

Inovace bakalářského studijního oboru Aplikovaná chemie

<http://aplchem.upol.cz>

CZ.1.07/2.2.00/15.0247

Tento projekt je spolufinancován
Evropským sociálním fondem a státním
rozpočtem České republiky.



evropský
sociální
fond v ČR



EVROPSKÁ UNIE



MINISTERSTVO ŠKOLSTVÍ,
MLÁDEŽE A TĚLOVÝCHOVY



OP Vzdělávání
pro konkurenceschopnost



OKRESNÍ HOSPODÁŘSKÁ
KOMORA OLOMOUČ

INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

Názvosloví organických sloučenin:

Doporučená literatura:

Fikr J., Kahovec J.: Názvosloví organické chemie, Rubico Olomouc (2002)

Panico R., Powel W.H.: Průvodce názvoslovím organických sloučenin podle IUPAC, Academia Praha (2000)

www.iupac.org

Název
organické
látky

triviální – kyselina mravenčí, jantarová, octová, močovina...

systematický (racionální) – vytvořen na základě daných principů

Princip pojmenování:

předpony-**hlavní skelet** (uhlovodík nebo heterocyklus)-**přípona**

2-chlor-2,4-dimethylhexan-3-on

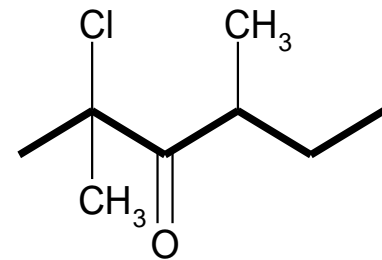
hl. skelet

přípona

lokanty

Předpony
(substituenty)

násobící předpona



Názvosloví základních skeletů:

1) nasycený nevětvený alifatický uhlovodík

2) nasycený alicyklický uhlovodík

3) aromatický uhlovodík

4) heterocyklus

Násobek	Jednoduchý substituent	Složitější substituent
1	mono-	-
2	di-	bis-
3	tri-	tris-
4	tetra-	tetrakis-
5	penta-	pentakis-
6	hexa-	hexakis-
7	hepta-	heptakis-
8	okta-	oktakis-
9	nona-	nonakis-
10	deka-	dekakis-
11	undeka-	undekakis-
12	dodeka-	dodekakis-
13	trideka-	tridekakis-
20	ikosa-	ikosakis-
21	heneikosa-	heneikosakis-

Ad 1) Alkany C_nH_{2n+2}

koncovka -an

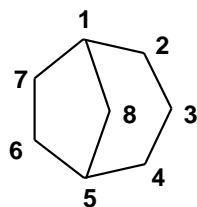
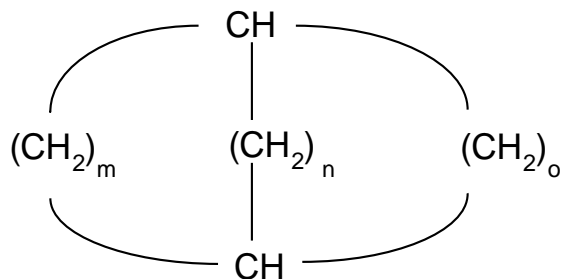
uhlovodík -H: **alkyl R-**

uhlovodík -2H: **alkyliden R=**

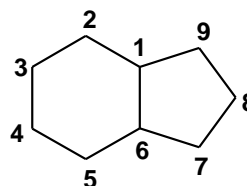
Ad 2) Cykloalkany C_nH_{2n}

předpona cyklo (cyklobutan, cyklopentan.....)

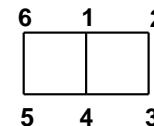
Vícecyklické : -můstkové



bicyklo[3.2.1]oktan

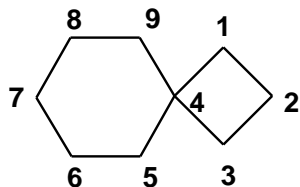


bicyklo[4.3.0]nonan

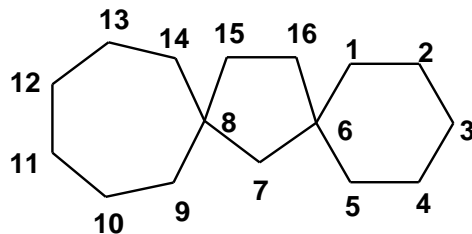


bicyklo[2.2.0]hexan

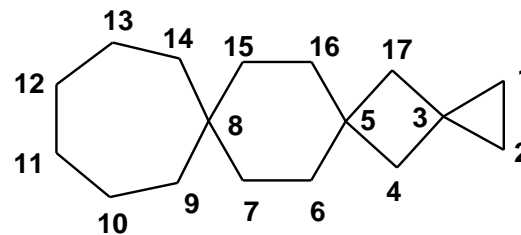
-spirocyklické



spiro[3.5]nonan

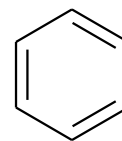


dispiro[5.1.6.2]hexadekan

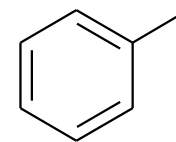


trispiro[2.1.2.6.2.1]heptadekan

Ad 3) Aromatické uhlovodíky

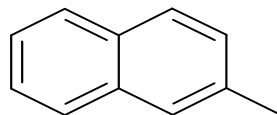
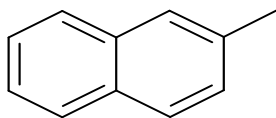


benzen



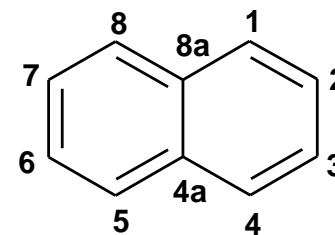
fenyl

Kondenzované aromatické uhlovodíky:



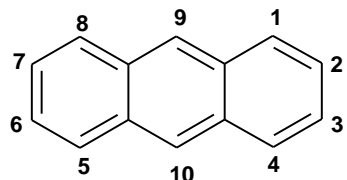
dříve: 2-naftyl

nyní: naftalen-2-yl

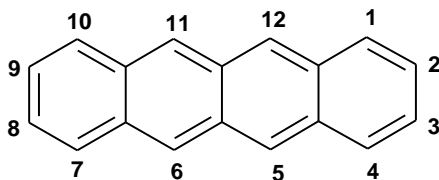


naftalen

lineárně anelované:

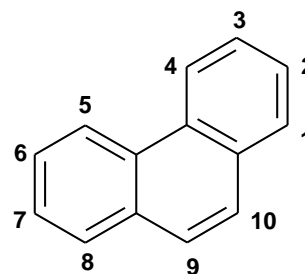


anthracen

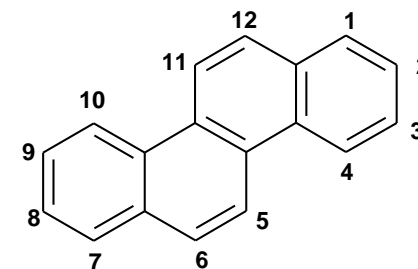


tetracen (naftacen)

angulárně anelované:



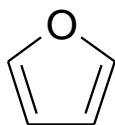
fenanthren



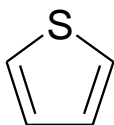
chrysen

Ad 4) heterocyklické sloučeniny (triviální názvosloví)

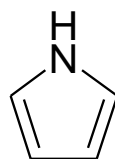
Pětičlenné



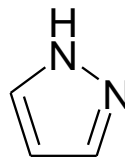
furan



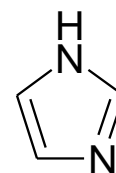
thiofen



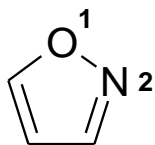
pyrrol



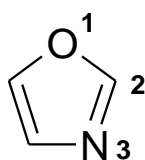
pyrazol



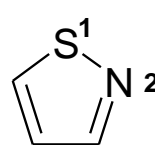
imidazol



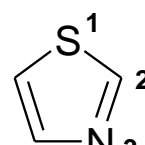
isoxazol



oxazol

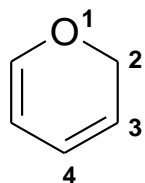


isothiazol

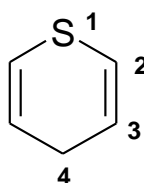


thiazol

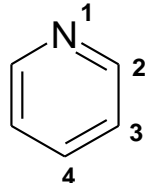
Šestičlenné



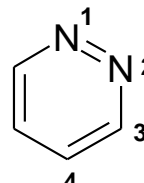
2H-pyran



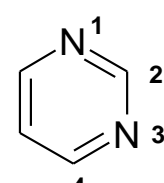
4H-thiopyran



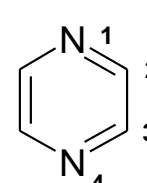
pyridin



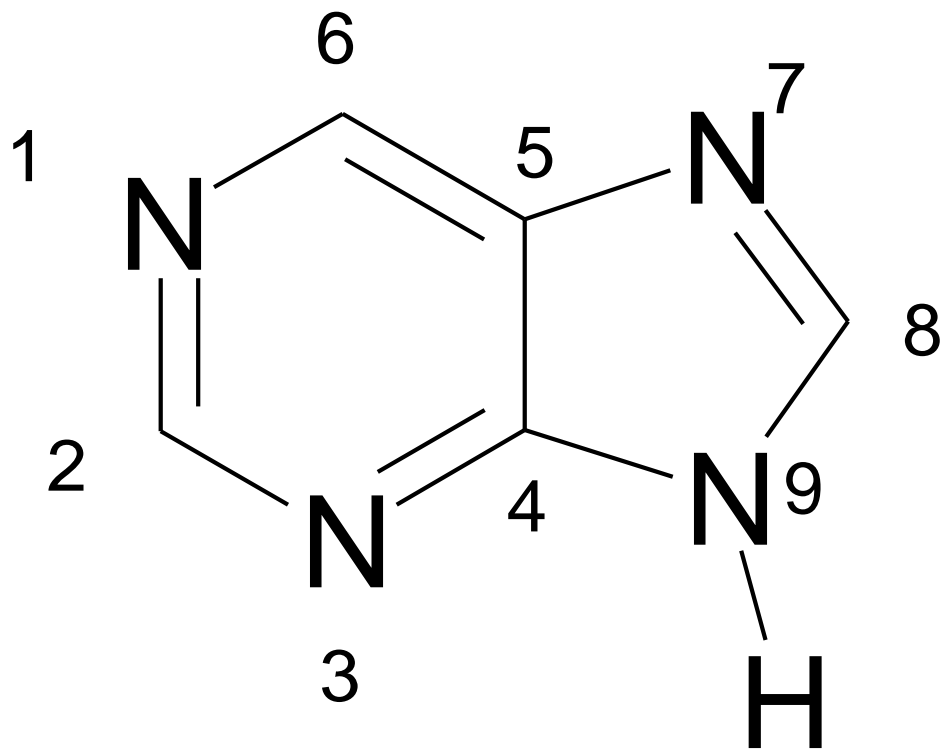
pyridazin



pyrimidin



pyrazin



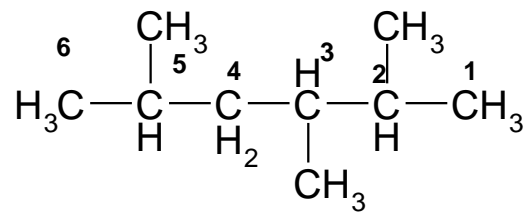
purin

Větvený alifatický skelet:

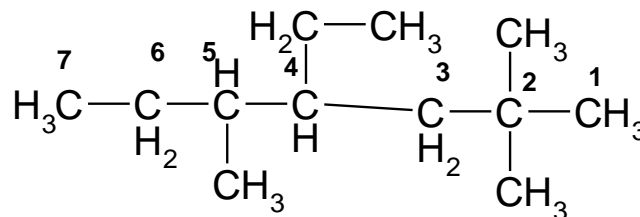
-určení hlavního tzn. nejdelšího řetězce

-substituenty s nejnižší polohou lokantu v řetězci

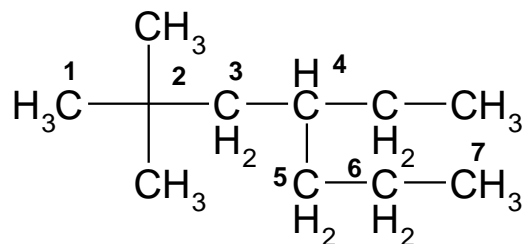
-název substituentů podle abecedy (bez ohledu na násobící předpony)



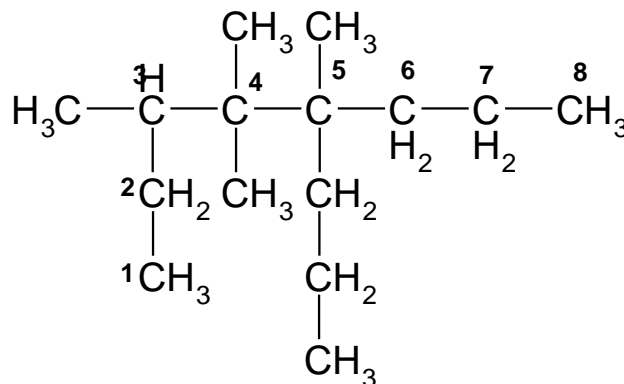
2,3,5-trimethylhexan
(ne 2,4,5-trimethylhexan)



4-ethyl-2,2,5-trimethylheptan



4-ethyl-2,2-dimethylheptan
(ne 2,2-dimethyl-4-propylhexan)



3,4,4,5-tetramethyl-5-propyloktan

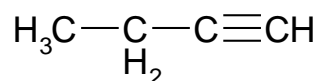
Skelet s násobnou vazbou: dvojná vazba –**en**; trojná vazba –**yn** (dříve –in)

Volíme základní nerozvětvený řetězec s největším počtem uhlíku.

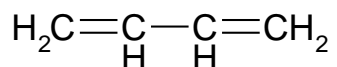
Polohu násobných vazeb vyjadřujeme pokud možno nejmenšími lokanty, bez ohledu na to, že v některých případech je poloha trojné vazby vyjádřena menším lokantem než poloha dvojně vazby.

V případě možností více alternativ polohu dvojně vazby označíme menším lokantem.

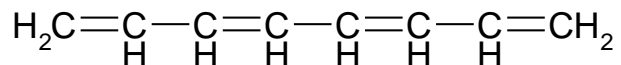
Je-li možnost volby mezi řetězci se stejným počtem uhlíkových atomů a násobných vazeb, pak upřednostňujeme řetězec s největším počtem dvojných vazeb.



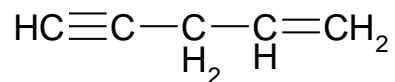
but-1-yn



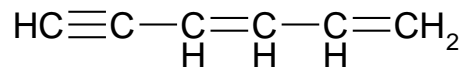
buta-1,3-dien



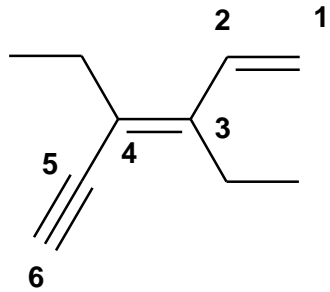
okta-1,3,5,7-tetraen



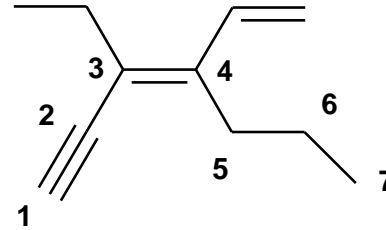
pent-1-en-4-yn



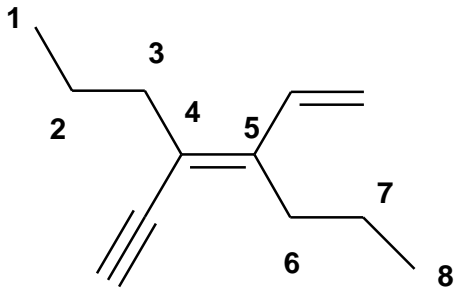
hexa-1,3-dien-5-yn



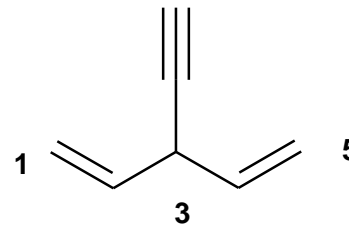
3,4-diethylhexa-1,3-dien-5-yn



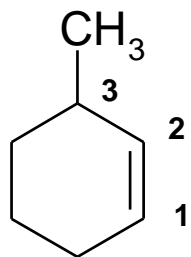
3-ethyl-4-vinylhept-3-en-1-yn



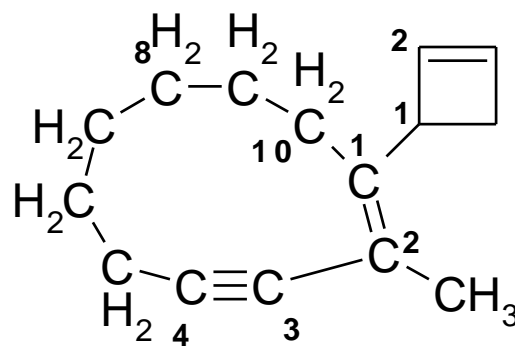
4-ethynyl-5-vinyllokt-4-en



3-ethynylpenta-1,4-dien

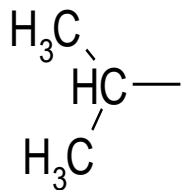


3-methylcyklohex-1-en
nebo 3-methylcyklohexen



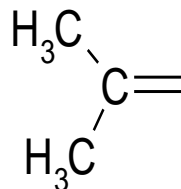
1-(cyklobut-2-en-1-yl)-2-methylcyklodec-1-en-3-yn

Alifatické substituenty používané při tvorbě větvených skeletů



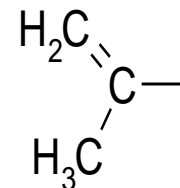
isopropyl

(propan-2-yl)



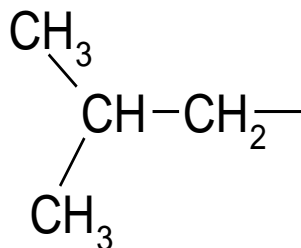
isopropyliden

(propan-2-yliden)



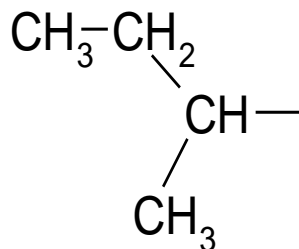
isopropenyl

(prop-1-en-2-yl)



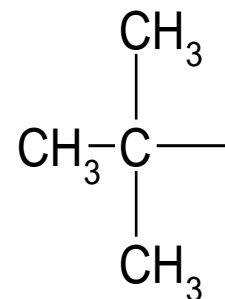
isobutyl

(2-methylpropyl)



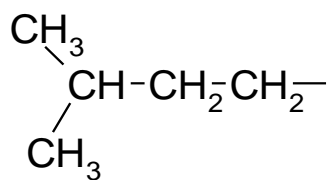
sec-butyl

(butan-2-yl)



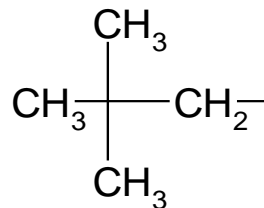
terc-butyl

(2-methylpropan-2-yl)



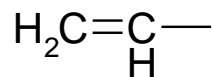
isopentyl

(3-methylbutyl)



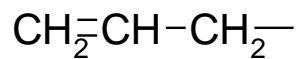
neopentyl

(2,2-dimethylpropyl)



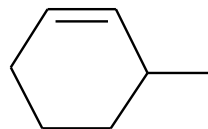
vinyl

(ethenyl)



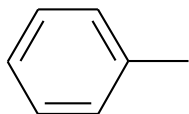
allyl

(prop-2-en-1-yl)

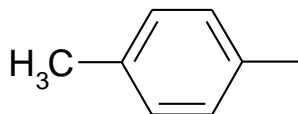


cyklohex-2-en-1-yl

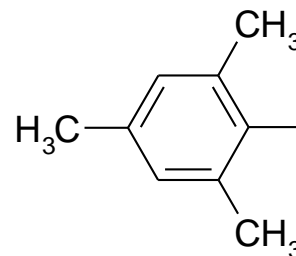
Substituenty používané při tvorbě větvených skeletů obsahující aromatické jádro



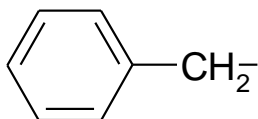
fenyl



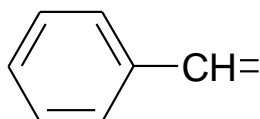
4-tolyl
a ostatní isomery



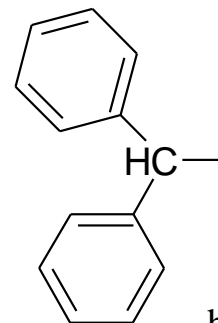
mesityl



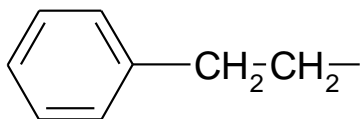
benzyl



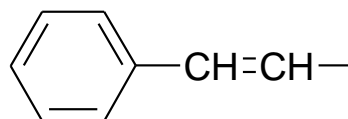
benzyliden
(fenylmethyliden)



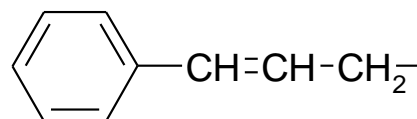
benzhydryl
(difenylmethyl)



fenethyl
(2-fenylethyl)

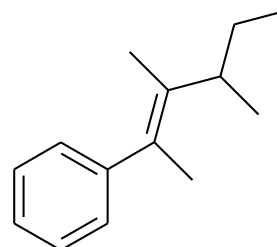
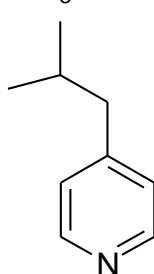
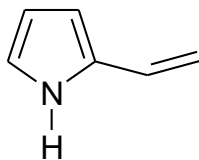
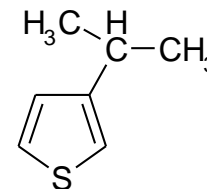
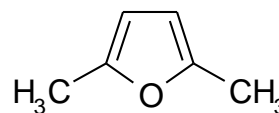
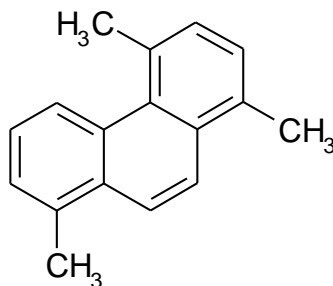
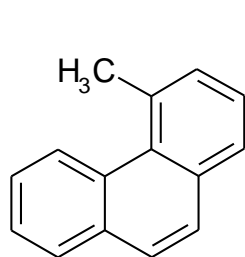
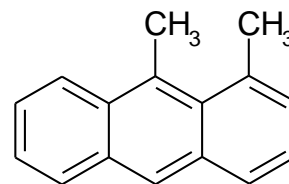
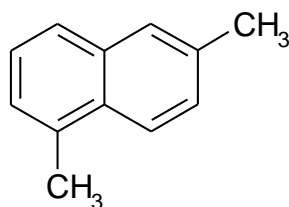
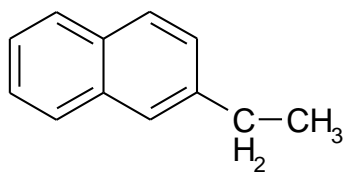
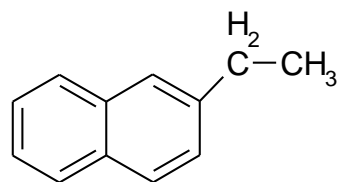
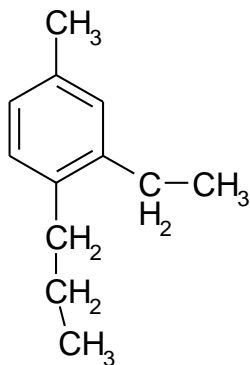
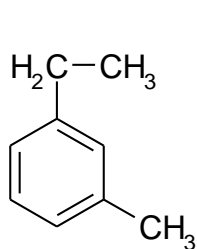


styryl
(2-fenylethenyl)

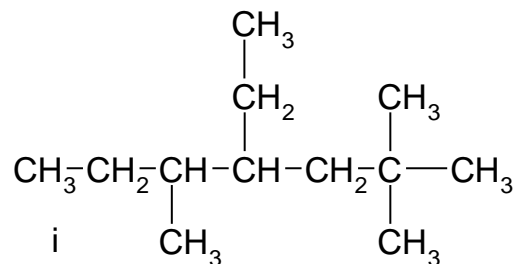
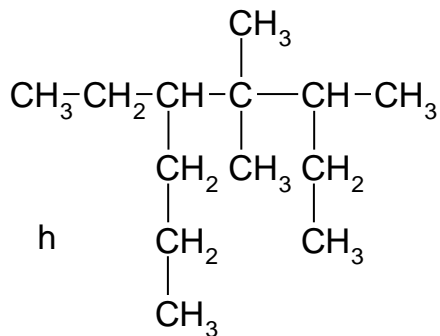
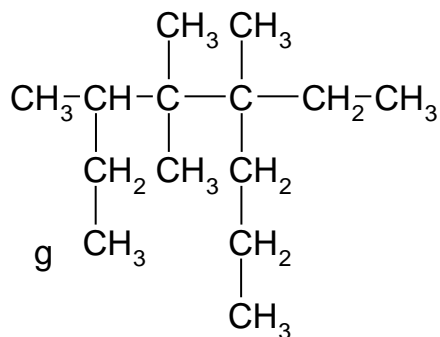
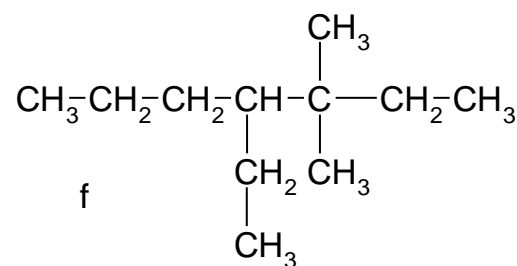
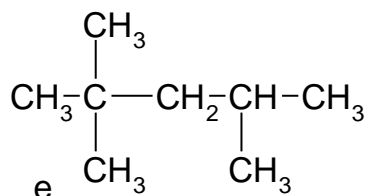
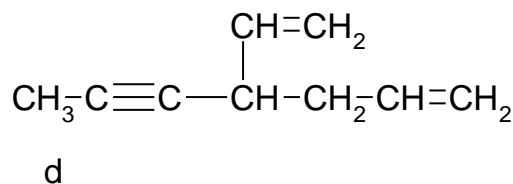
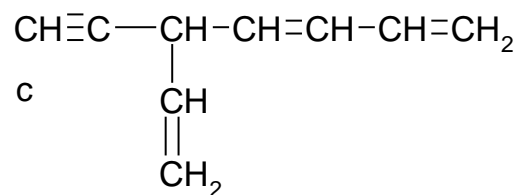
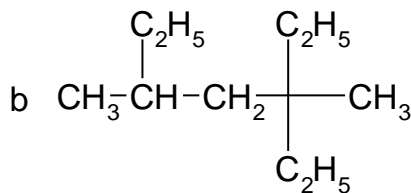
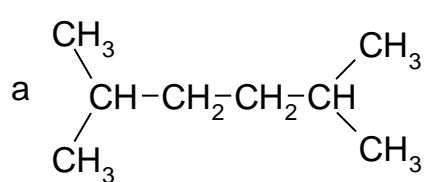


cinnamyl
(3-fenylprop-2-en-1-yl)

Utvořte správné názvy těchto sloučenin:



Utvořte správné názvy sloučenin:



Řešení: a) 2,5-dimethylhexan

b) 3-ethyl-3,5-dimethylheptan

c) 5-ethynylhepta-1,3,6-trien

d) 4-vinylhept-1-en-5-yn

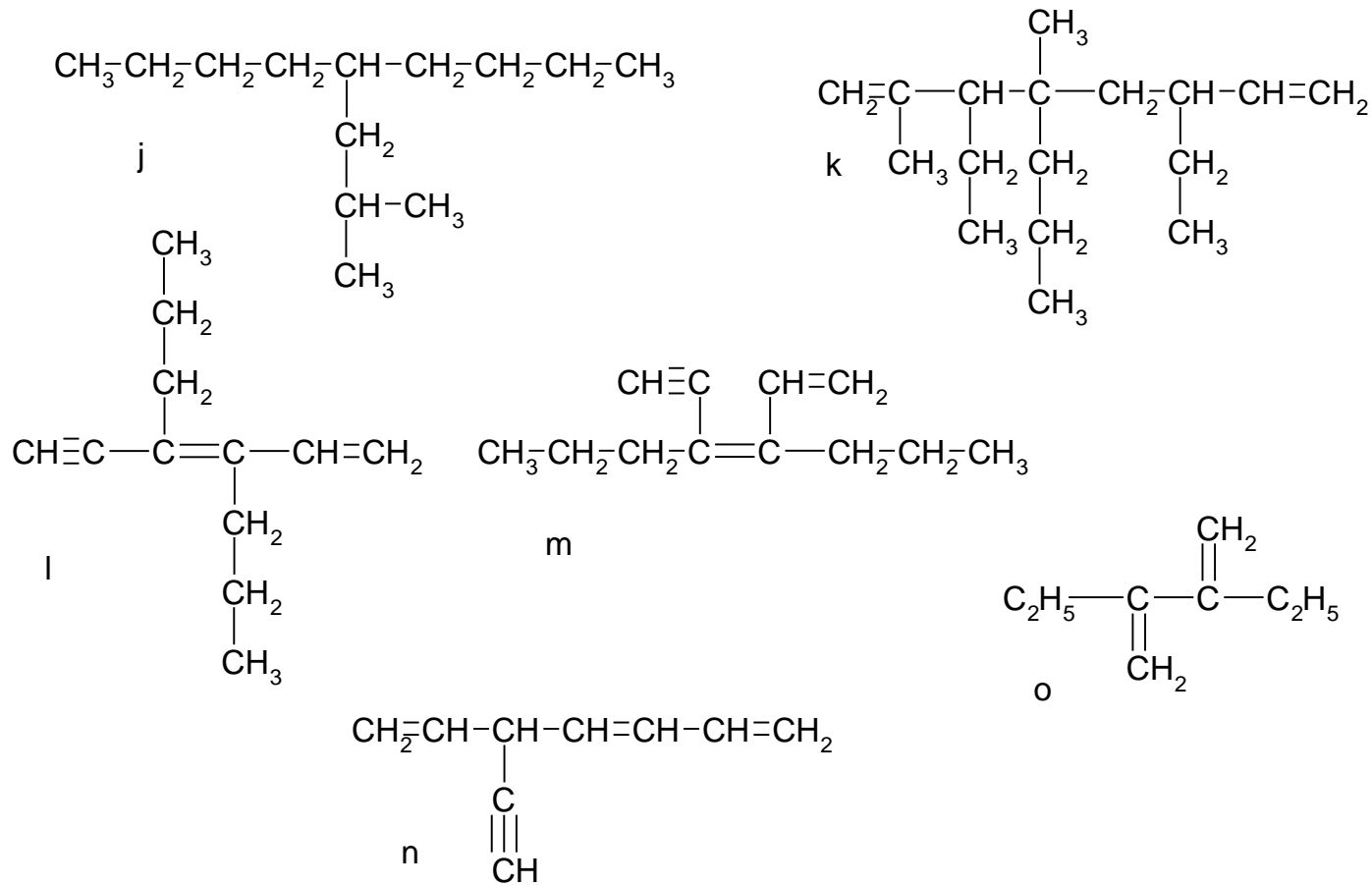
e) 2,2,4-trimethylpentan

f) 4-ethyl-3,3-dimethylheptan

g) 5-ethyl-3,4,4,5-tetramethyloktan

h) 5-ethyl-3,4,4-trimethyloktan

i) 4-ethyl-2,2,5-trimethylheptan



Řešení: j) 5-isobutylnonan (5-(2-methylpropyl)nonan)

k) 3,6-diethyl-2,4-dimethyl-4-propylokta-1,7-dien

l) 4-ethynyl-5-vinylokt-4-en

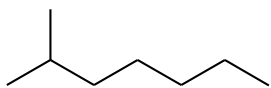
m) 4-ethynyl-5-vinylokt-4-en

n) 5-ethynylhepta-1,3,6-trien

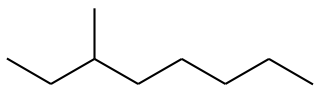
o) 3,4-dimethylidenhexan

Seminární úkoly

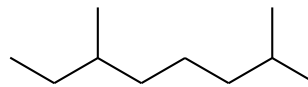
1. Pojmenujte tyto nasycené uhlovodíky :



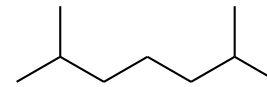
1



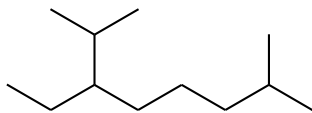
2



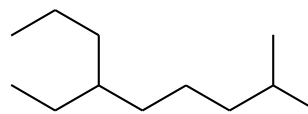
3



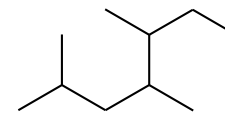
4



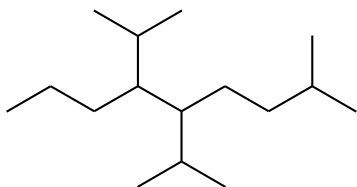
5



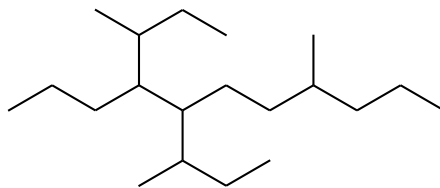
6



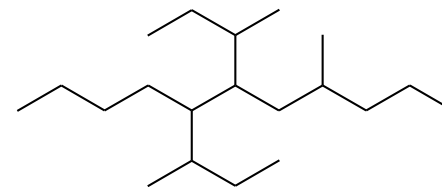
7



8

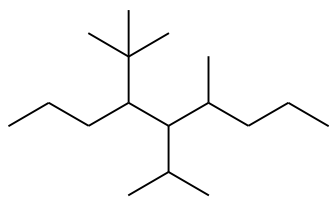


9

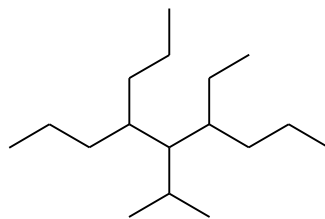


10

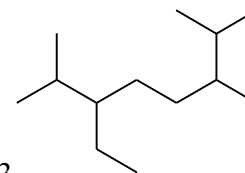
2. Pojmenujte tyto nasycené uhlovodíky :



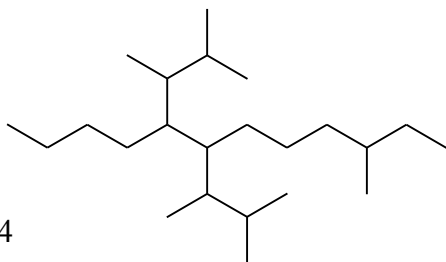
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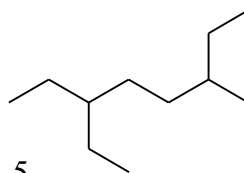
2



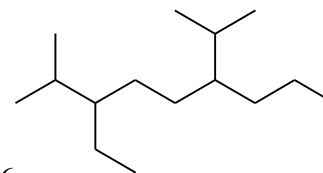
3



4



5

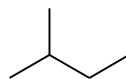


6

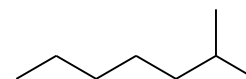
3-methyl-7,8-bis(3-methylbutan-2-yl)dodekan



7



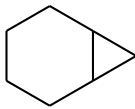
8



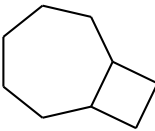
9

isooktan
2-methylheptan

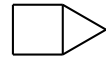
3. Pojmenujte tyto bicyklické uhlovodíky :



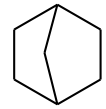
1



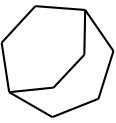
2



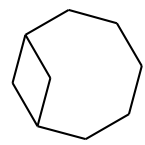
3



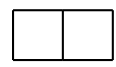
4



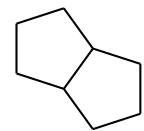
5



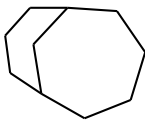
6



7

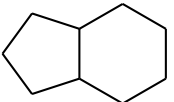


8

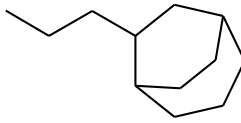


9

bicyklo[4.3.1]dekan



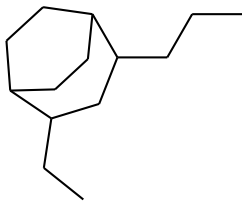
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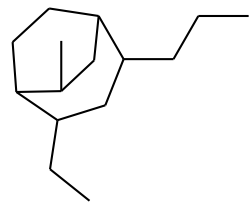
11

12

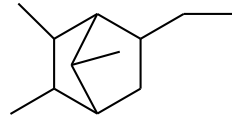
2-propylbicyklo[3.2.2]nonan



13

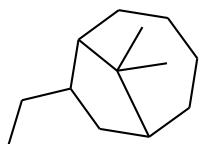


14



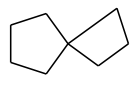
15

5-ethyl-2,3,7-trimethylbicyklo[2.2.1]heptan



16

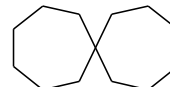
4. Pojmenujte tyto spirocyklické uhlovodíky:



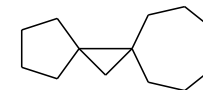
1



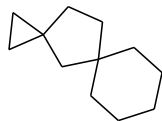
2



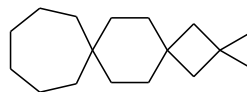
3



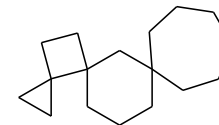
4



5

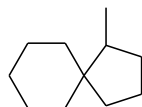


6

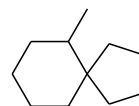


7

trispiro[2.0.3.6.1.2]heptadekan

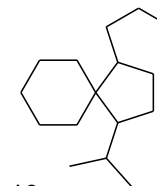


8

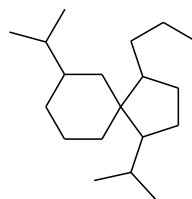


9

6-methylspiro[4.5]dekan

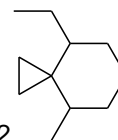


10

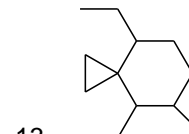


11

1,7-diisopropyl-4-propylspiro[4.5]dekan

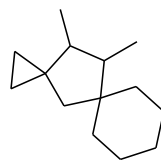


12

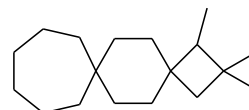


13

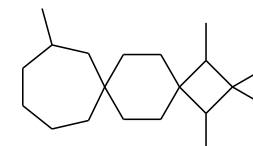
8-ethyl-4,5-dimethylspiro[2.5]oktan



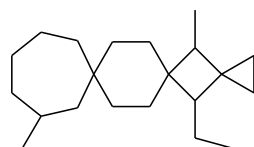
14



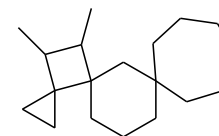
15



16



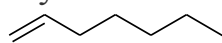
17



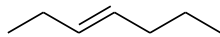
18

16,17-dimethyltrispiro[2.0.3.6.1.2]heptadekan

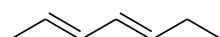
5. Pojmenujte tyto nenasycené uhlovodíky:



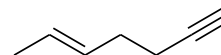
1



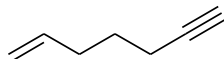
2



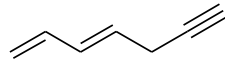
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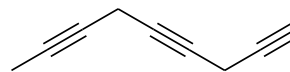
4



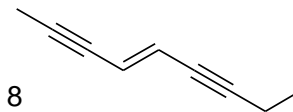
5



6

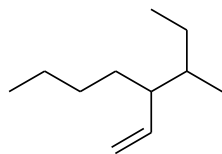


7



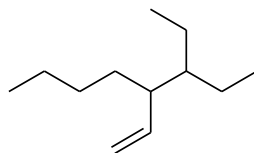
8

nona-4-en-2,6-diyne

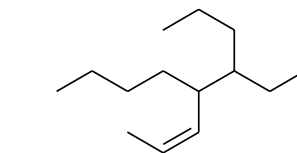


9

3-methyl-4-vinyl-octan

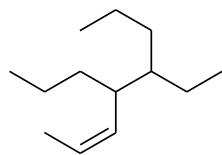


10

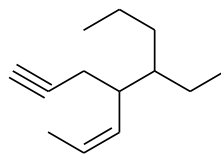


11

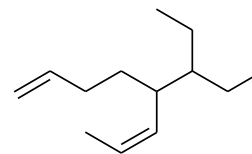
4-ethyl-5-(prop-1-en-1-yl)nonan



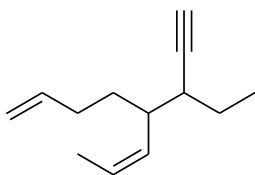
12



13

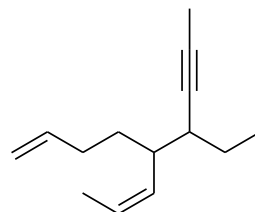


14

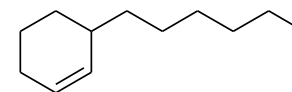


15

5-(pent-1-yn-3-yl)okta-1,6-dien

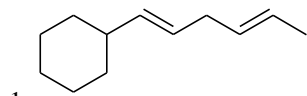


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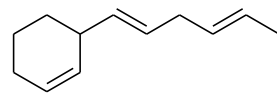


17

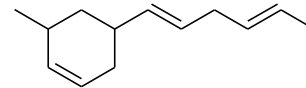
6. Pojmenujte tyto
nenасыcené uhlovodíky:



(hexa-1,4-dien-1-yl)cyklohexan

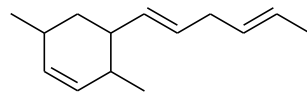


2

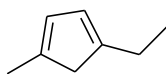


3

5-(hexa-1,4-dien-1-yl)-3-methylcyklohex-1-en

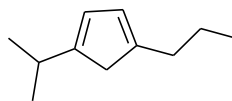


4

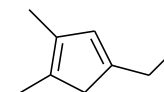


5

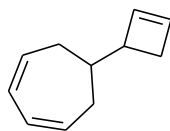
1-ethyl-4-methylcyklopenta-1,3-dien



6

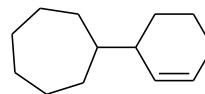


7

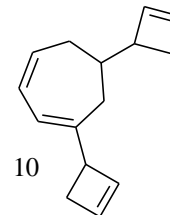


8

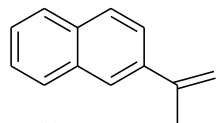
6-(cyklobut-2-en-1-yl)cyklohepta-1,3-dien



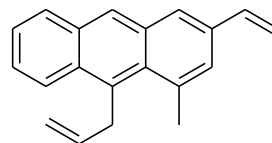
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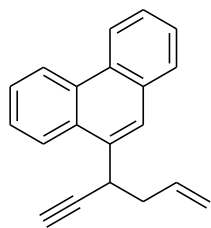
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11



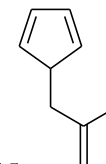
12



13



14



15

5-(2-methylallyl)cyclopenta-1,3-dien

5-(prop-1-en-2-yl)cyklopenta-1,3-dien
5-isopropenylcyklopenta-1,3-dien