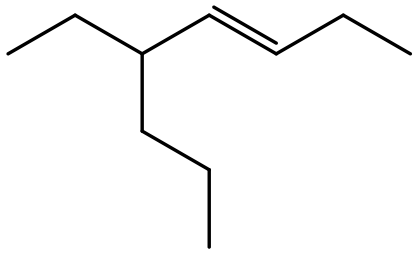
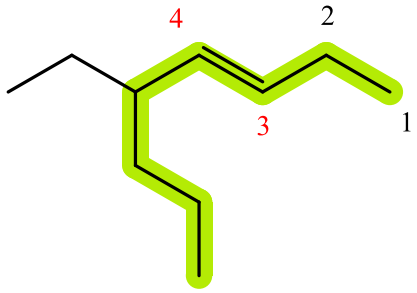
Nomenclatura alcheni, dieni e cicloalcheni

1. Individuare come catena principale quella più lunga che contiene il doppio legame, numerandola in modo che al doppio legame risulti assegnato il più basso valore possibile

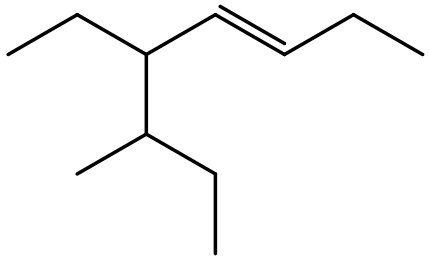
Sostituenti – prefisso che indica il numero di atomi di carbonio – posizione doppio legame – suffisso *ene*

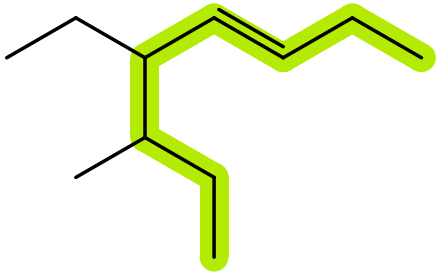




(*E*)-5-etilott-3-ene

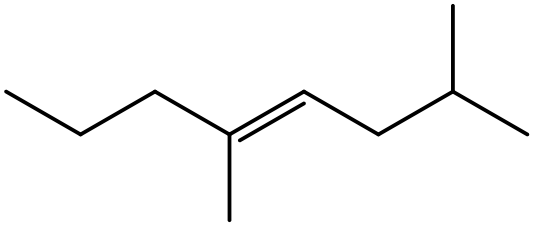
2. Gli eventuali sostituenti vanno citati in ordine alfabetico, riportando l'indice dell'atomo di carbonio su cui risultano attaccatti

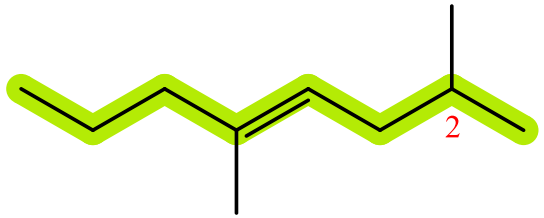




(*E*)-5-etil-6-metilott-3-ene

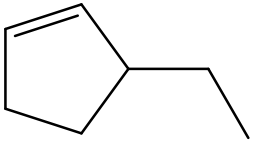
3. A parità di indice che individua la posizione del doppio legame, la numerazione della catena va effettuata in modo che agli eventuali sostituenti sia assegnata la più bassa numerazione possibile

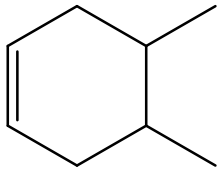


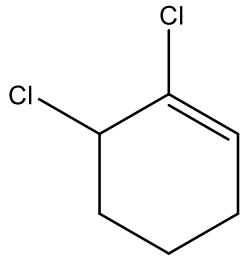


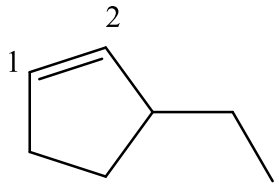
(*E*)-2,5-dimetilott-4-ene

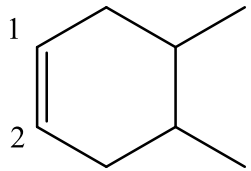
4. Negli alcheni ciclici non è necessario indicare la posizione del doppio legame, a meno che nella molecola non siano presenti raggruppamenti di maggiore priorità (p.es. C=O, COOH, ecc.)

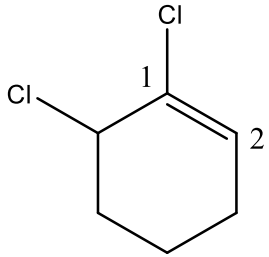












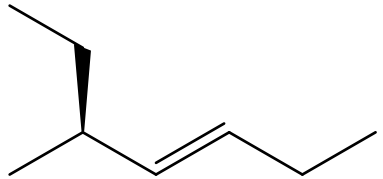
3-etilciclopentene

4,5-dimetilcicloesene

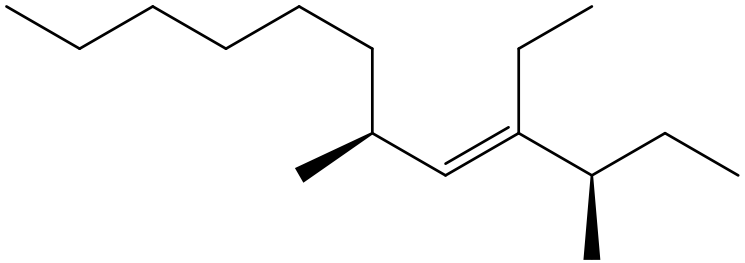
1,6-diclorocicloesene

1. Attribuire il nome IUPAC ai seguenti **alcheni**:

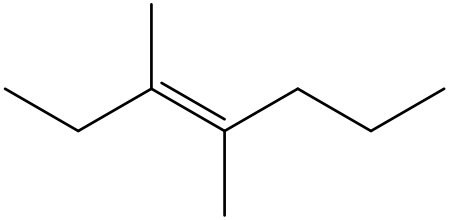
a.



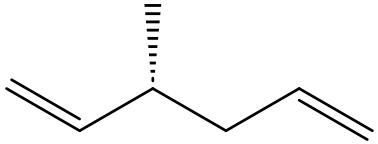
b.



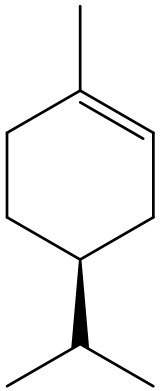
c.



d.

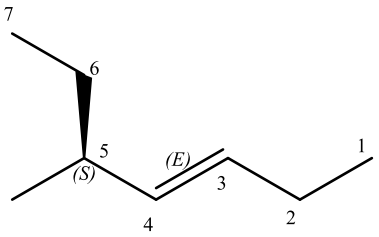


e.



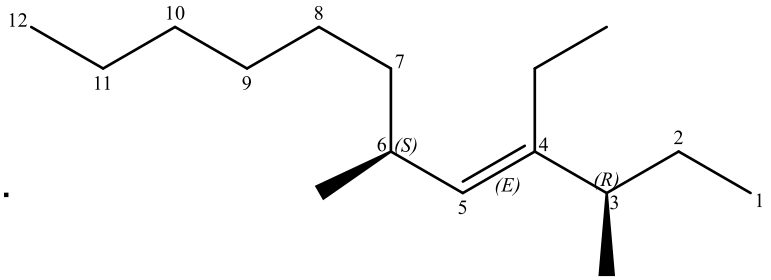
1. Attribuire il nome IUPAC ai seguenti **alcheni** (soluzioni):

a.



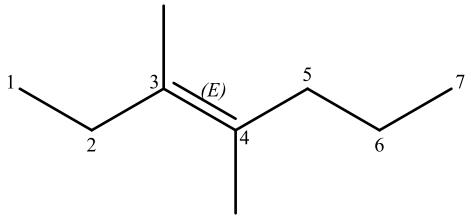
(5*S*, *E*)-5-metilept-3-ene

b.



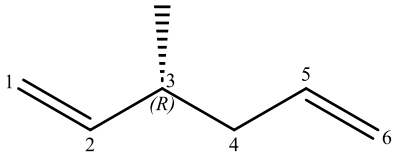
(3*R*,6*S*,*E*)-4-etil-3,6-dimetildodec-4-ene

c.



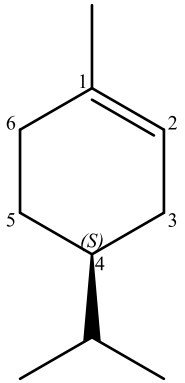
(*E*)-3,4-dimetilept-3-ene

d.



(*R*)-3-metilesa-1,5-diene

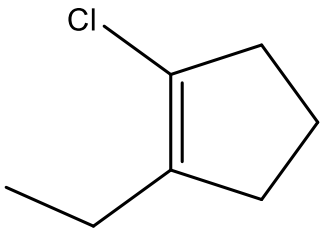
e.



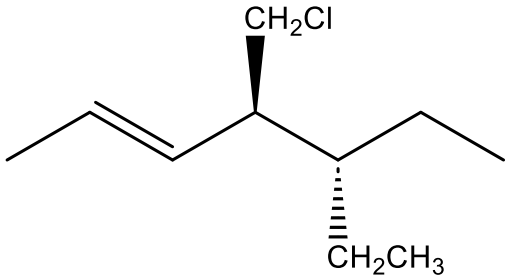
(*S*)-4-isopropil-1-metilcicloes-1-ene

2. Attribuire il nome IUPAC ai seguenti **alcheni sostituiti**:

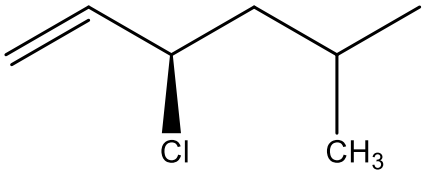
a.



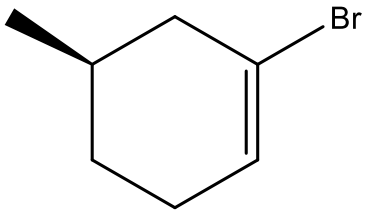
b.



c.

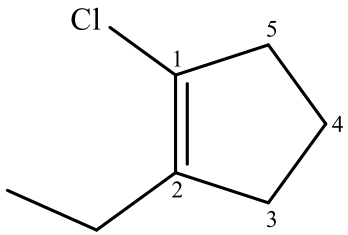


d.



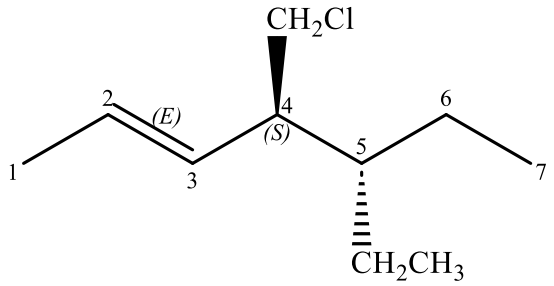
2. Attribuire il nome IUPAC ai seguenti **alcheni sostituiti** (soluzioni):

a.



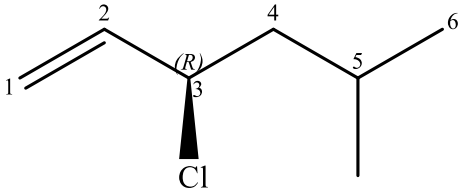
1-cloro-2-etilciclopentene

b.



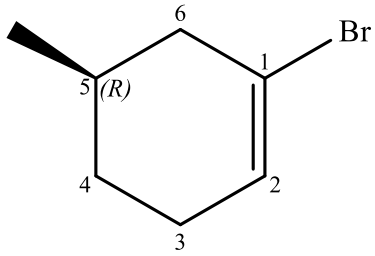
(*S*,*E*)-4-(clorometil)-5-etilept-2-ene

c.



(*R*)-3-cloro-5-metiles-1-ene

d.



(*R*)-1-bromo-5-metilcicloesene

Nomenclatura polieni

La nomenclatura IUPAC dei polieni segue le stesse regole di quella degli alcheni con piccole differenze:

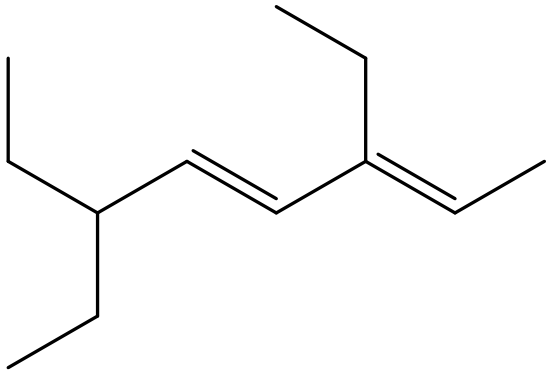
- **quando si individua la catena principale della molecola, questa deve includere il massimo numero di atomi di carbonio coinvolti in un doppio legame.**

- **il nome che viene dato alla catena principale è simile a quanto previsto per gli alcani, ma il suffisso -*ano* viene sostituito da un suffisso composto da una "-a-", la posizione dei doppi legami, il numero di doppi legami presenti nella catena e dal suffisso -*ene* (buta-1,3-diene, esa-1,3,5-triene)**

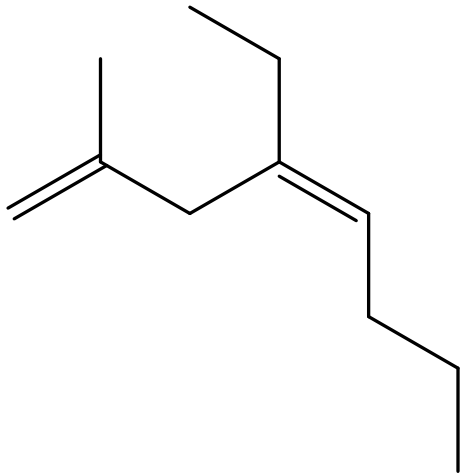
- **nel numerare la catena principale, il numero più basso possibile dovrà essere assegnato a due atomi di carbonio coinvolti in uno dei doppi legami presenti nella molecola.**

3. Attribuire il nome IUPAC ai seguenti **polieni**:

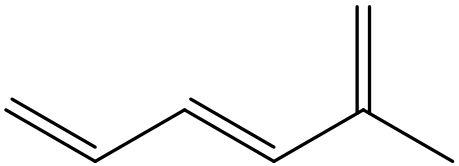
a.



b.

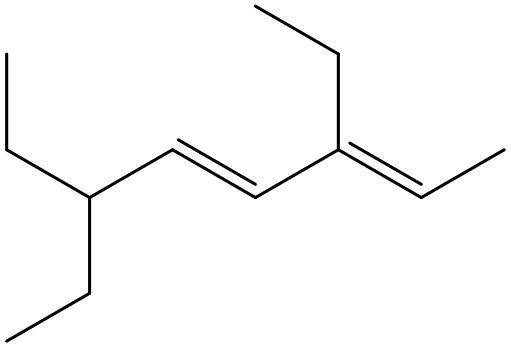


c.



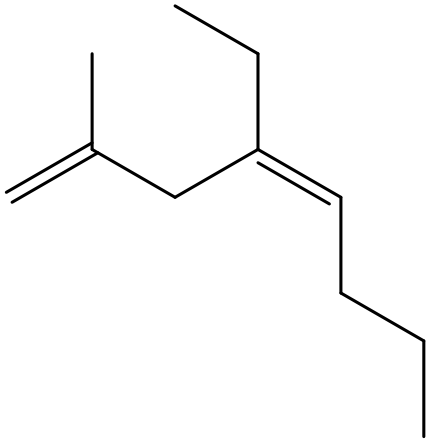
3. Attribuire il nome IUPAC ai seguenti **polieni** (soluzioni):

a.



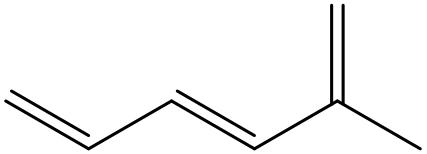
(2*E*,4*E*)-3,6-dietilotta-2,4-diene

b.



(*Z*)-4-etil-2-metilotta-1,4-diene

c.



(*E*)-2-metilesa-1,3,5-triene

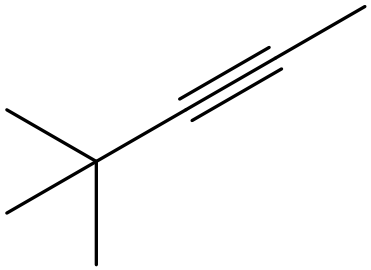
Nomenclatura alchini

La nomenclatura sistematica IUPAC è del tutto simile a quella già descritta per gli alcheni.
In tale nomenclatura ciò che diversifica gli alchini dagli alcheni è il diverso suffisso da utilizzare:
–ene viene modificato in –ino (-in quando sono presenti altri gruppi funzionali a più alta priorità).

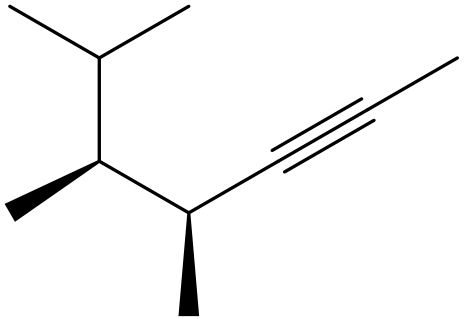
Nei nomi di alchini contenenti più tripli legami andranno utilizzati gli infissi –adiin(2) –atriin(3) –atetrain(4) e così via

4. Attribuire il nome IUPAC ai seguenti **alchini**:

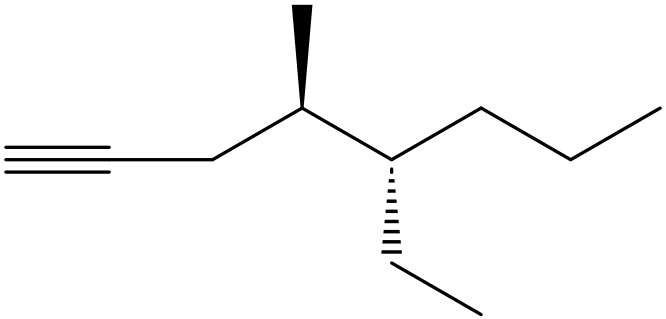
a.



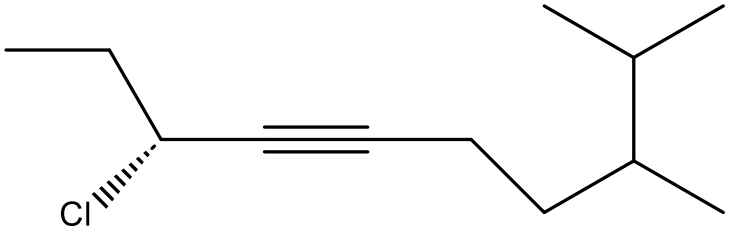
b.



c.

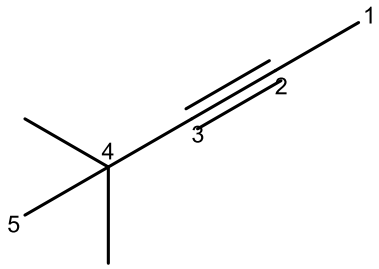


d.



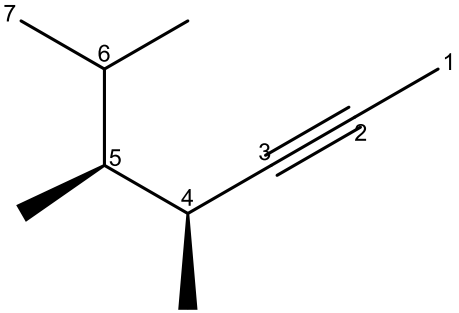
4. Attribuire il nome IUPAC ai seguenti **alchini** (soluzioni):

a.



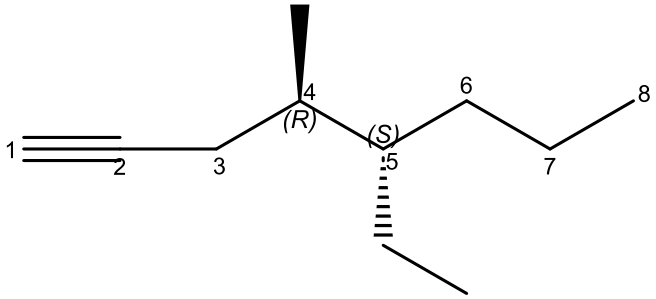
4,4-dimetilpent-2-ino

b.



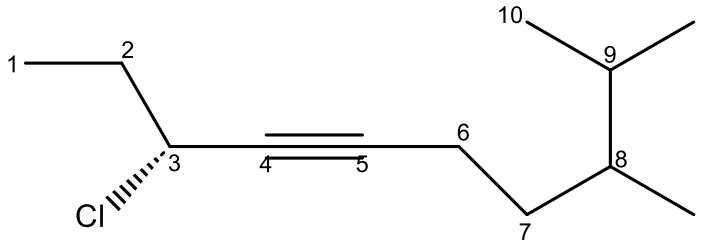
(4*S*, 5*S*)-4,5,6-trimetilept-2-ino

c.



(4*R*,5*S*)-5-etil-4-metil-ottino

d.



(3*R*)-3-cloro-8,9-dimetildec-4-ino

Nomenclatura legami multipli

1. Selezionare come catena principale quella contenente il maggior numero di legami multipli (doppi legami ma, eventualmente, anche tripli legami), ovvero quella che contiene entrambe (o piu!) insaturazioni

2. Si nomina sia –ene che –ino (in ordine alfabetico!)

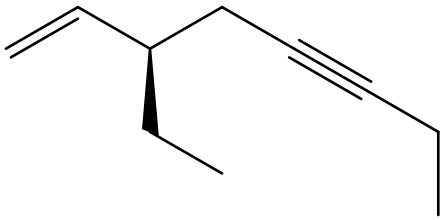
3. Attribuire al legame multiplo più vicino all'estremità di catena la più bassa numerazione; a parità di posizione un doppio legame ha però priorità su un triplo legame

4. Se ho entrambi i legami multipli terminali (quindi con numerazione 1) l'alchene ha priorità sull'alchino (anche se il triplo legame ha più vicino un sostituente) *esempio

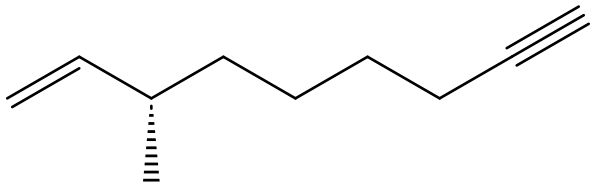
5. Se i legami multipli sono interni, si numera in modo tale da assegnare la numerazione più bassa al legame multiplo che si incontra per primo

5. Attribuire il nome IUPAC ai seguenti molecole:

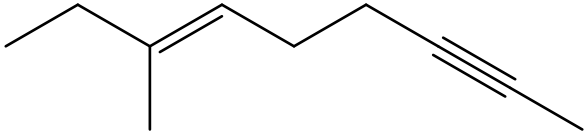
a.



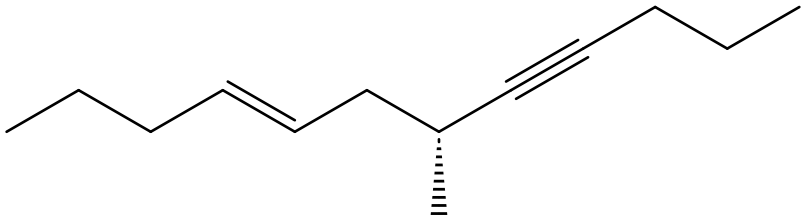
b.



c.

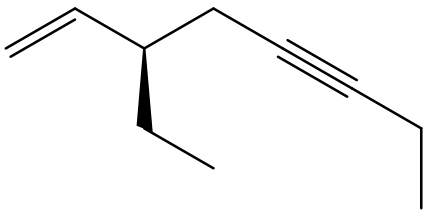


d.



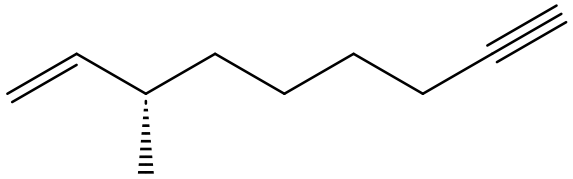
5. Attribuire il nome IUPAC ai seguenti molecole (soluzioni):

a.



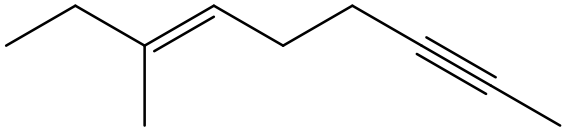
(*R*)-3-etilott-1-en-5-ino

b.



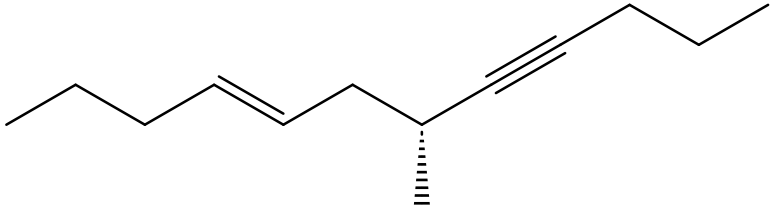
(*S*)-3-metilnon-1-en-8-ino

c.



(*E*)-7-metilnon-6-en-2-ino

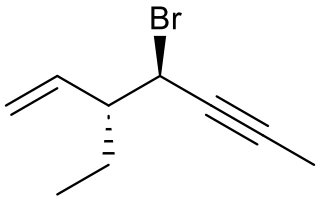
d.



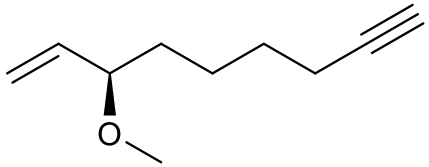
(*R*,*E*)-7-metildodec-4-en-8-ino

6. Nomenclatura misti

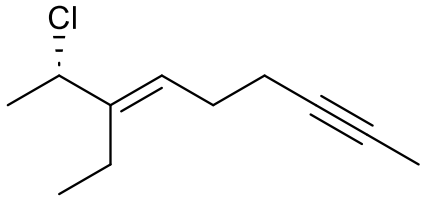
a.



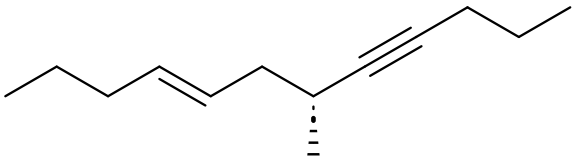
b.



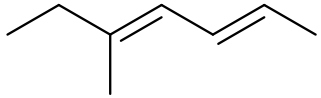
c.



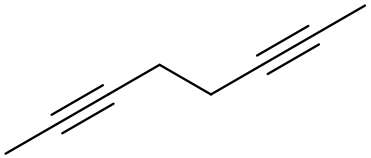
d.



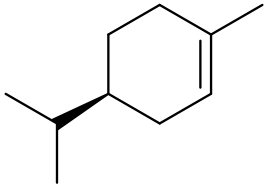
e.



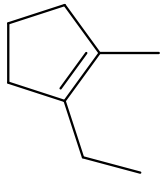
f.



g.

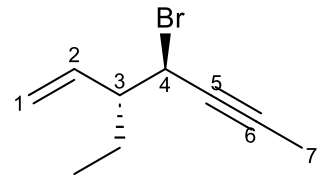


h.



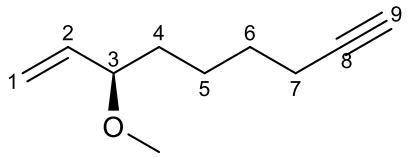
6. Nomenclatura misti (soluzioni)

a.



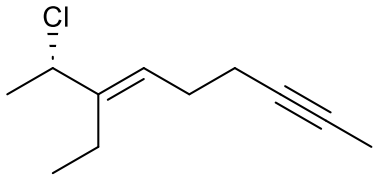
(3*R*,4*R*)-4-bromo-3-etilept-1-en-5-ino

b.



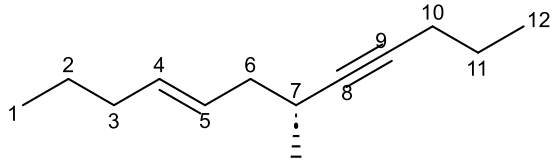
(*R*)-3-metossinon-1-en-8-ino

c.



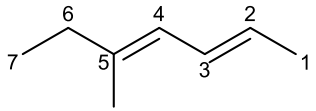
(*S*,*E*)-8-cloro-7-etilnon-6-en-2-ino

d.



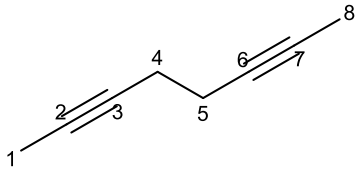
(*R*,*E*)-7-metildodec-4-en-8-ino

e.



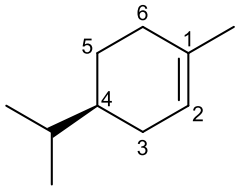
(2*E*,4*E*)-5-metilepta-2,4-diene

f.



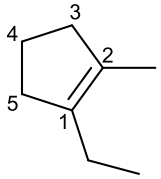
otta-2,6-diino

g.



(*S*)-4-isopropil-1-metilcicloes-1-ene

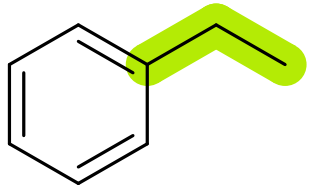
h.



1-etil-2-metilciclopent-1-ene

NOMENCLATURA BENZENE E DERIVATI – MONOSOSTITUITI

Alchilbenzeni – indicati come derivati del benzene a meno che la catena alchilica non abbia priorità.

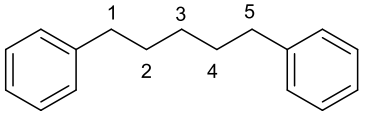


etilbenzene

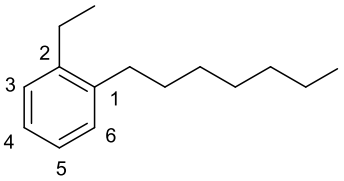
Regole di priorità alchilbenzeni:

- Idrocarburo più sostituito (caso 1)
- Idrocarburo con più atomi di carbonio (caso 2)

caso 1: la priorità va all'idrocarburo più sostituito

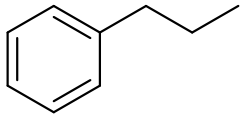


1,5-difenilpentano



1-eptil-2-etilbenzene

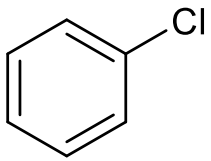
caso 2: idrocarburo con più atomi di carbonio



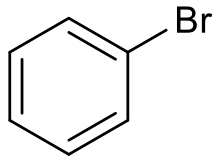
propilbenzene

NOMENCLATURA BENZENE E DERIVATI – MONOSOSTITUITI

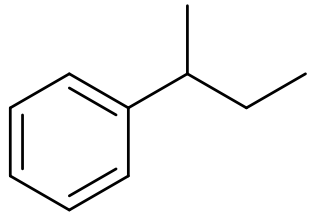
Nome sostituente + *benzene*

1. 

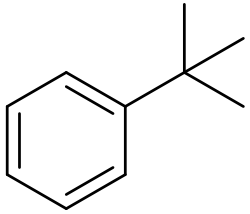
clorobenzene

2. 

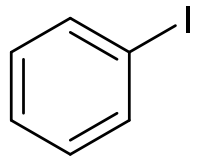
bromobenzene

3. 

sec-butilbenzene

4. 

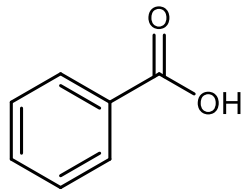
terz-butilbenzene

5. 

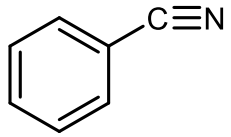
iodobenzene

NOMI COMUNI DERIVATI DEL BENZENE

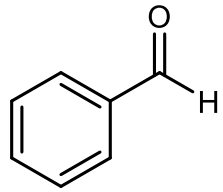
Molti benzeni sostituiti sono identificati con nomi d'uso (nome proprio).
I principali nomi d'uso accettati dalla IUPAC sono riportati nella seguente tabella:



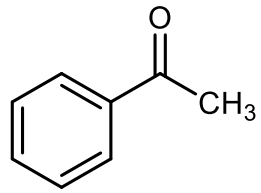
acido benzoico



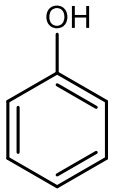
benzonitrile



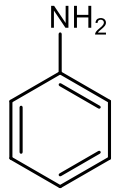
benzaldeide



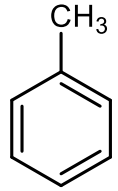
acetofenone



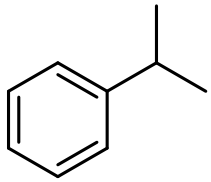
fenolo



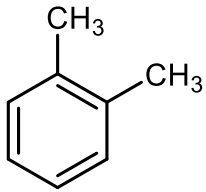
anilina



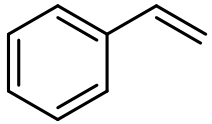
toluene



cumene

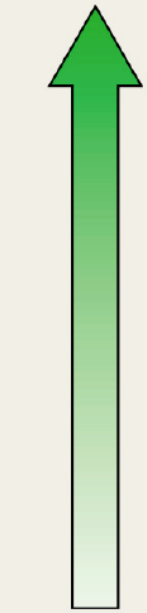


o-xilene



stirene

Priorità di gruppi funzionali nella nomenclatura IUPAC



Class Classe	Suffisso se di maggiore priorità	Prefisso se di minore priorità
Acido Carbossilico	-oico acido	carbossi
Estere	-oato	alcossicarbonil
Ammide	-ammide	ammido
Nitrile	-nitrile	ciano
Aldeide	-ale	osso (=O) formil (—CH=O)
Chetone	-one	osso (=O)
Alcol	-olo	idrossi
Ammina	-ammina	ammino
Alchene	-ene	alchenil
Alchino	-ino	alchinil
Alcano	-ano	alchil
Etere	—	alcossi
Alogenuro alchilico	—	alo

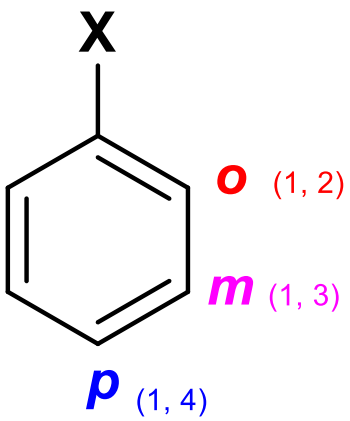
NOMENCLATURA BENZENE E DERIVATI – DISOSTITUITI

Quando possibile, i composti andranno nominati come derivati del benzene caratterizzati da nome proprio (fenolo, toluene, ecc.) con **la numerazione che parte dal sostituente "speciale"**.

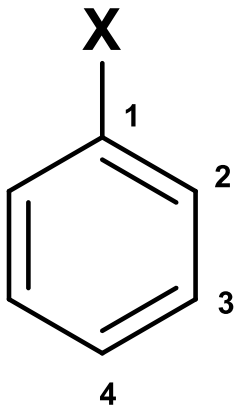
Posizione sostituente sull'anello aromatico - nome sostituente + *nome proprio del derivato del benzene*

La posizione del sostituente sull'anello aromatico si può indicare in due modi:

Isomeria orto-meta-para

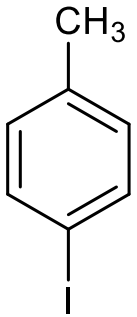


Numerazione

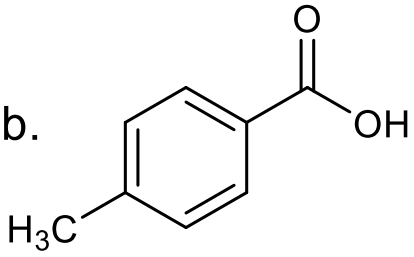


7. Attribuire il nome ai seguenti benzeni disostituiti

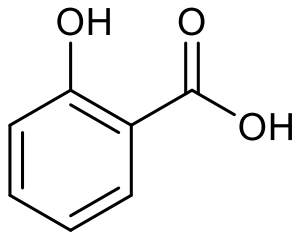
a.



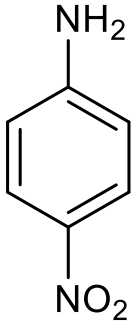
b.



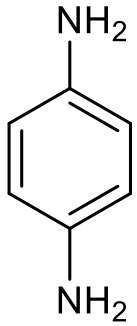
c.



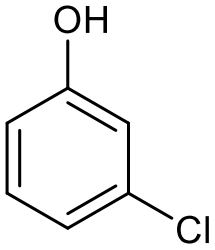
d.



e. *

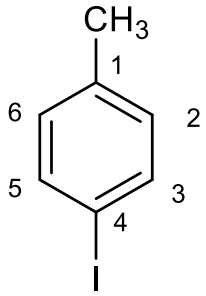


f.



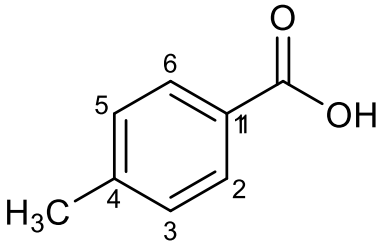
7. Attribuire il nome ai seguenti benzeni disostituiti (soluzioni)

a.



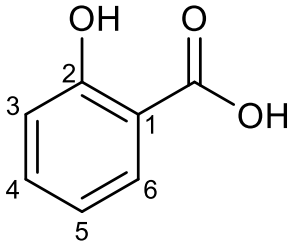
p-iodotoluene
o
4-iodotoluene

b.



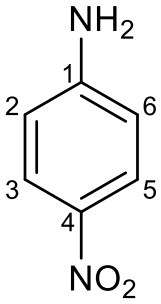
Acido p-metilbenzoico
o
Acido 4-metilbenzoico

c.



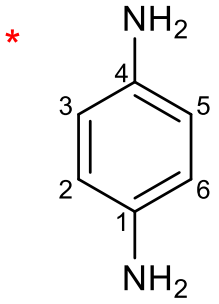
Acido o-idrossibenzoico
o
Acido 2-idrossibenzoico

d.



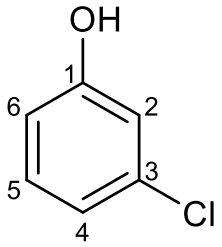
p-nitroanilina
o
4-nitroanilina

e.



1,4-diaminobenzene

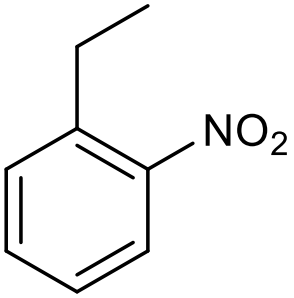
f.



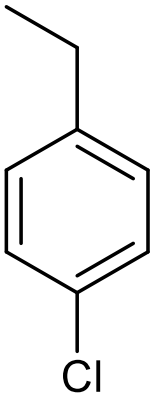
m-clorofenolo
o
3-clorofenolo

8. Attribuire il nome ai seguenti benzeni disostituiti

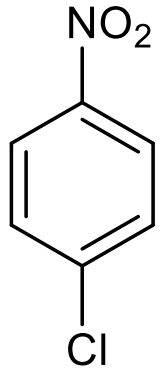
a.



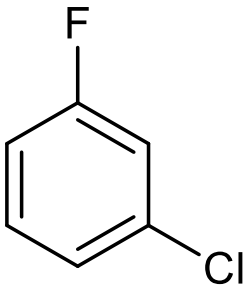
b.



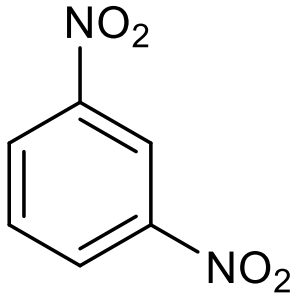
c.



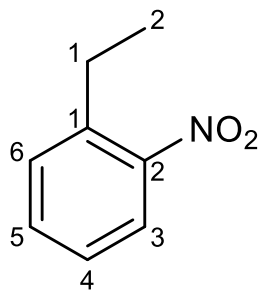
d.



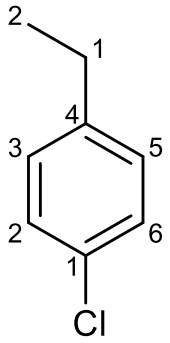
e.



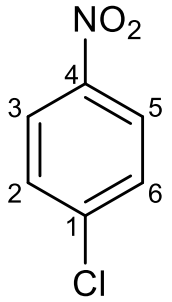
8. Attribuire il nome ai seguenti benzeni disostituiti (soluzioni)

a. 

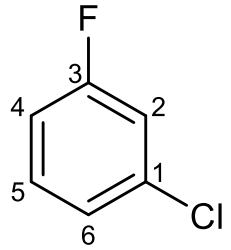
1-etil-2-nitrobenzene
o
o-etilnitrobenzene

b. 

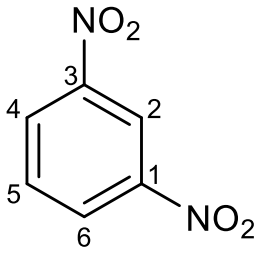
1-cloro-4-etilbenzene
o
p-cloroetilbenzene

c. 

1-cloro-4-nitrobenzene
p-cloronitrobenzene

d. 

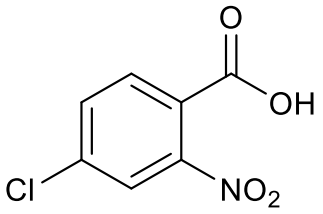
1-cloro-3-fluorobenzene
o
m-cluorofluorobenzene

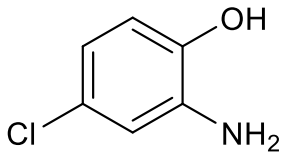
e. 

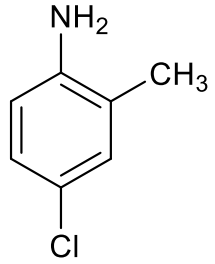
1,3-dinitrobenzene

NOMENCLATURA BENZENE E DERIVATI – POLISOSTITUITI

Sostituenti + nucleo base con nome proprio (priorità 1)

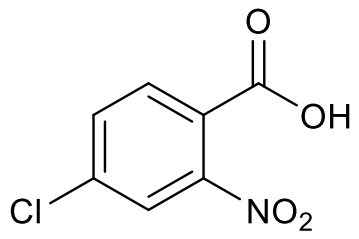
1. 

2. 

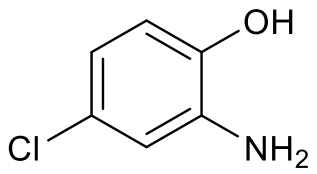
3. 

NOMENCLATURA BENZENE E DERIVATI – POLISOSTITUITI

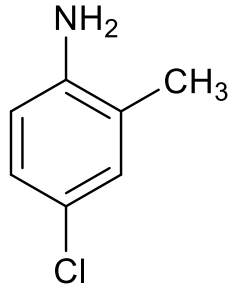
Sostituenti + nucleo base con nome proprio (priorità 1)

1. 

Acido p-cloro-o-nitrobenzoico
o
Acido 4-cloro-2-nitrobenzoico

2. 

2-ammino-4-clorofenolo
o
o-ammino-p-clorofenolo

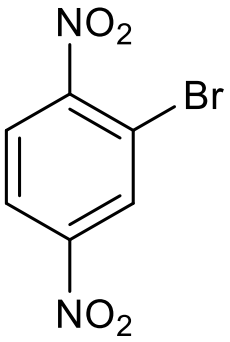
3. 

4-cloro-2-metilanilina
o
p-cloro-o-metilanilina

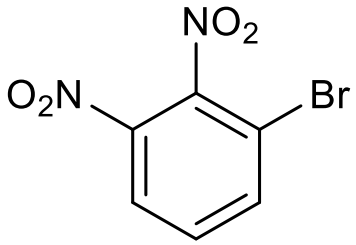
NOMENCLATURA BENZENE E DERIVATI – POLISOSTITUITI

In assenza di nucleo base di riferimento,
NUMERARE in modo tale da dare la numerazione più bassa a tutti i sostituenti.

1.

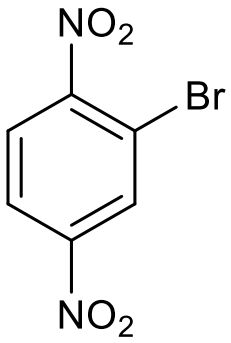


*2.

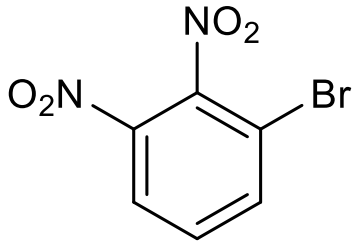


NOMENCLATURA BENZENE E DERIVATI – POLISOSTITUITI

In assenza di nucleo base di riferimento,
NUMERARE in modo tale da dare la numerazione più bassa a tutti i sostituenti.

1. 

2-bromo-1,4-dinitrobenzene

*2. 

1-bromo-2,3-dinitrobenzene