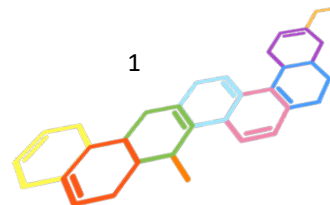
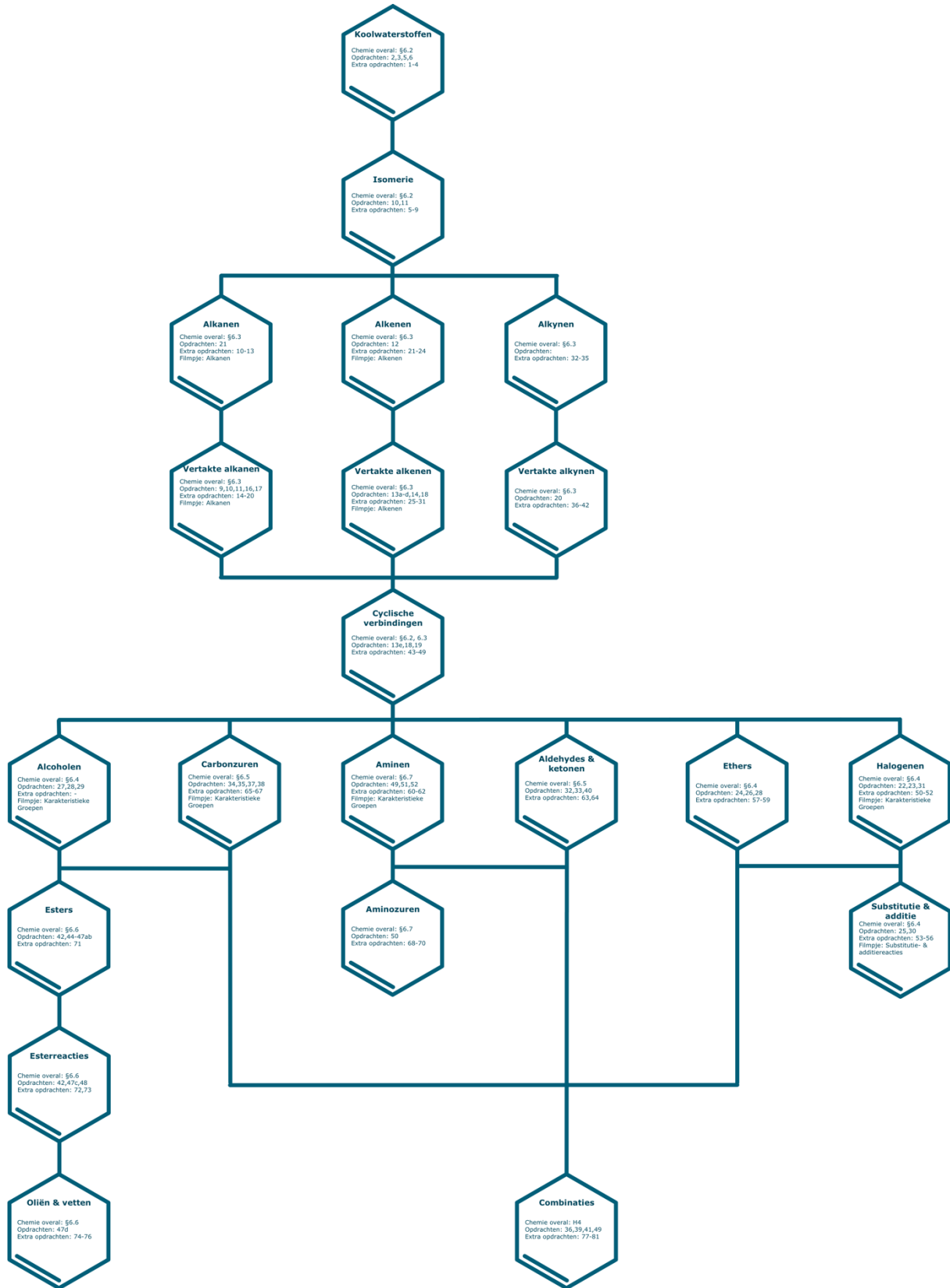
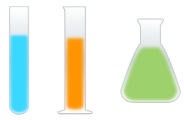
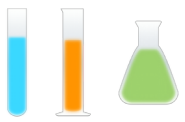


SCHEIKUNDE – VWO 4 – KOOLSTOFCHEMIE





KOOLWATERSTOFFEN



OPDRACHT 1

NIVEAU: 1



Stof A, E, F en G zijn alkanen. Ze voldoen aan de algemene formule C_nH_{2n+2} .

Stof B en D kunnen alkenen zijn. Ze voldoen aan de algemene formule C_nH_{2n} .

Stof C en H zouden meer dan 1 dubbele binding kunnen hebben en daarmee ook onder de alkenen kunnen vallen.

OPDRACHT 2

NIVEAU: 2



A verzadigd
B onverzadigd

C onverzadigd
D onverzadigd

OPDRACHT 3

NIVEAU: 2



Zie boek p. 179

OPDRACHT 4

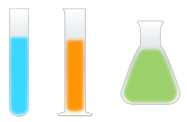
NIVEAU: 3



Tot welke homologe reeks(en) kunnen de volgende stoffen behoren?

A	Alkanen	C	Alkynen, cycloalkenen, alkadienen	E	Alkanen	G	Cycloalkynen, alkatrienen
B	Alkenen, cycloalkanen	D	Alkenen, cycloalkanen	F	alkanen	H	Alkenen, cycloalkanen





ISOMERIE



OPDRACHT 5

NIVEAU: 1



Wanneer ze dezelfde molecuulformule hebben, maar een verschillende structuurformule.

OPDRACHT 6

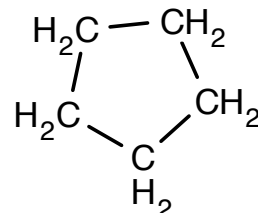
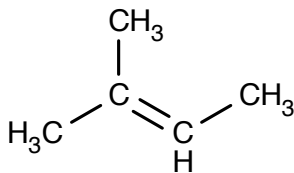
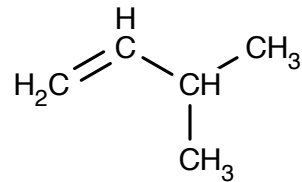
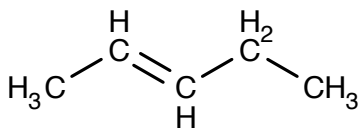
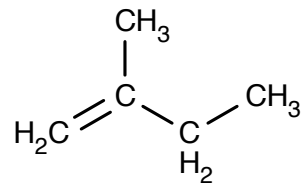
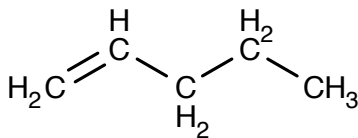
NIVEAU: 2

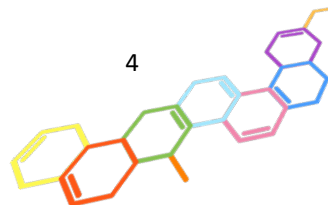
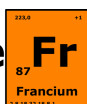
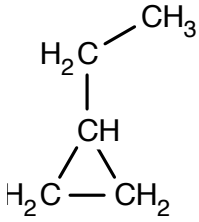
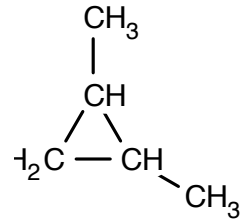
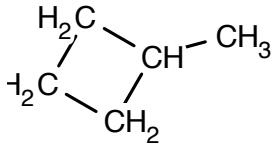


I en II

OPDRACHT 7

NIVEAU: 2







OPDRACHT 8

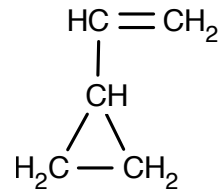
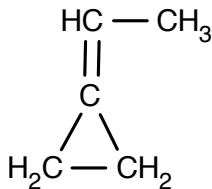
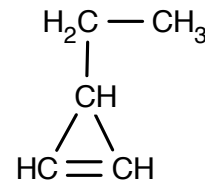
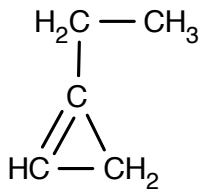
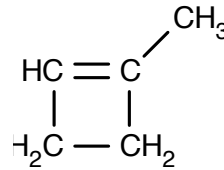
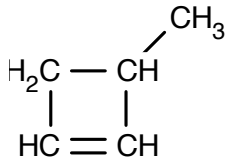
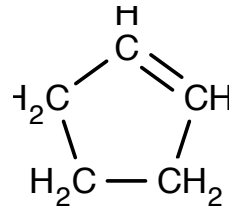
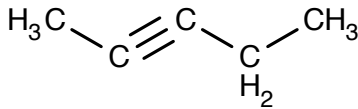
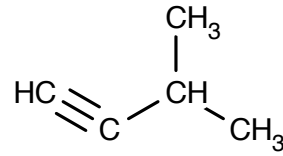
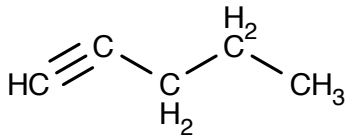
NIVEAU: 2

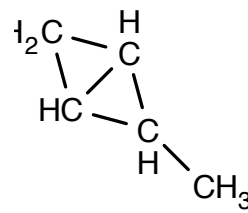
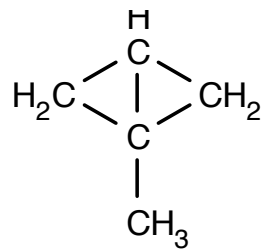
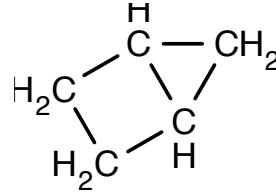
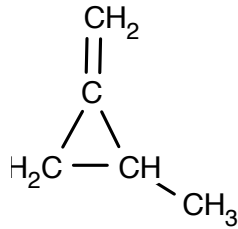
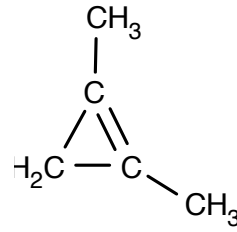
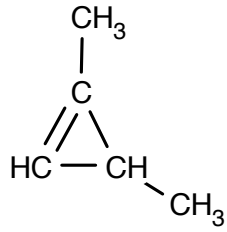


II en IV.

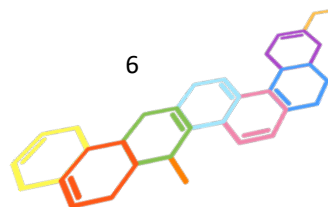
OPDRACHT 9

NIVEAU: 3

Tekenen alle mogelijke isomeren van C₅H₈.



Als je als eerste nog een nieuwe isomeer kan bedenken krijg je een lollie.





ALKANEN



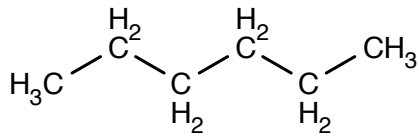
OPDRACHT 10

NIVEAU: 2

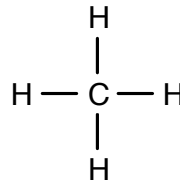


Teken de structuurformule van de volgende stoffen.

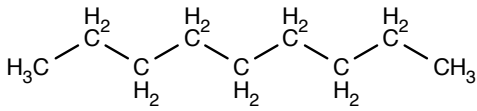
A



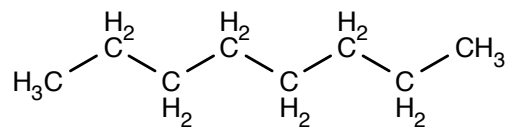
C



B



D



OPDRACHT 11

NIVEAU: 2



A ethaan
B heptaan

C propaan
D butaan



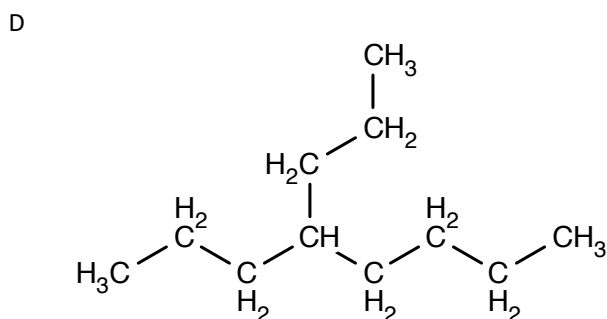
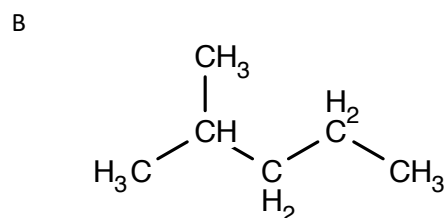
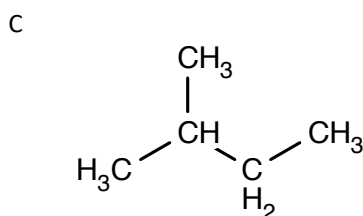
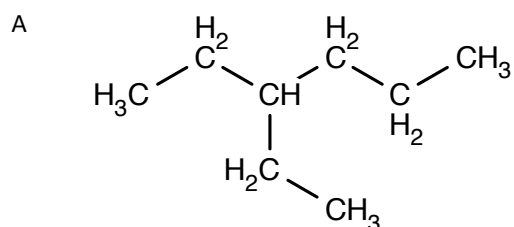


VERTAKTE ALKANEN



OPDRACHT 14

NIVEAU: 1



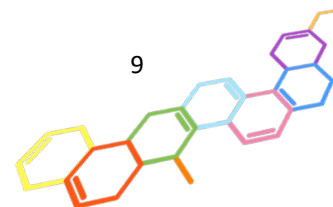
OPDRACHT 15

NIVEAU: 1



- A propaan
B methylpropaan

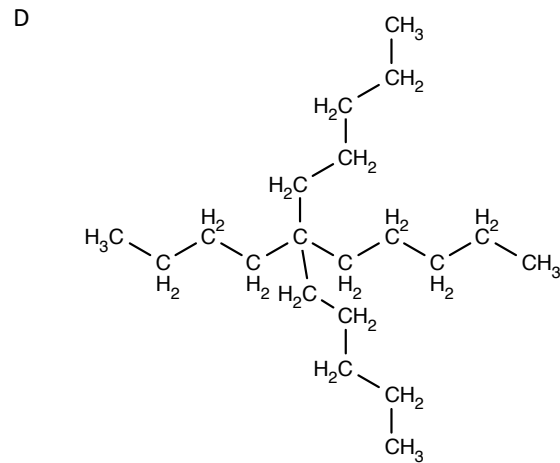
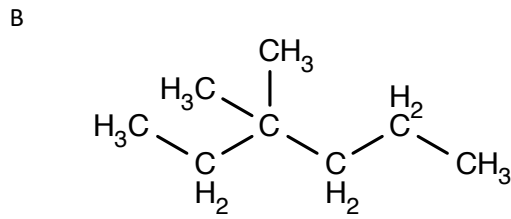
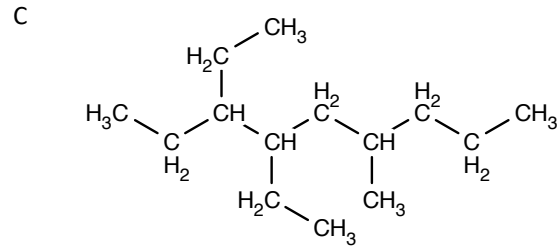
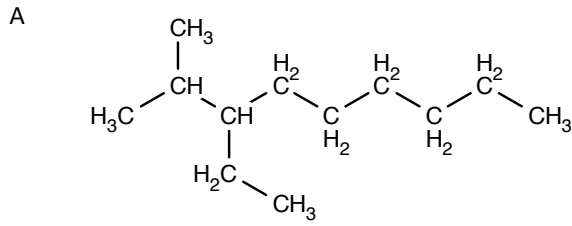
- C methylbutaan
D 2-methylpentaan





OPDRACHT 16

NIVEAU: 2



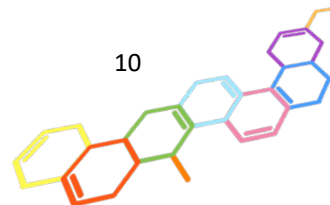
OPDRACHT 17

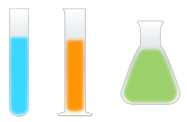
NIVEAU: 2



- A 4-ethyl-2,3-dimethylhexaan
 B 3,4-dimethylhexaan

- C 2,5-dimethyl-4-propylheptaan
 D 4,5,6-triethyl-3,7-dimethylnonaan



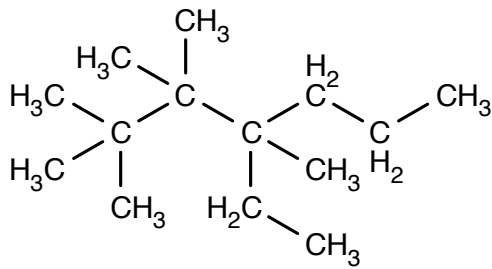


OPDRACHT 18

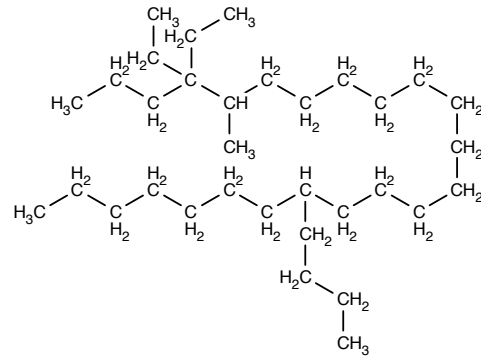
NIVEAU: 3



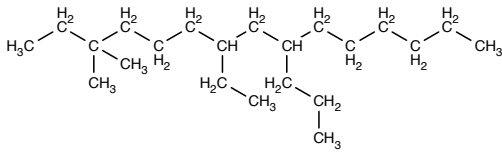
A



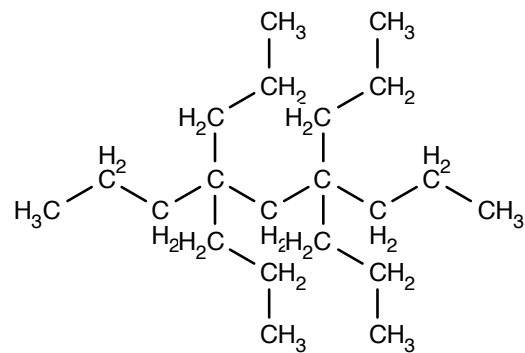
C



B



D



OPDRACHT 19

NIVEAU: 3



A 4,4,6,6-tetramethyl-8-propyldodecaan

C 3,5-diethyl-2,6-dimethylheptaan

B 2,2,3,4-tetramethylhexaan

D 3,7,8-triethyl-2,4,5-trimethyldecaan

OPDRACHT 20

NIVEAU: 3



A 2,4-dimethylhexaan

C methylpropan

B 3-propylhexaan

D 5,6-dibutyl-5,6-dipropyldecaan





ALKENEN

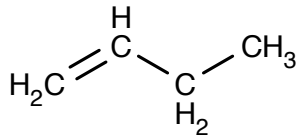


OPDRACHT 21

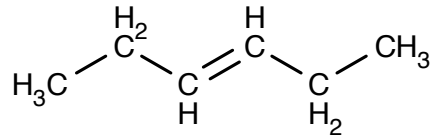
NIVEAU: 2



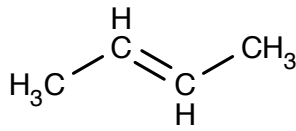
A



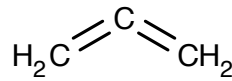
C



B



D



OPDRACHT 22

NIVEAU: 2



A Hex-3-een
B Pent-2-een

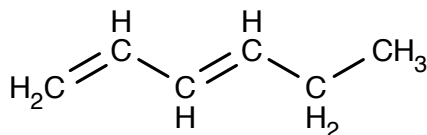
C Penta-1,3-dieen
D Pent-1-een

OPDRACHT 23

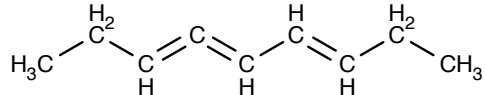
NIVEAU: 3



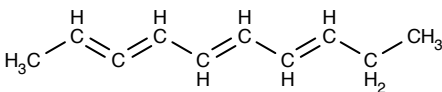
A



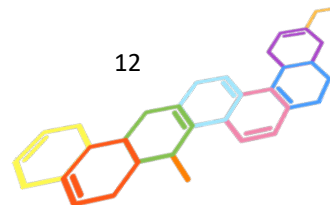
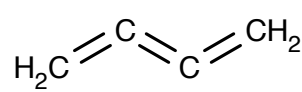
C



B



D





OPDRACHT 24

NIVEAU: 3



Geef de systematische namen van de volgende stoffen.

- A Hexa-2,3-dieen
- B Octa-2,5-dieen

- C Nona-1,3,8-trieen
- D Dodeca-1,3,5,7-tetraeen





VERTAKTE ALKENEN

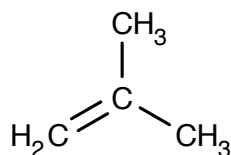


OPDRACHT 25

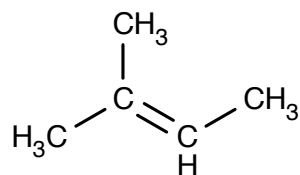
NIVEAU: 1



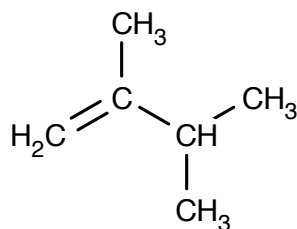
A



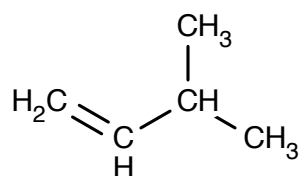
C



B



D



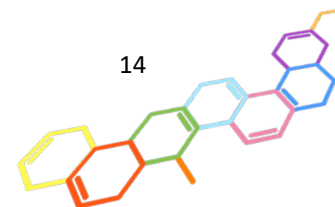
OPDRACHT 26

NIVEAU: 1



- A 3-methylbut-1-een
B 2-methylpent-2-een

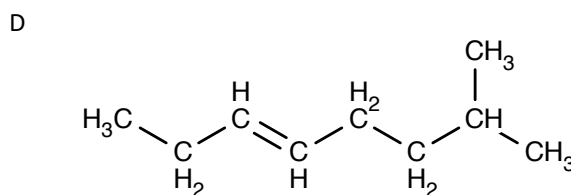
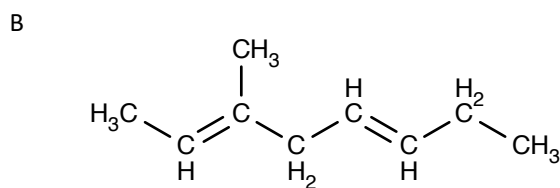
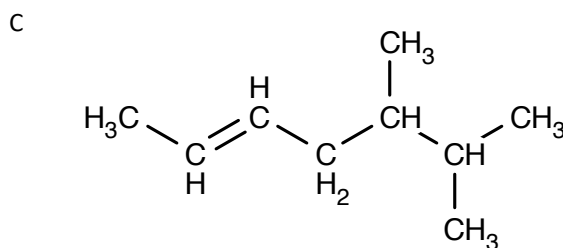
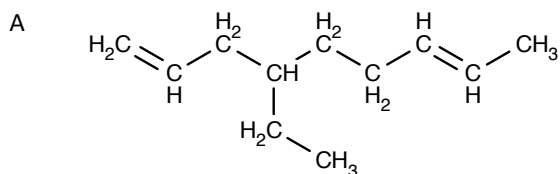
- C methylpropeen
D 3-methylpent-2-een





OPDRACHT 27

NIVEAU: 2



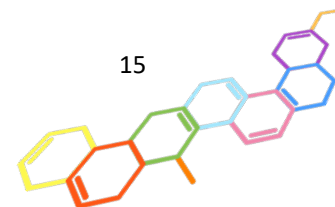
OPDRACHT 28

NIVEAU: 2



- A 2-methylbut-1-een
 B 3,4-dimethylpenta-1,3-dieen

- C 5,6-dimethylhept-2-een
 D 3-ethyl-2-methylpenta-1,3-dieen



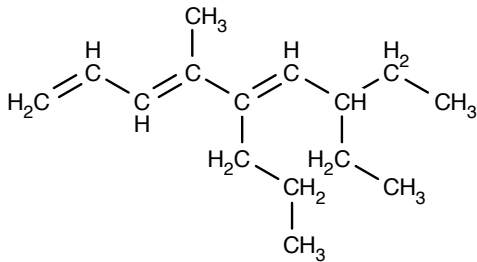


OPDRACHT 29

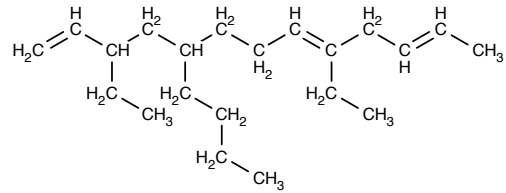
NIVEAU: 3



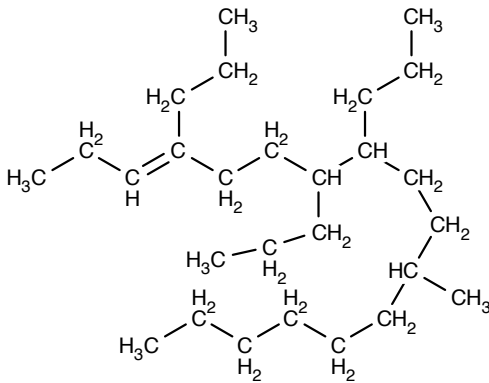
A



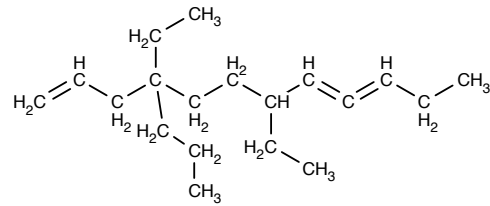
C



B



D



OPDRACHT 30

NIVEAU: 3



- A 3-ethyl-4,7-dimethylnona-1,3,5-trieen
 B 3,4,5-triethylhept-3-een

- C 3-methylhexa-1,3,5-trieen
 D 7-butyl-6-propylundeca-1,4-7-trieen

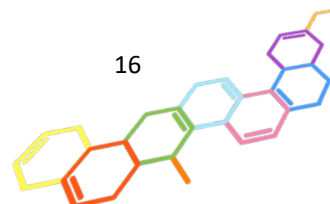
OPDRACHT 31

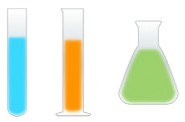
NIVEAU: 3



- A Hepta-1,4,5-trieen
 B methylbut-2-een

- C 3-ethyl-4,4-dimethylpent-2-een
 D But-1-een





ALKYENEN



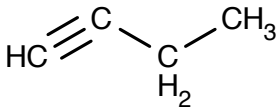
OPDRACHT 32

NIVEAU: 2

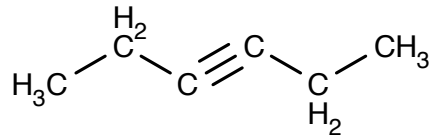


Teken de structuurformule van de volgende stoffen.

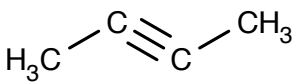
A



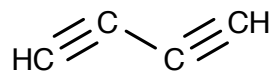
C



B



D



OPDRACHT 33

NIVEAU: 2



- A Ethyn
B But-2-yn

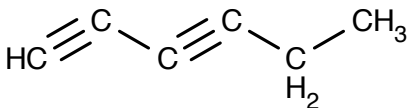
- C Pentadiyn
D Propyn

OPDRACHT 34

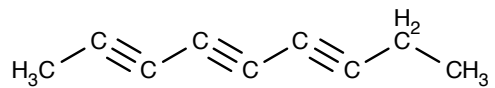
NIVEAU: 3



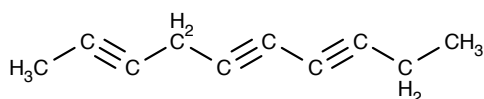
A



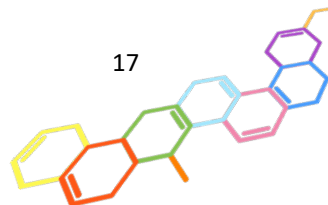
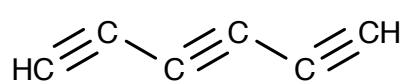
C



B



D





OPDRACHT 35

NIVEAU: 3



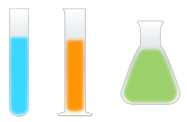
A Hepta-1,3,6-triyn

B Nona-2,6-diyn

C Hex-2-yn

D Octa-2,5-diyn





VERTAKTE ALKYNEN

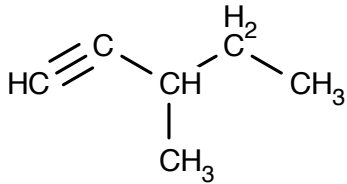


OPDRACHT 36

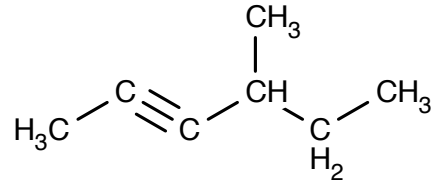
NIVEAU: 1



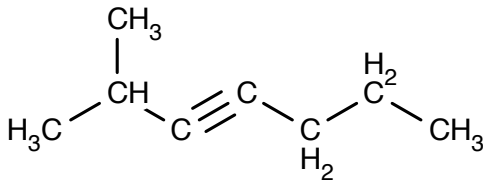
A



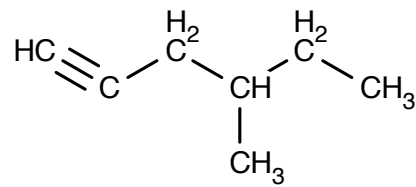
C



B



D



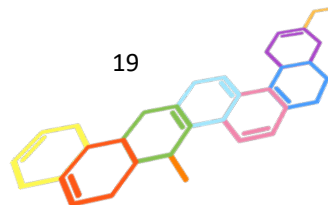
OPDRACHT 37

NIVEAU: 1



- A Methylbutyn
B Methylbutyn

- C 4,5-dimethylhex-2-yn
D Ethylpentyn



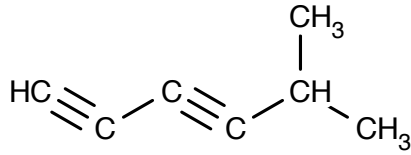


OPDRACHT 38

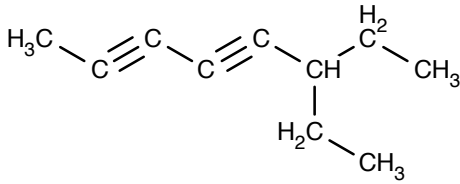
NIVEAU: 2



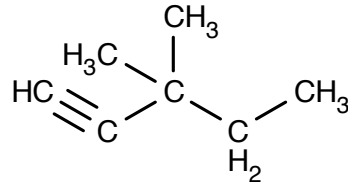
A



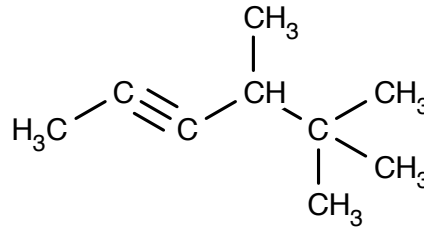
B



C



D



OPDRACHT 39

NIVEAU: 2



- A 3,3-dimethylpenta-1.4-diyne
B 2,5-dimethylhex-3-yn

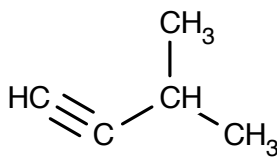
- C 3-methylpent-1-yn
D 4-ethylhepta-2,5-diyne

OPDRACHT 40

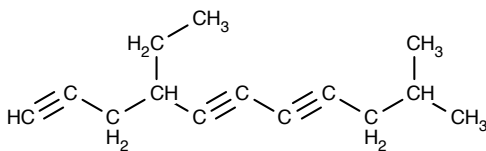
NIVEAU: 3



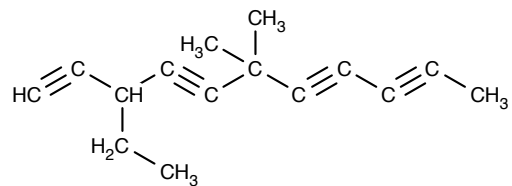
A



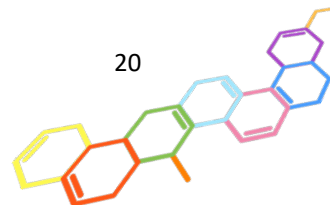
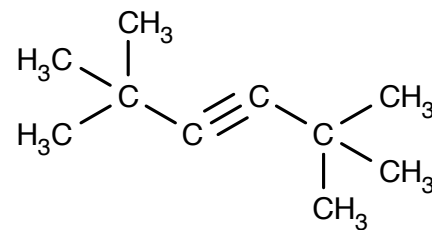
B



C



D





OPDRACHT 41

NIVEAU: 3



- | | | | |
|---|---------------------------------|---|---|
| A | 4-ethyl-5-methylocta-2,6-diyne | C | 3,6,7-triethyl-8-methyldeca-1,4-diyne |
| B | 4,6-diethyl-8-propylundec-1-yne | D | 8,11-diethyl-7-hexylpentadeca-5,9-diyne |

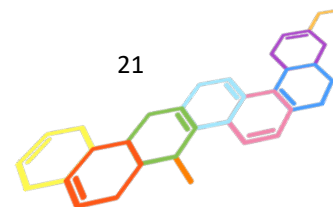
OPDRACHT 42

NIVEAU: 3



Frits heeft een aantal stoffen een verkeerde naam gegeven. Help Frits en geef de goede naam van de stoffen.

- | | | | |
|---|-----------------|---|--------------------------------|
| A | hepta-1,3-diyne | C | 4-methylhex-1-yne |
| B | butadiyne | D | 6-ethyl-4,6-dimethylocta-2-yne |



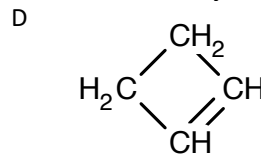
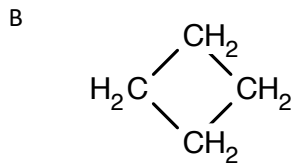
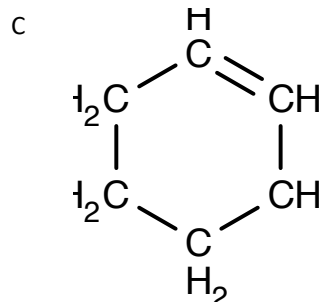
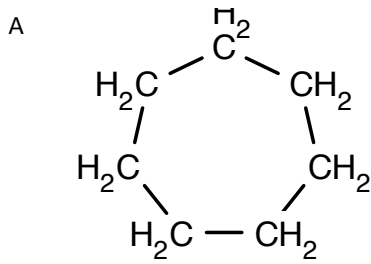


CYCLISCHE VERBINDINGEN



OPDRACHT 43

NIVEAU: 1



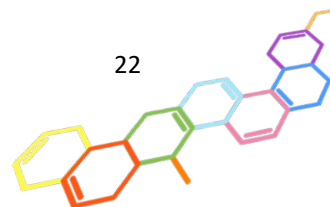
OPDRACHT 44

NIVEAU: 1



- A Cyclononaan
- B Cyclohexaan

- C Cyclopentaaan
- D Cyclopenteen



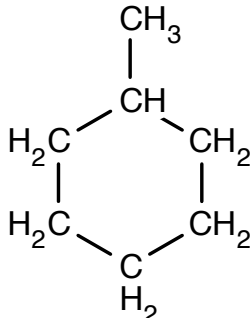


OPDRACHT 45

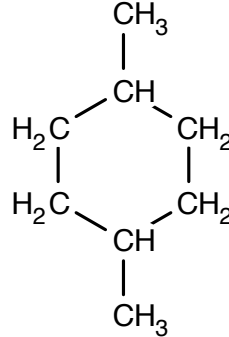
NIVEAU: 2



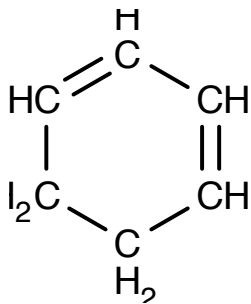
A



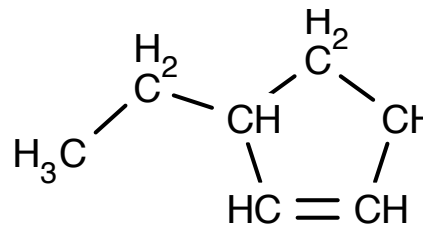
C



B



D



OPDRACHT 46

NIVEAU: 2



A

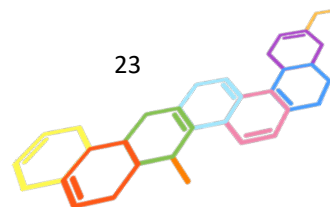
1,3-dimethylcyclobutaan

C 1,2,4-trimethylcyclopentaaan

B

Cyclohexa-1,3,5-trieen

D Cyclopentyn



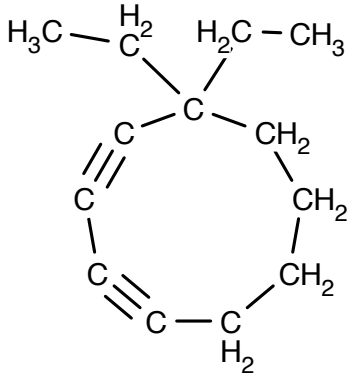


OPDRACHT 47

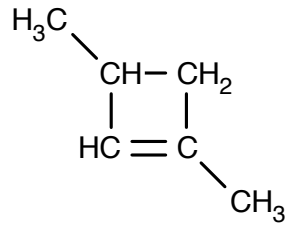
NIVEAU: 3



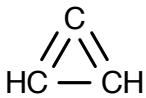
A



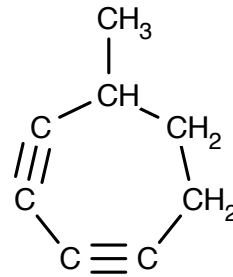
C



B



D



OPDRACHT 48

NIVEAU: 3



- A 1,5-dimethylcyclopenta-1,3-dieen
 B 3,7-dimethylcyclohepta-1,4-diyen

- C 1,5-dimethylcyclopenta-1,2,3,4-tetraeen
 D 3-ethyl-6-methylcyclohexa-1,4-diyen

OPDRACHT 49

NIVEAU: 3



- A 5-methylcyclo-octa-1,2,4-trieen
 B cyclopenta-1,3-diyen

- C 1,3,5-triethylcyclohex-1-een
 D 4-methylcyclohexa-1,3-dieen





HALOGENEN

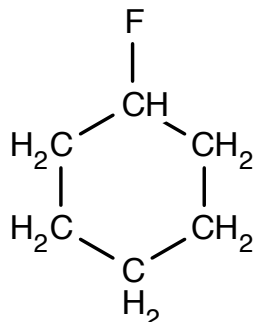


OPDRACHT 50

NIVEAU: 1

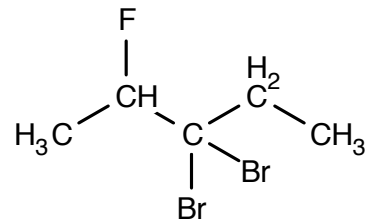


A



B 2-broom-5-fluorhexaan

C



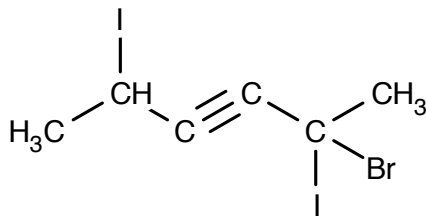
D 3,3,4-trifluorhexaan

OPDRACHT 51

NIVEAU: 2

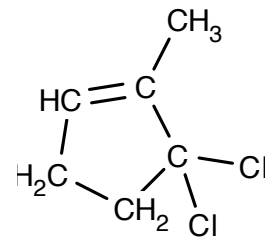


A



B 1,3-dibroom-2-methylbut-2-ene

C



D 3,4-difluor-5-methylcyclopent-1-ene

OPDRACHT 52

NIVEAU: 3



A 1-broom-3-fluorcyclohexaan

B 5-fluorcyclopenta-1,3-dien

C 1-broom-3-fluorpenta-1,3-dien

D 1,2,3-trifluor-1,4,6-trimethylcycloheptaan





SUBSTITUTIE & ADDITIE



OPDRACHT 53

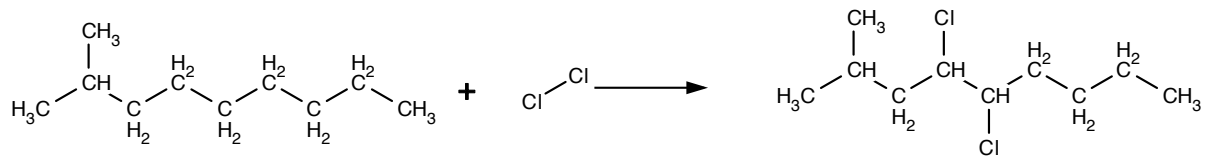
NIVEAU: 1



- A Additie, rondom de dubbele binding worden atomen toegevoegd (geaddeerd) en er worden geen atomen vervangen.
- B Substitutie, er worden atomen vervangen.

OPDRACHT 54

NIVEAU: 2



Er wordt gebruik gemaakt van een additiereactie, er worden namelijk atomen toegevoegd en geen atomen vervangen. Je moet van een additiereactie gebruik maken omdat je bij een substitutiereactie niet weet welke waterstofatomen vervangen gaan worden, waardoor je een mengsel van verschillende chloornonanen zou krijgen.



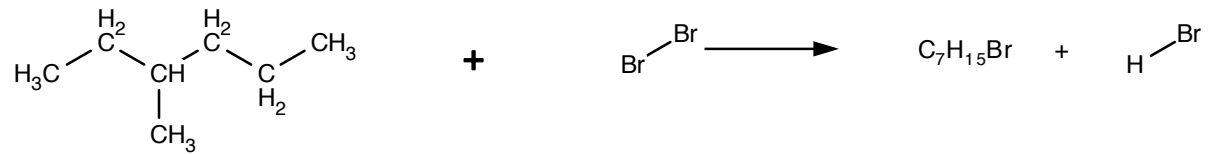


OPDRACHT 55

NIVEAU: 2

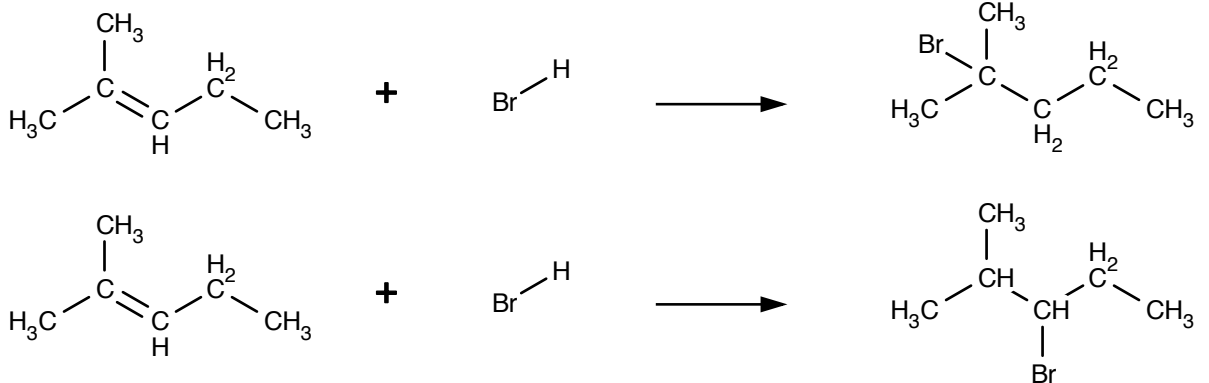


A.



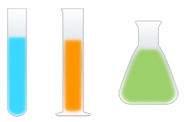
Je kan geen structuurformule geven van $\text{C}_7\text{H}_{15}\text{Br}$ omdat je niet weet welk H-atoom gesubstitueerd wordt.

B.



Er kunnen twee verschillende producten gevormd worden. Die kan je samen in een reactievergelijking zetten (vergeet hem dan niet kloppend te maken) of in twee losse vergelijkingen.



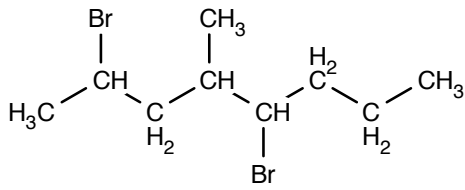


OPDRACHT 56

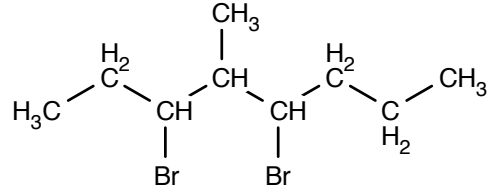
NIVEAU: 3



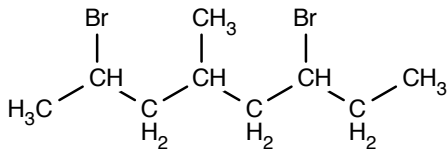
I



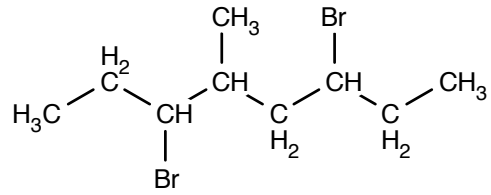
III



II



IV





ETHERS



OPDRACHT 57

NIVEAU: 1



- | | | | |
|---|---------------|---|-------------------|
| A | Methoxyethaan | C | 1-Methoxybutaan |
| B | Ethoxyethaan | D | 1-Propoxypentaaan |

OPDRACHT 58

NIVEAU: 2



- | | | | |
|---|----------------------------|---|-------------------------------|
| A | 3-methoxypentaaan | C | 2-ethoxy-3-methylbutaan |
| B | 1,3-dimethoxycyclopentaaan | D | 1-ethoxy-2-methoxycyclohexaan |

OPDRACHT 59

NIVEAU: 3



- | | | | |
|---|-------------------------------|---|-----------------------------------|
| A | 1-ethoxy-3-methoxycyclohexaan | C | methoxyethaan |
| B | 3-methyl-2-propoxypentaaan | D | 1,1,2,4-tetramethoxycyclopentaaan |



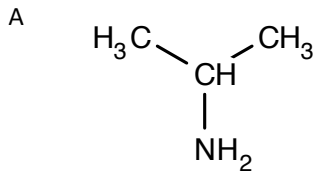


AMINEN

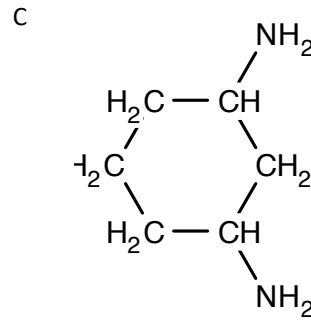


OPDRACHT 60

NIVEAU: 1



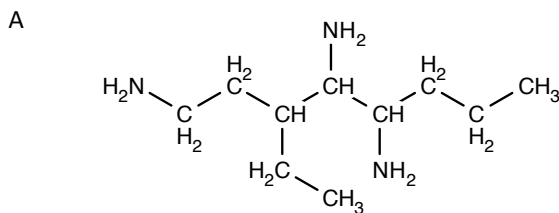
B Cyclopentaamine



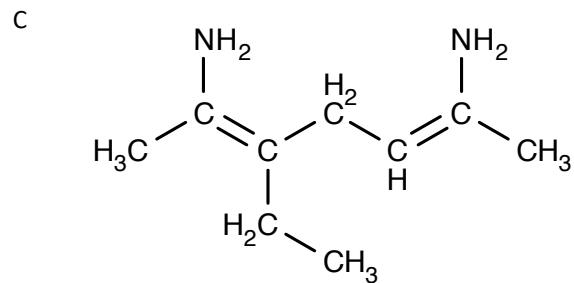
D But-2-een-1-amine

OPDRACHT 61

NIVEAU: 2



B Cyclopenta-1,3-dien-1,3-diamine



D But-3-yn-1,1,4-triamine

OPDRACHT 62

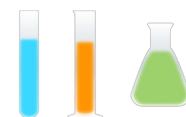
NIVEAU: 3



A cyclohex-4-een-1,2,4-triamine
B octa-1,2,8-triamine

C ethaanamine
D cyclobutaan-1,2-diamine





ALDEHYDES & KETONEN



OPDRACHT 63

NIVEAU: 2



Zet van de onderstaande stoffen de structuurformule om in een systematische naam.

- | | | | |
|---|-----------------|---|---------------------|
| A | Ethanal | C | 3-methylbutaan-2-on |
| B | Hexaan-3,4-dion | D | 6-oxoheptanal |

OPDRACHT 64

NIVEAU: 3



- | | | | |
|---|--------------|---|---------------------|
| A | propanal | C | cyclohexanon |
| B | 3-oxobutanal | D | cyclohex-3-een-1-on |





CARBONZUREN



OPDRACHT 65

NIVEAU: 1



- A Propaanzuur
- B Methaanzuur

- C Butaanzuur
- D Ethaanzuur

OPDRACHT 66

NIVEAU: 2



- A Propaandizuur
- B Ethaandizuur

- C 4,4-dimethylpentaanzuur
- D 2-methylbutaanzuur

OPDRACHT 67

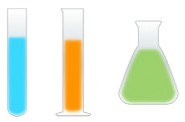
NIVEAU: 3



- A Benzeencarbonzuur
- B 2,4-dimethylpent-3-eenzuur

- C Cyclopentaancarbonzuur
- D Penta-2,3-dieendizuur





AMINOZUREN



OPDRACHT 68

NIVEAU: 1



Geef aan wat de 3 letterige afkorting van de volgende aminozuren is.

- | | | | |
|---|-----|---|-----|
| A | Asn | C | Leu |
| B | Gln | D | Pro |

OPDRACHT 69

NIVEAU: 2



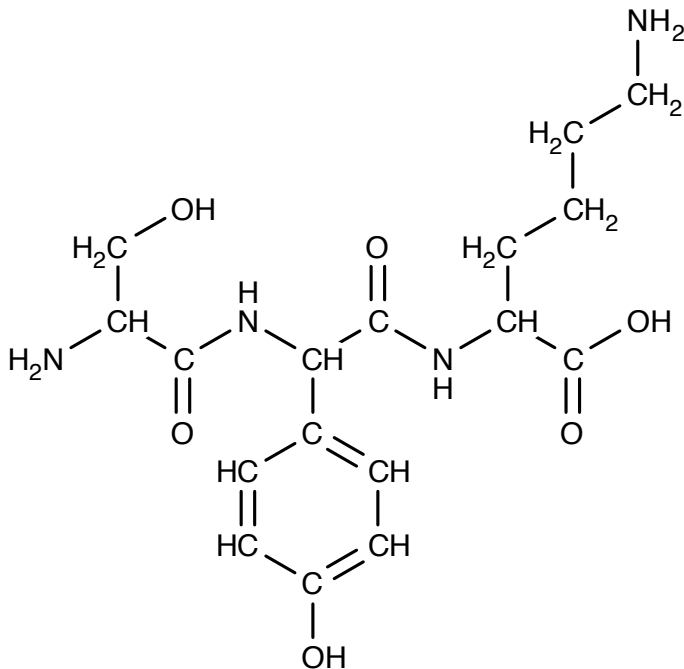
- | | | | |
|---|----------------------------|---|-----------------------------|
| A | 2-amino-3-methylbutaanzuur | C | 2-amino-3-methylpentaanzuur |
| B | 2-aminopentaanzuur | D | 2,6-diaminohexaanzuur |

OPDRACHT 70

NIVEAU: 3



Product van de reactie:





ESTERS



OPDRACHT 71

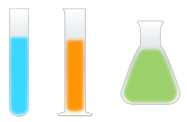
NIVEAU: 2



- A Propylpentanoaat
- B Methylethanoaat

- C Propylmethanoaat
- D Methylpentanoaat





ESTERREACTIES



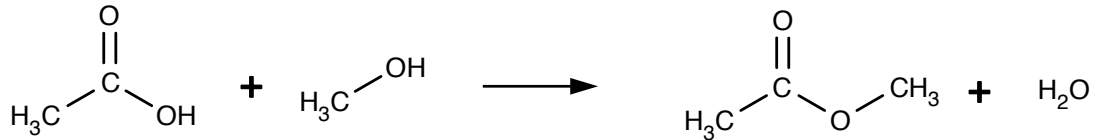
OPDRACHT 72

NIVEAU: 2

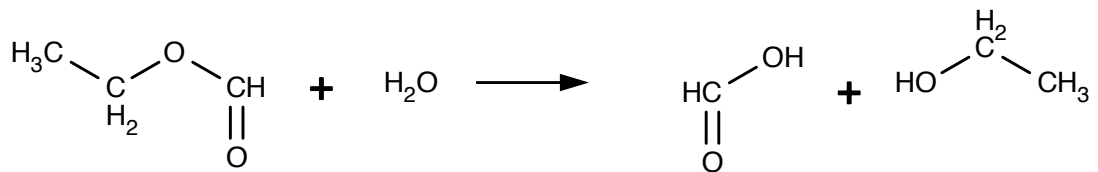


Teken de reactievergelijking in structuurformules van de volgende reactie

A



B



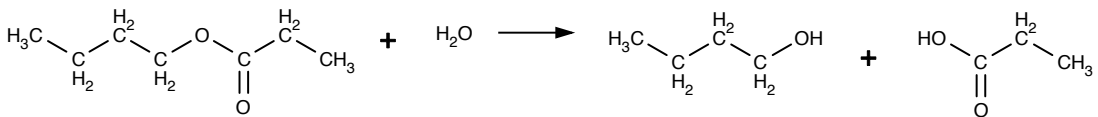
OPDRACHT 73

NIVEAU: 3

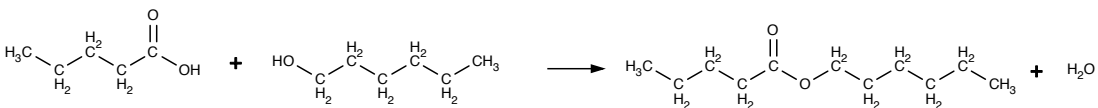


Teken de reactievergelijking in structuurformules van de volgende reactie

A



B





OLIËN & VETTEN



OPDRACHT 74

NIVEAU: 1



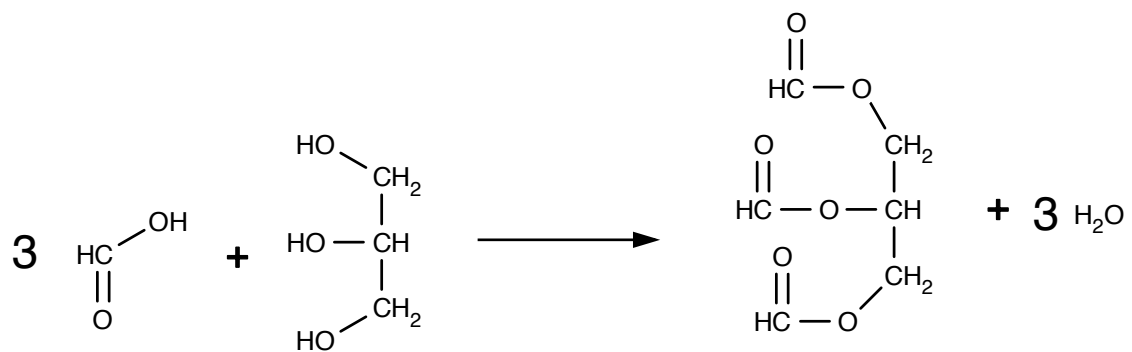
Als een vet een dubbele binding tussen twee koolstofatomen in de C-keten van een van de staarten heeft (het vetzuur waaruit het op is gebouwd had dus een dubbele binding) is het een onverzadigd vet. In dat geval zal het vet vloeibaar zijn bij kamertemperatuur. Als het alleen enkele bindingen tussen de koolstofatomen heeft is het een verzadigd vet en zal het vast zijn bij kamertemperatuur.

OPDRACHT 75

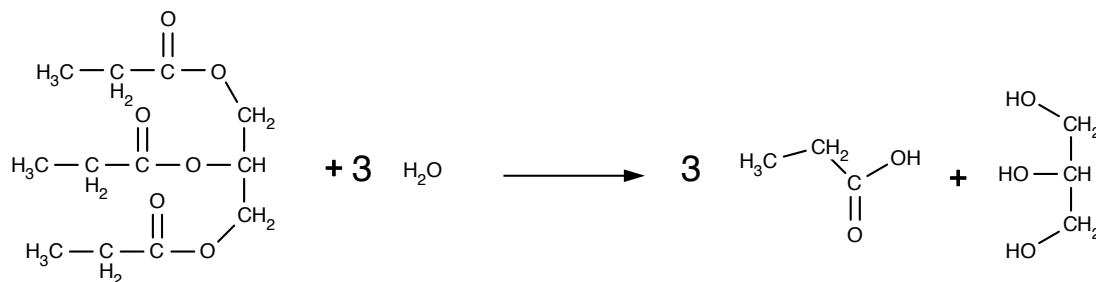
NIVEAU: 2



A

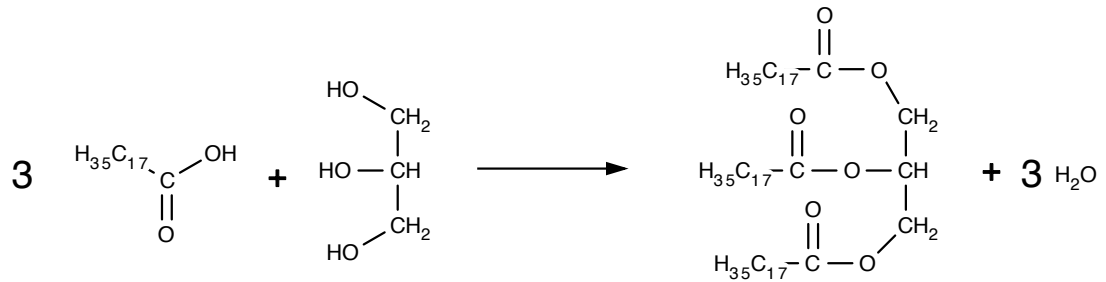


B

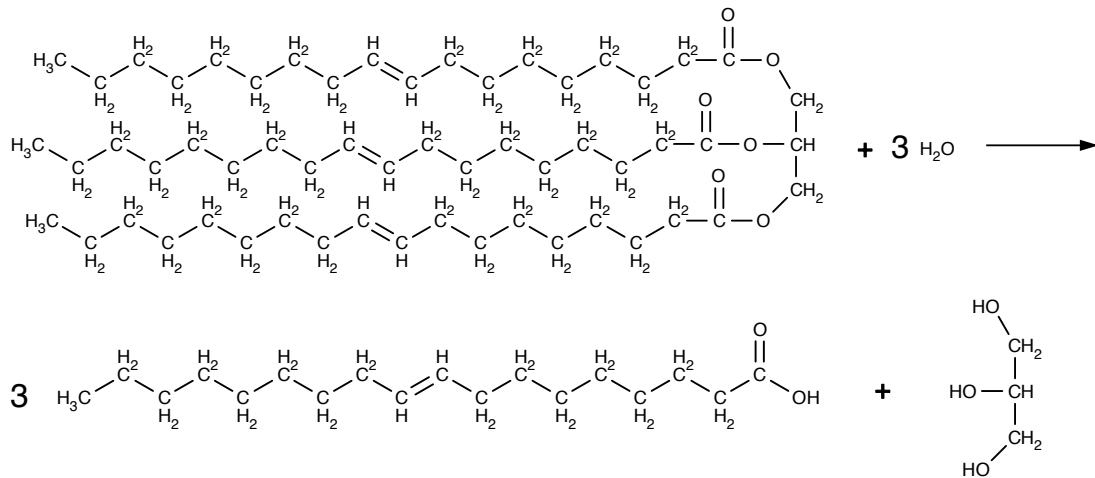




A



B



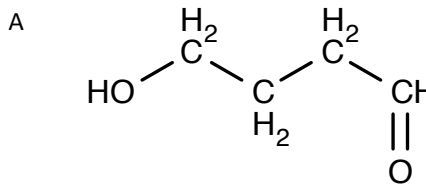


COMBINATIES

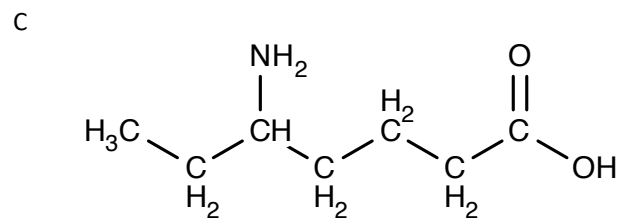


OPDRACHT 77

NIVEAU: 1



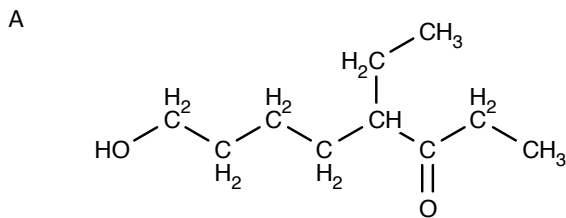
B 1-aminopentaaan-3-on



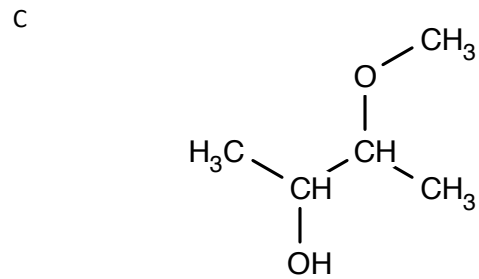
D Methoxymethanol

OPDRACHT 78

NIVEAU: 1



B 3-amino-2-chloor-1-fluorpropaan-1-ol



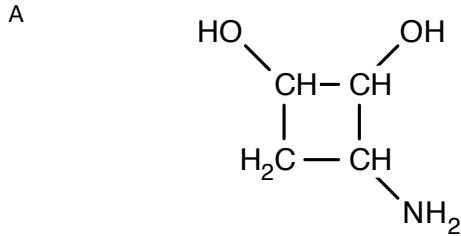
D 3-hydroxybutaanzuur



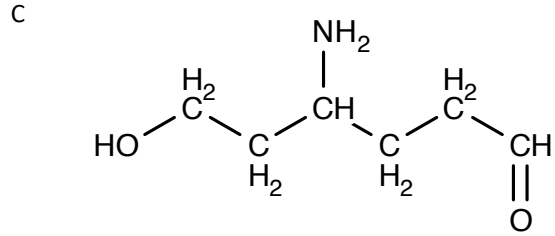


OPDRACHT 79

NIVEAU: 2



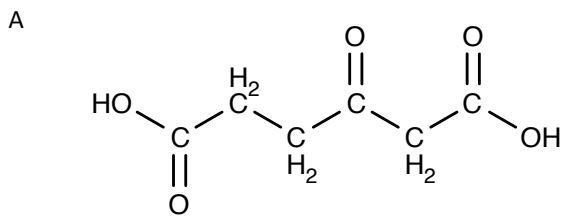
B 4-hydroxycyclopent-2-een-1-on



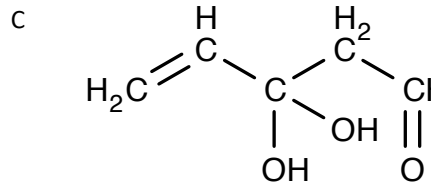
D 2-fluorhept-3-ynzuur

OPDRACHT 80

NIVEAU: 2



B 4-amino-2-chloorpentaan-1,4-diol



D 2,6-diaminocyclohex-3-een-1-on

OPDRACHT 81

NIVEAU: 3



A 4-hydroxyhexanal

C 5-hydroxypent-3-een-2-on

B 3,5-diamino-4-hydroxycyclohexanon

D 1-ethoxybutaan-2-on

