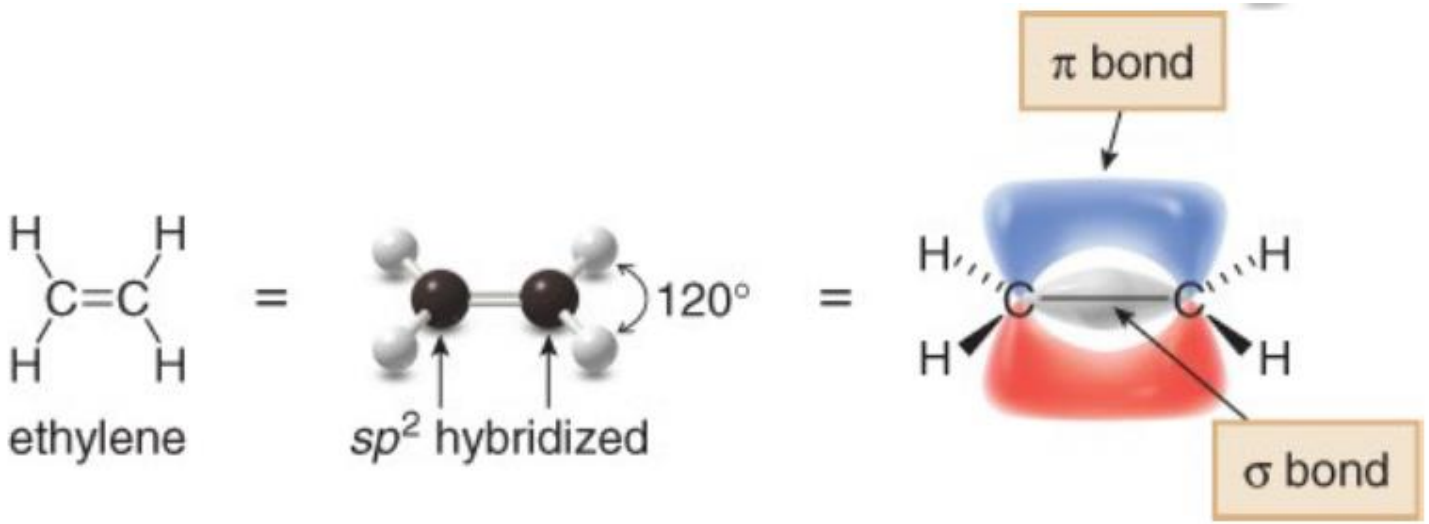
Alcheni (olefine) e alchini

Struttura e legami

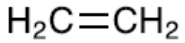


Nomenclatura IUPAC e comune

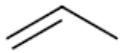
- IUPAC International Union of Pure and Applied Chemistry

	$CH_2=CH_2$	$CH_3CH=CH_2$	$CH_3C(CH_3)=CH_2$
Nome IUPAC:	Etene	Propene	2-Metilpropene
Nome d'uso:	Etilene	Propilene	Isobutilene

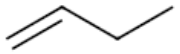
Semplici Alcheni e Alchini



Etene o etilene

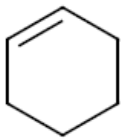


Propene

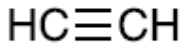


1-butene

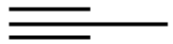
1-pentene



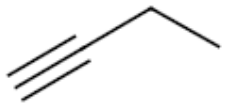
cicloesene



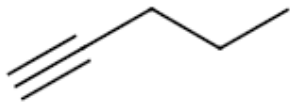
Etino o acetilene



Propino

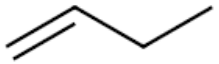


1-butino

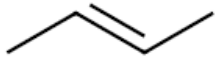


1-pentino

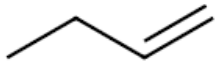
Isomeria costituzionale



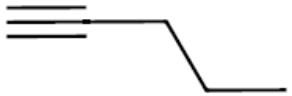
1-butene



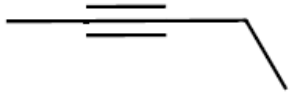
2-butene



1-butene



1-pentino



2-pentino

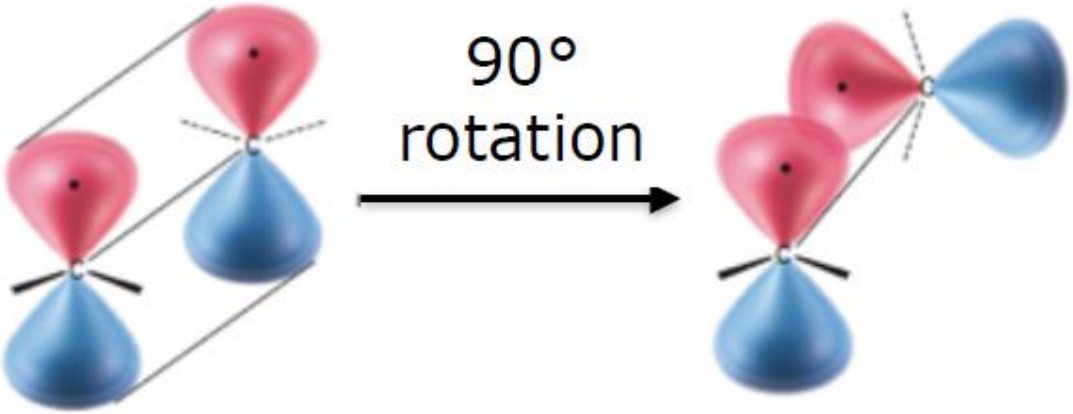
1-esene

2-esene

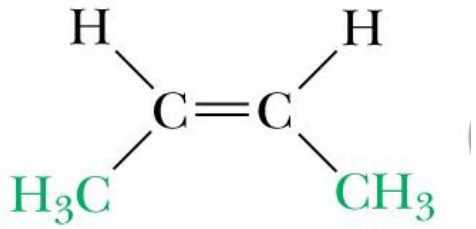
3-esene

Isomeria *cis- trans*

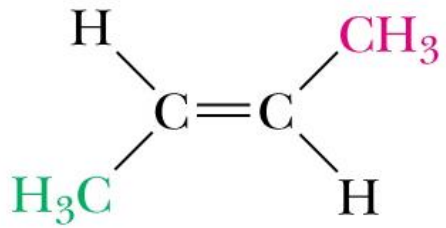
- La rotazione attorno al doppio legame è impedita



Isomeria *cis-trans*
solo per alcheni disostituiti



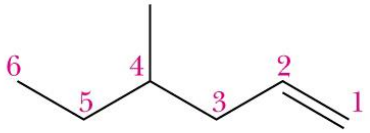
cis-2-Butene
p.f. −139 °C, p.e. 4°C

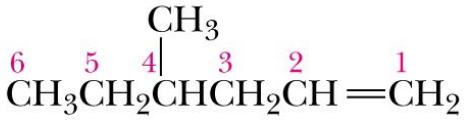


trans-2-Butene
p.f. −106 °C, p.e. 1°C

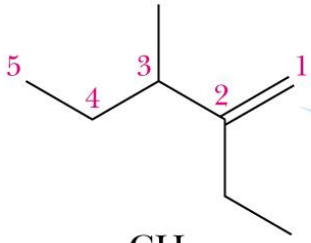
Nomenclatura
alcheni mono- e disostituiti

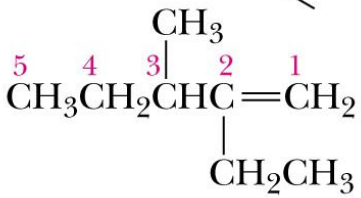
1-Esene





4-Metil-1-esene

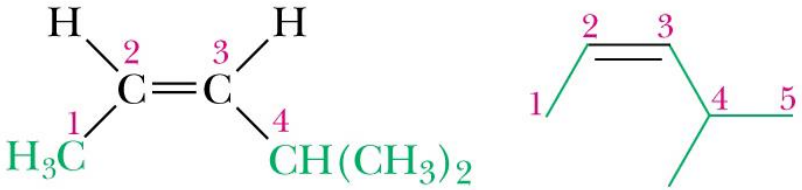




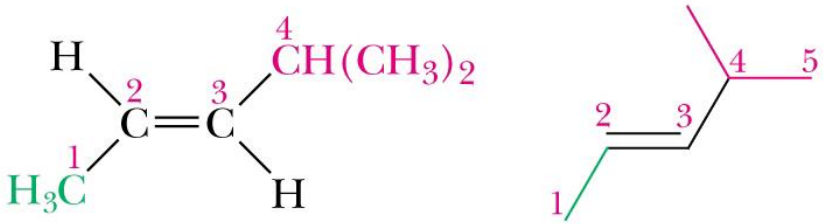
2-Etil-3-metil-1-pentene

nella nomenclatura degli alcheni, la catena principale è la catena più lunga contenente il legame C=C per intero, anche in presenza di una diversa catena più lunga non contenente il legame C=C

Nomenclatura

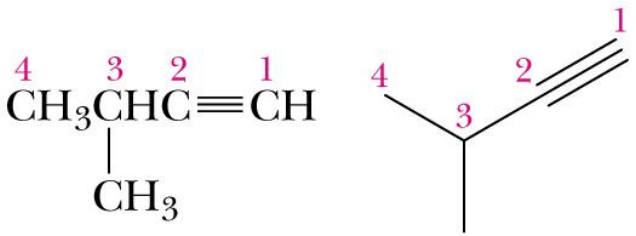


cis-4-Metil-2-pentene

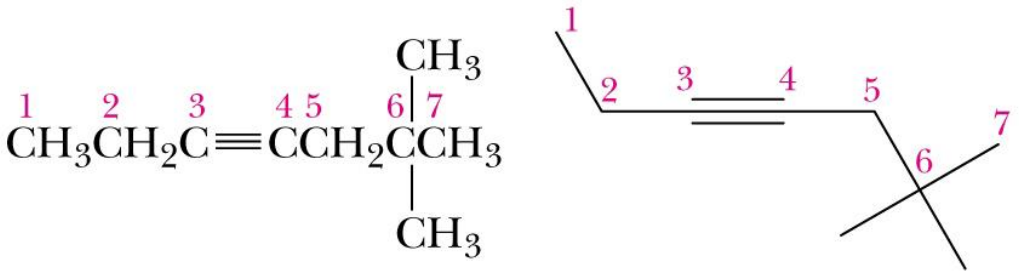


trans-4-Metil-2-pentene

Nomenclatura alchini

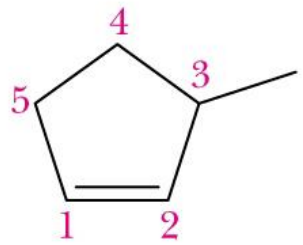


3-Metil-1-butino

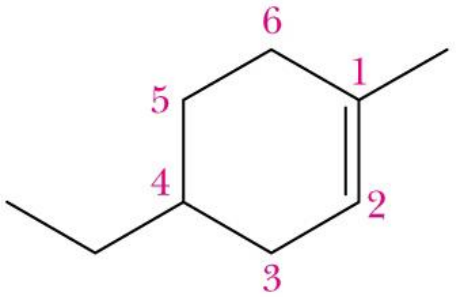


6,6-Dimetil-3-eptino

Nomenclatura cicloalcheni

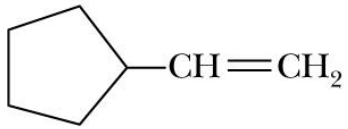
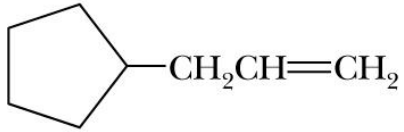
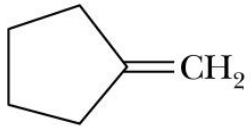


3-Metilciclopentene
(non 5-metilciclopentene)



4-Etil-1-metilcicloesene
(non 5-etil-2-metilcicloesene)

Residui alchenilici

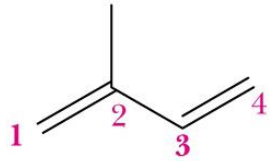
Gruppo alchenilico	Nome comune	Esempio	Nome comune
$CH_2{=}CH{-}$	Vinile		Vinilciclopentano
$CH_2{=}CHCH_2{-}$	Allile		Allilciclopentano
$CH_2{=}$	Metilene		Metilenciclopentano

$H{-}C{\equiv}C{-}$ etinile

Nomenclatura dieni

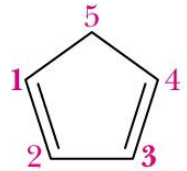
$CH_2{=}CHCH_2CH{=}CH_2$

1,4-Pentadiene



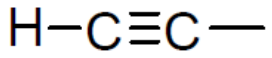
$CH_2{=}C(CH_3)CH{=}CH_2$

2-Metil-1,3-butadiene
(isoprene)

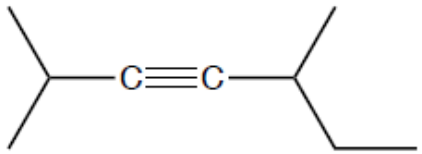


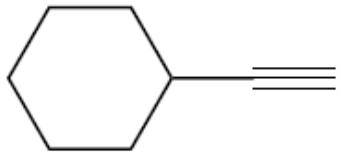
1,3-Ciclopentadiene

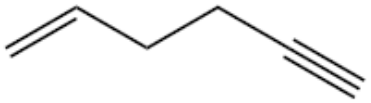
Nomenclatura



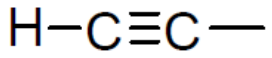
etinile



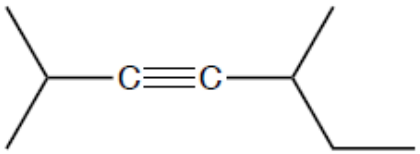




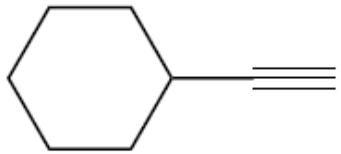
Nomenclatura



etinile

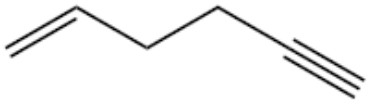


2,5-dimetil-3-eptino



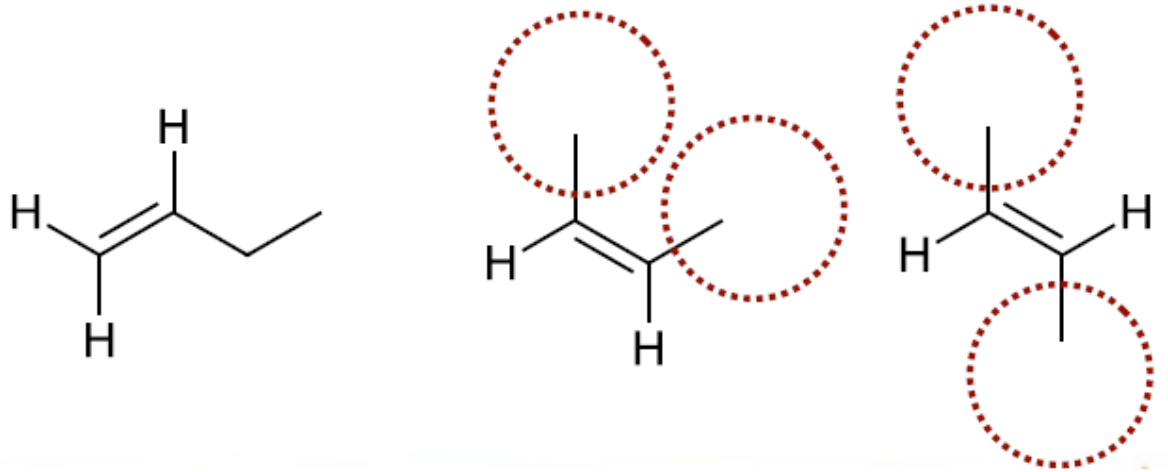
etinilcicloesano

1,3-esdiino



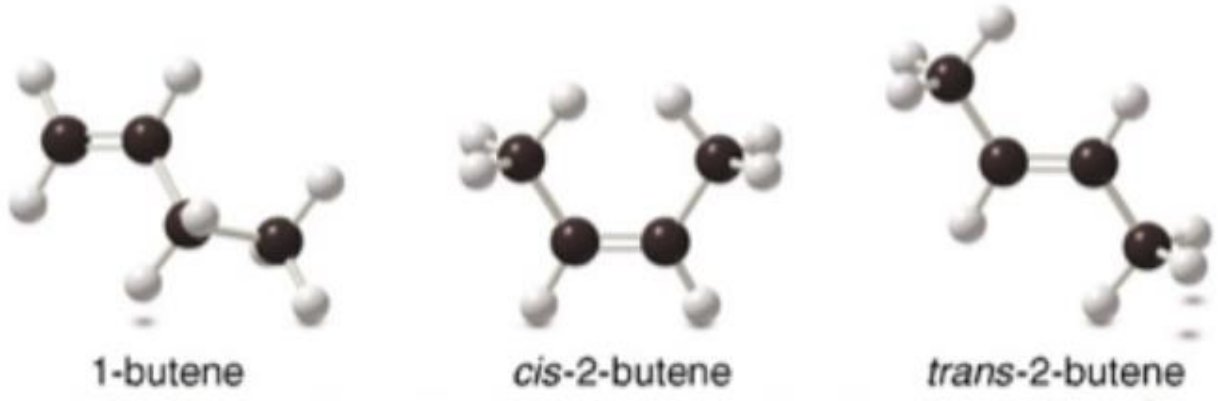
1-esen-5-ino

Isomeria geometrica

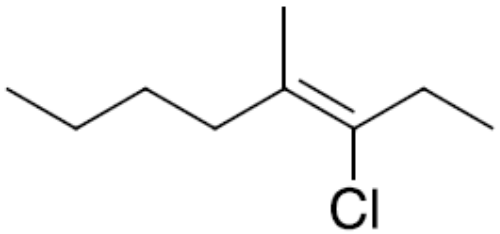


Gli alcheni più sostituiti sono più stabili
Gli alcheni *trans* sono più stabili dei *cis*

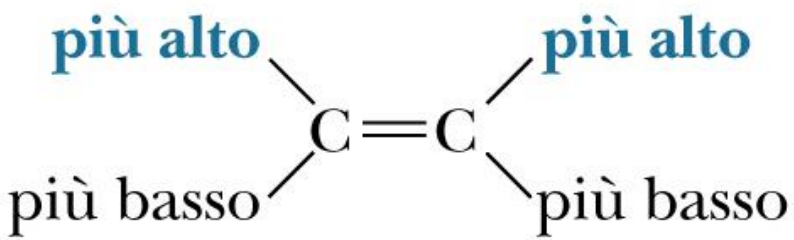
Aumento della stabilità



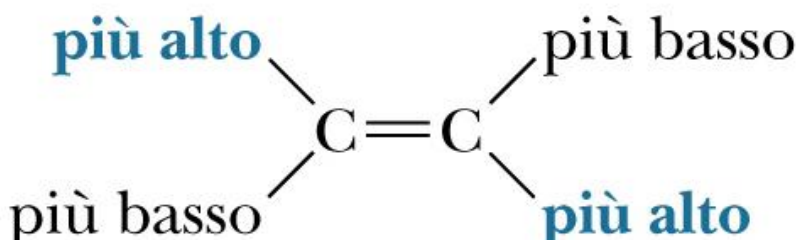
Nomenclatura *E*/*Z* per alcheni tri- e tetra-sostituiti



cis o *trans*?



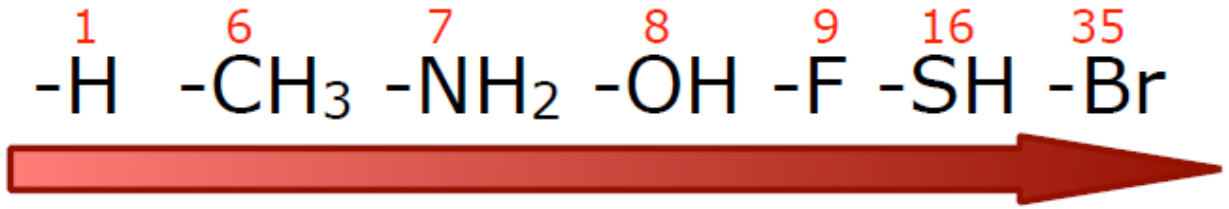
Z *(zusammen)*



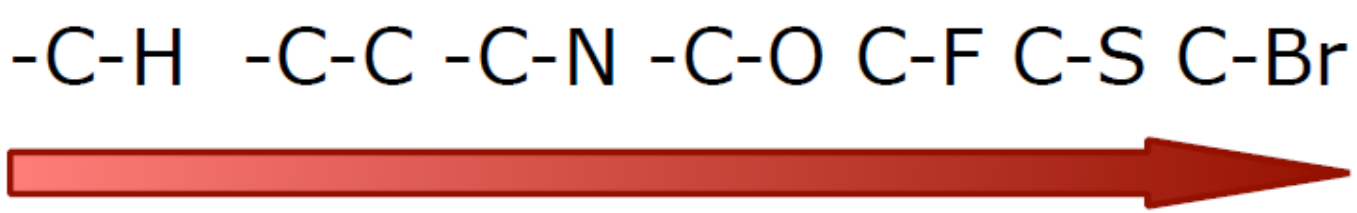
E *(entgegen)*

Regole di priorità

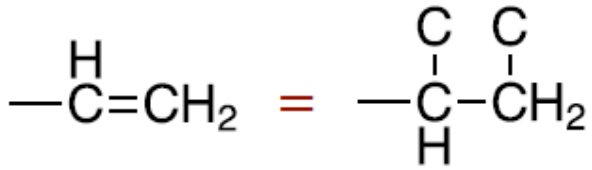
1. Numero atomico del primo atomo del sostituente

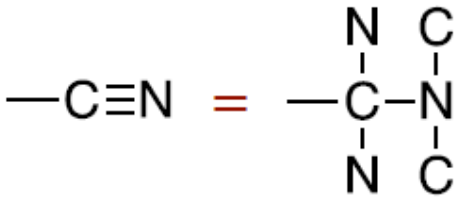


2. Numero atomico del secondo atomo del sostituente

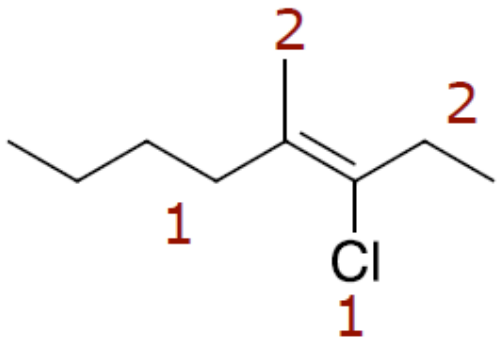


3. Legami multipli = n legami singoli



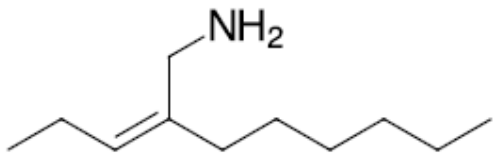


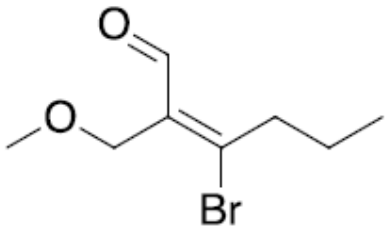
Nomenclatura *E*/*Z* per alcheni tri- e tetra-sostituiti

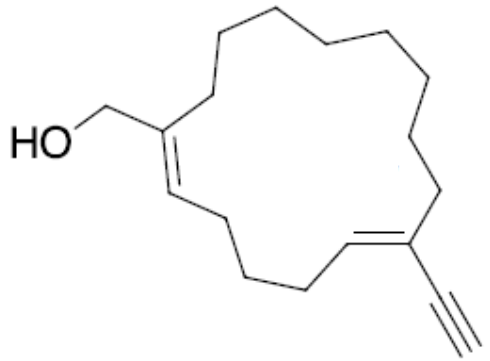


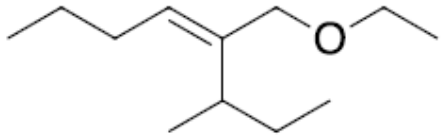
Z-3-cloro-4-metil-3-ottene

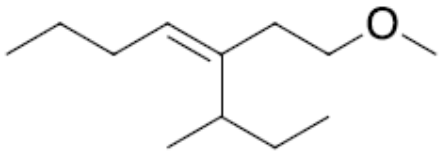
E o *Z* ?



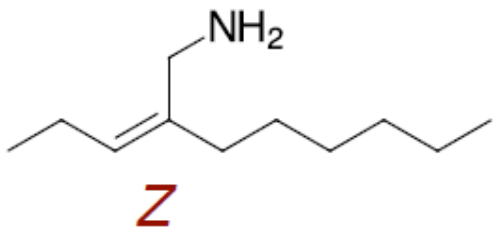








E o *Z* ?



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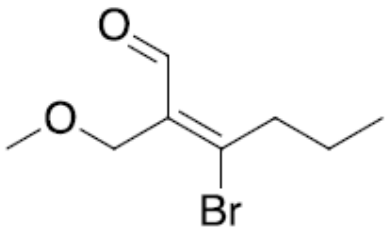

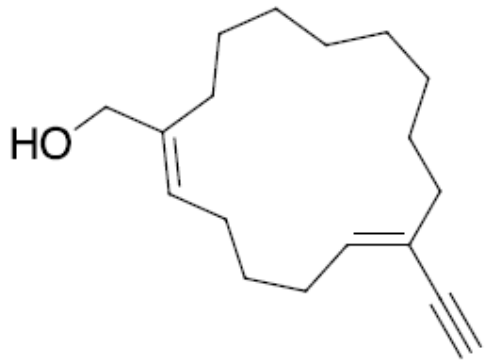

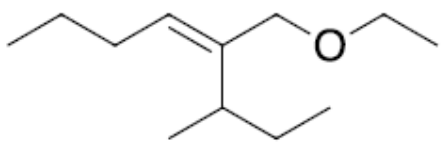

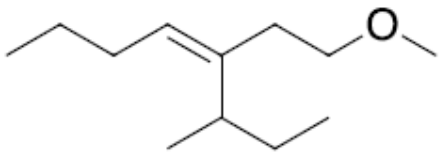

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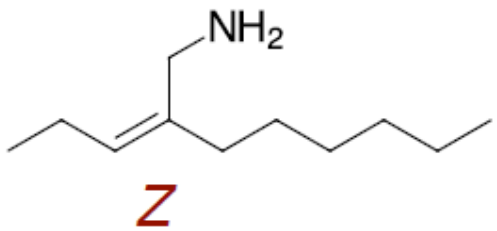

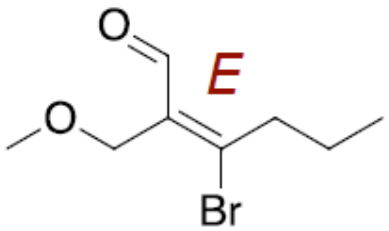

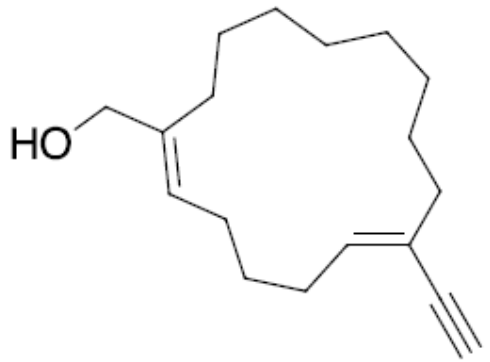

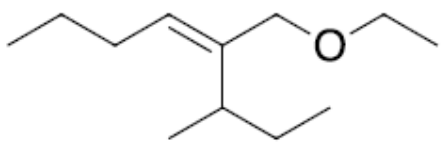

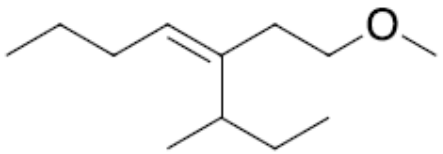

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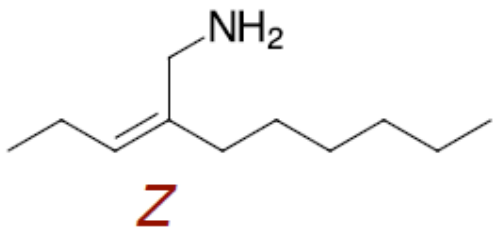

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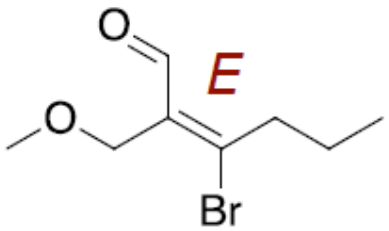

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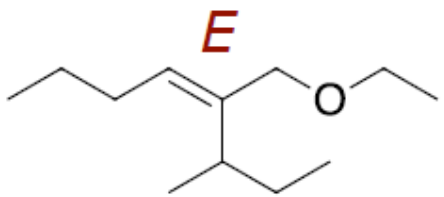

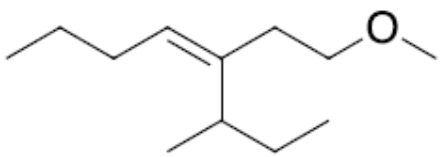

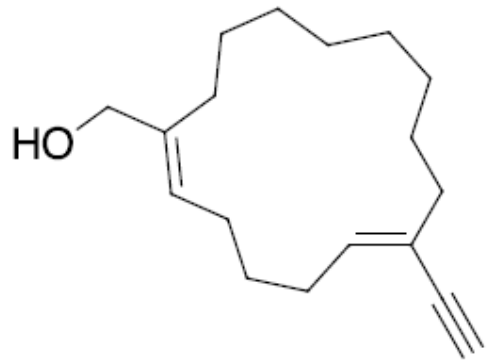

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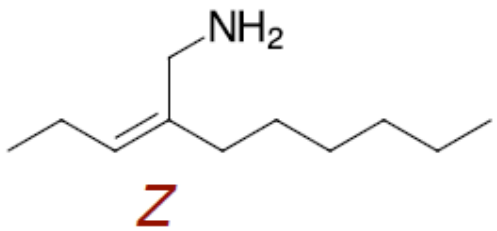

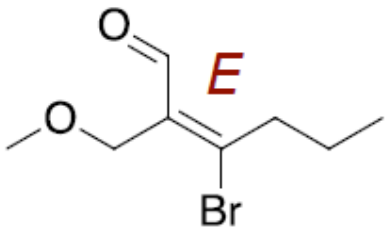

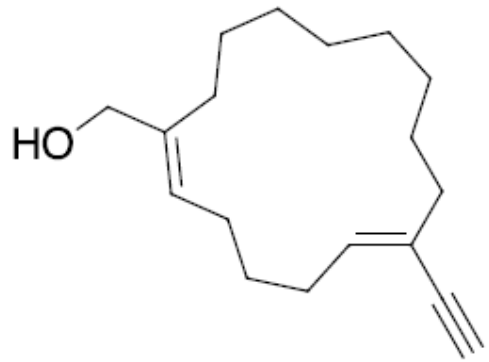

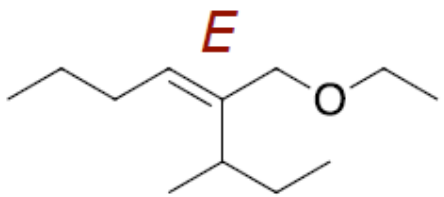

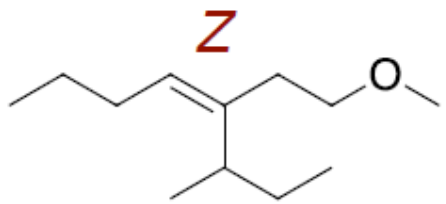

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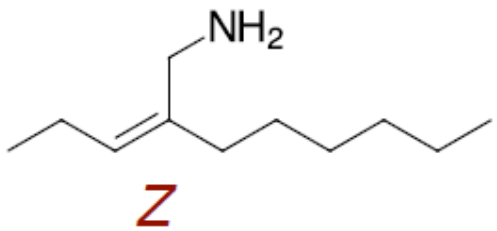
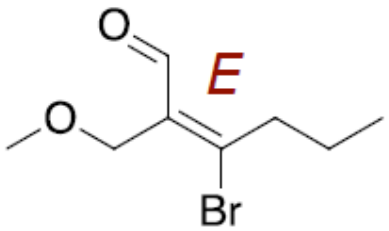
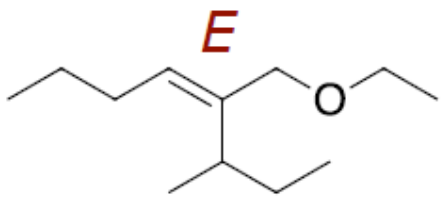
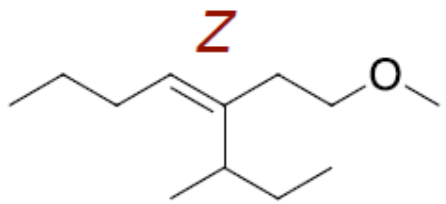
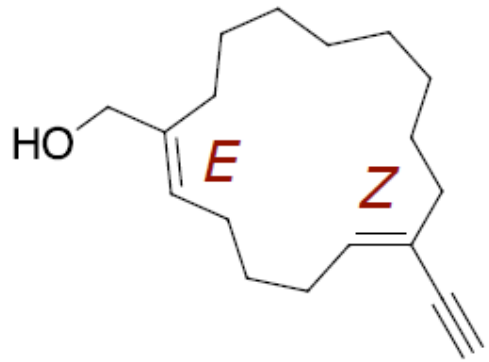




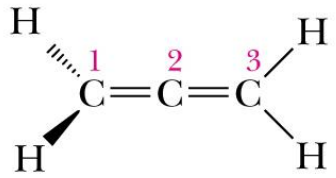






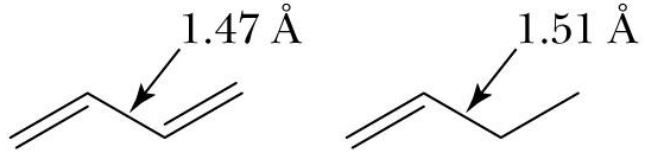
Dieni

- Diene cumulato
  - Propadiene (allene)



1,2-Propadiene
(allene)

- Diene coniugato
  - 1,3-butadiene
  - Elettroni π delocalizzati



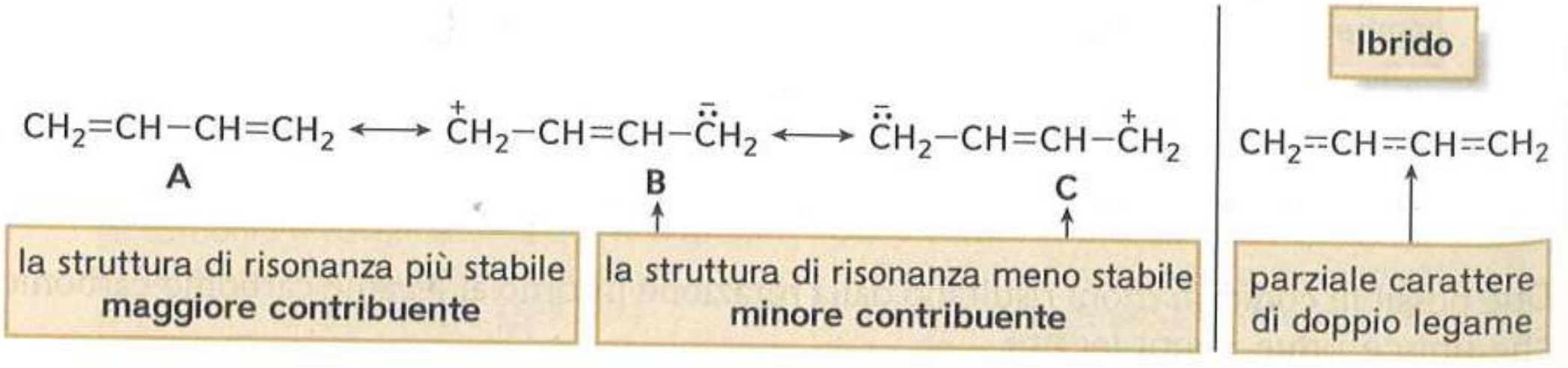
1,3-Butadiene 1-Butene

- Diene isolato
  - 1,4-Pentadiene

$CH_2{=}CHCH_2CH{=}CH_2$

1,4-Pentadiene

Diene coniugato:1,3-butadiene



Completare con le frecce

Proprietà fisiche

- Simili a quelle degli alcani di peso molecolare comparabile
- Alcheni e alchini hanno punti di fusione e di ebollizione bassi
- P.f. e p.e. aumentano all'aumentare del numero di atomi di carbonio perché aumenta l'area superficiale
- Sono solubili in solventi organici e insolubili in acqua