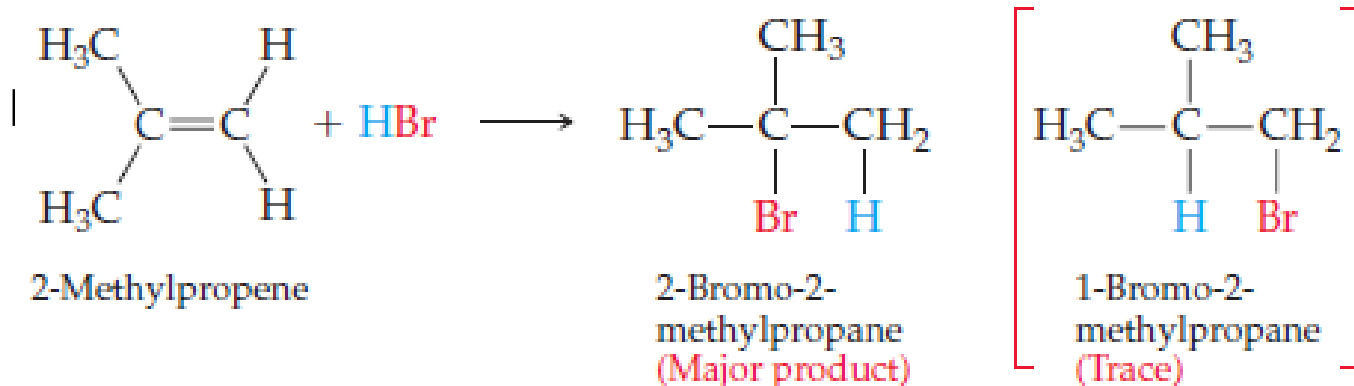
For example,



Ethene

1, 2-Dichloroethane

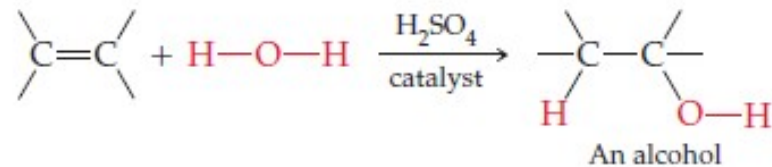
13.6 Additie reacties van alkenen en alkylenen



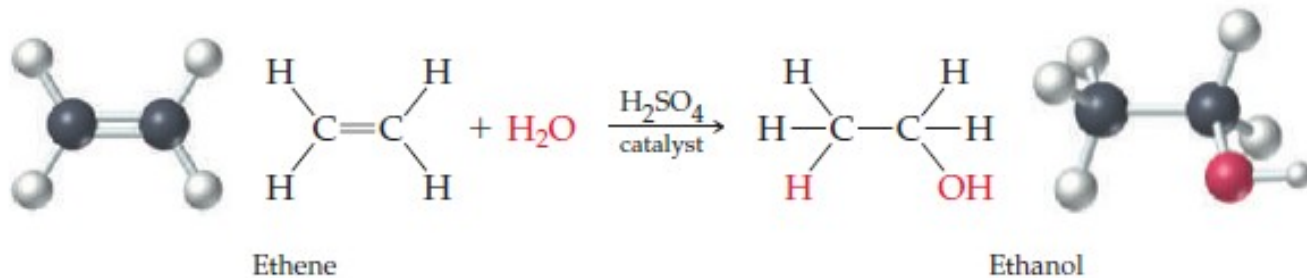
13.6 Additie reacties van alkenen en alkynen

Hydratie

- Reactie met water



For example,



13.6 Additie reacties van alkenen en alkynen

Hydrogenatie

- Reacties met waterstof

Halogenatie

- Reactie met een halogeen

Hydrohalogenatie

- Reacties met HBr en HCl

Hydratie

- Reactie met water

Nu

Maken t/m 13.16

Bronnen

Afbeeldingen afkomstig van:

- McMurry - Fundamentals of general, organic, and biological chemistry. 7th edition, uitgever: Pearson.
 - Veplicht boek boekenlijst opleiding