

Chimica dei composti del carbonio

14

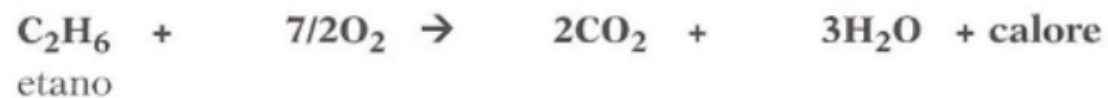
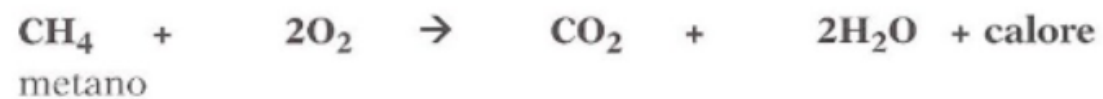
ALCANI

Le **reazioni** principali degli alcani sono:

combustione (ossidazione)

sostituzione (*L'alogenazione*)

cracking

ALCANI**reazioni****combustione (ossidazione)**

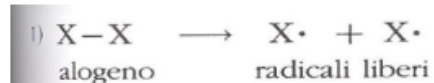
reazioni

Le **reazioni** principali degli alcani sono: **sostituzione radicalica**

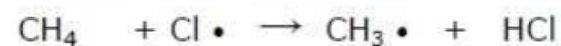
L'alogenazione è considerata la più utile reazione di sostituzione.

Le fasi reattive

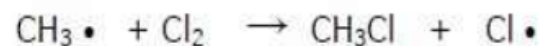
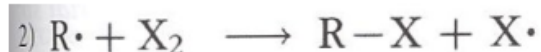
1. formazione di radicali;
2. inizio;



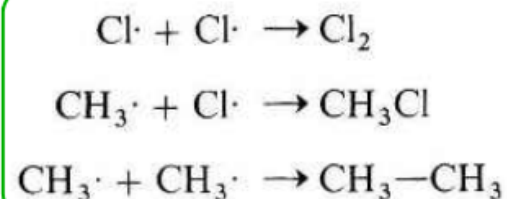
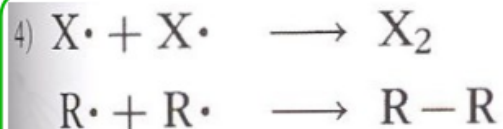
3. propagazione;



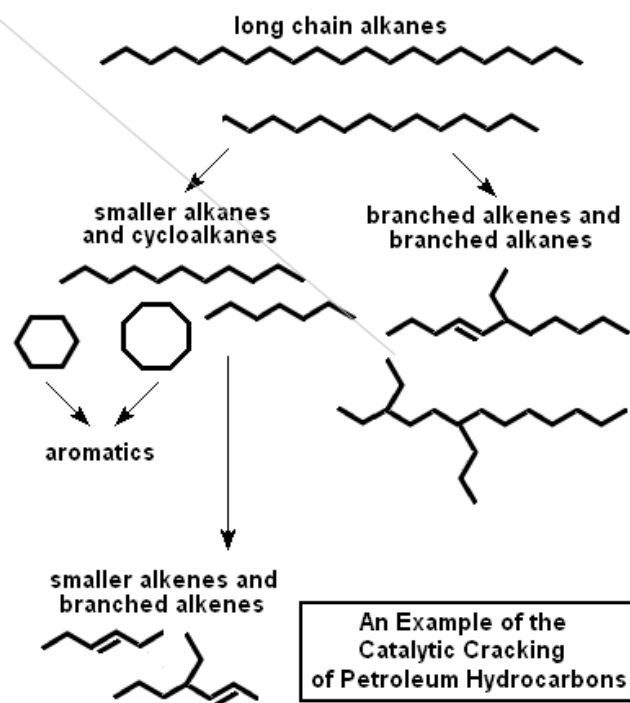
4. terminazione.

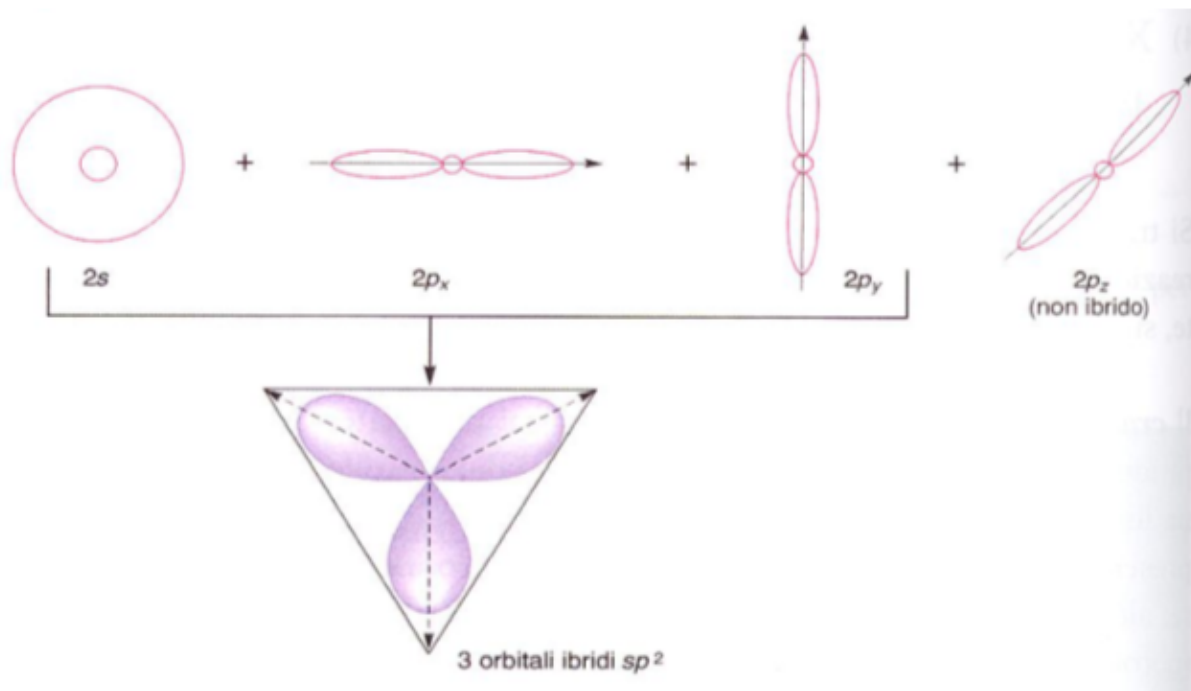
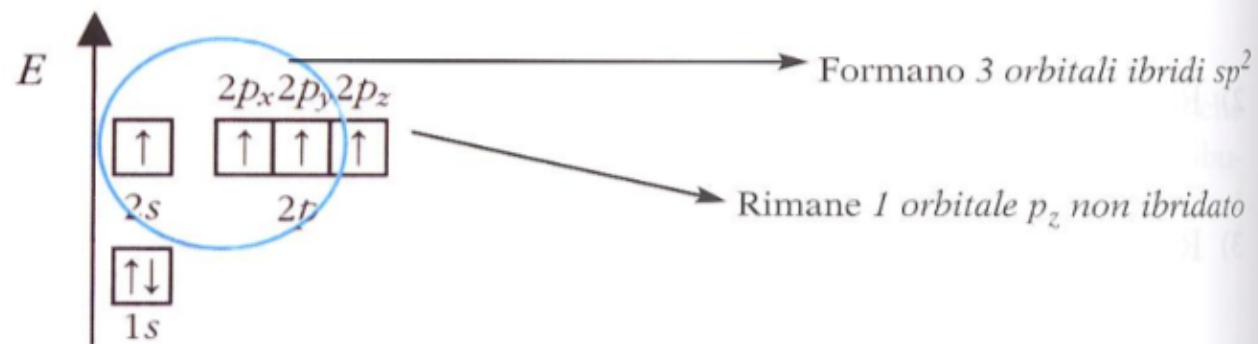
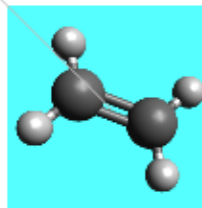
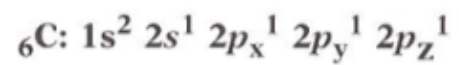


viene terminata per accoppiamento di due radicali:

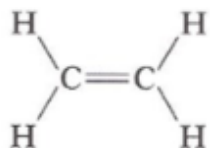


cracking



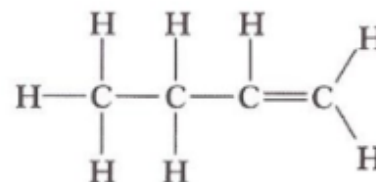
ALCHENI

etene

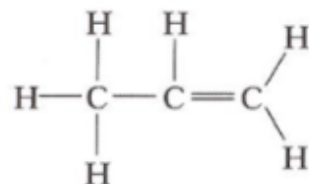


ALCHENI

1-butene



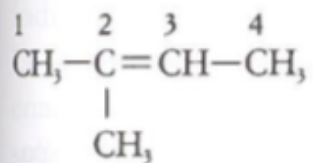
propene



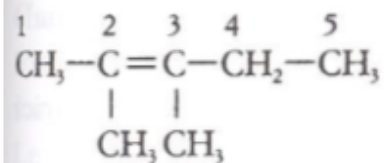
La nomenclatura IUPAC degli alcheni

- 1) il nome di un alchene deriva da quello dell'alcano corrispondente (con lo stesso n. di atomi di C), ma **termina in -ene** (invece di -ano).
- 2) la numerazione degli atomi di C inizia dall'estremità più vicina al doppio legame;
- 3) negli alcheni con 4 o più atomi di C, il nome è accompagnato da un n. che indica la posizione del doppio legame lungo la catena.

ALCHENI

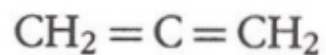


ene



ene

con due doppi legami C=C per molecola sono chiamati *dieni*



diene

Gli alcheni a catena chiusa sono detti **cicloalcheni**



cicloesene

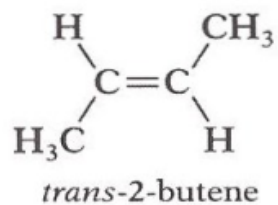
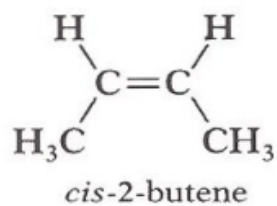
ISOMERI

STEREoisomeri

possono essere

isomeri
geometrici

isomeria: cis / trans



enantiomeri



isomeri: otticamente attivi
ruotano il piano della luce polarizzata

isomero destrogiro (+): lo ruota di un angolo positivo

isomero levogiro (-): lo ruota di un angolo negativo

reazioni

degli alcheni

addizione elettrofila

del bromo

degli acidi alogenidrici

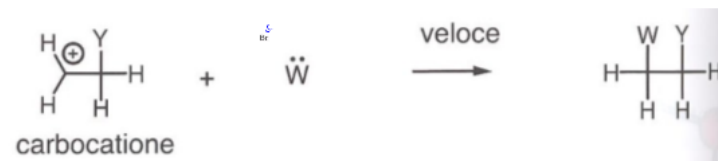
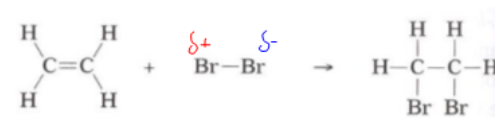
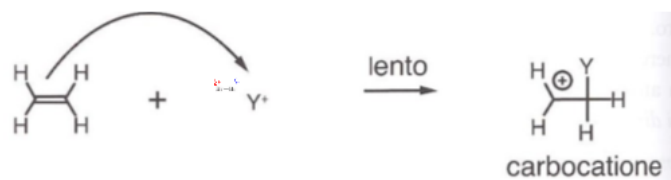
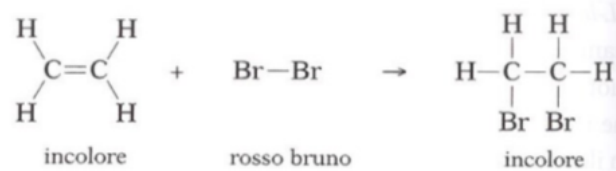
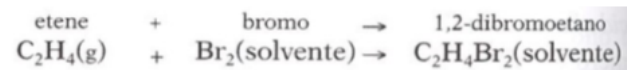
REGOLA DI MARKOVNIKOV

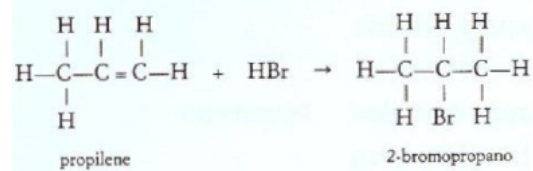
idrogenazione

riduzione catalitica

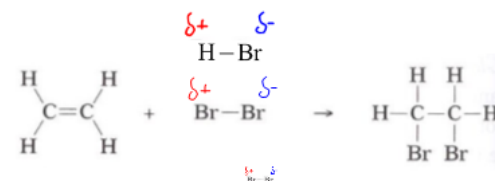
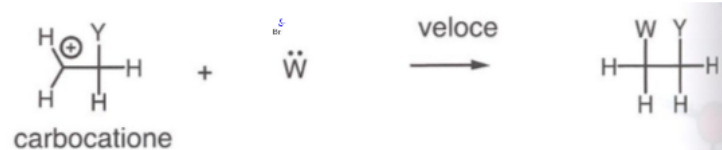
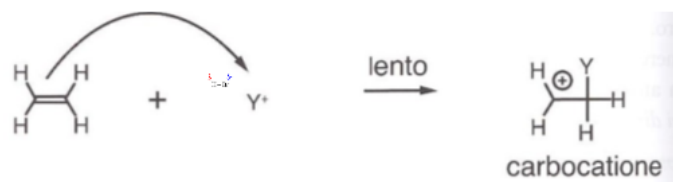
addizione elettrofila

del bromo



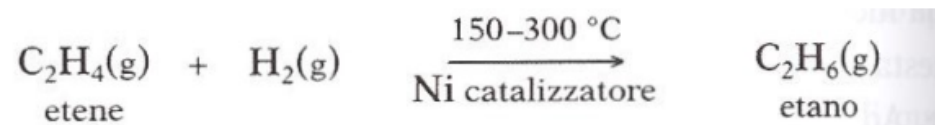
addizione elettrofiladegli acidi alogenidrici **REGOLA DI MARKOVNIKOV**

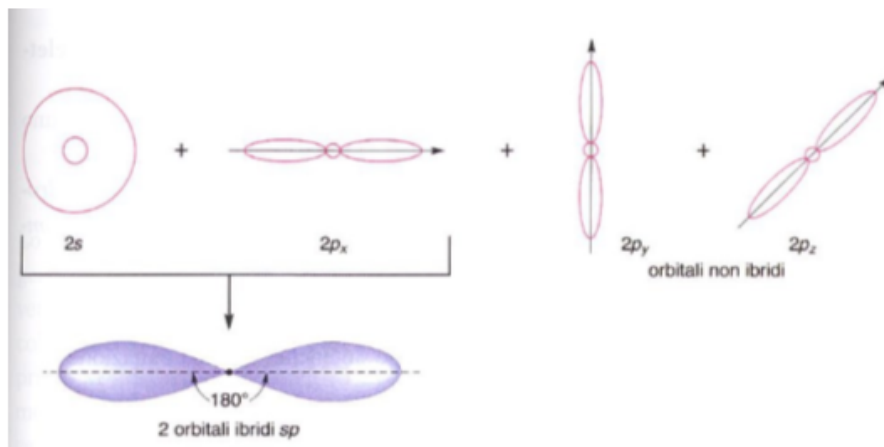
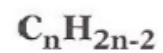
"quando un acido alogenidrico si aggiunge al doppio legame di un alchene, l'atomo di alogeno si lega **sempre** con l'atomo di carbonio più povero di idrogeno".



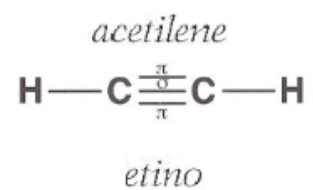
idrogenazione

riduzione catalitica



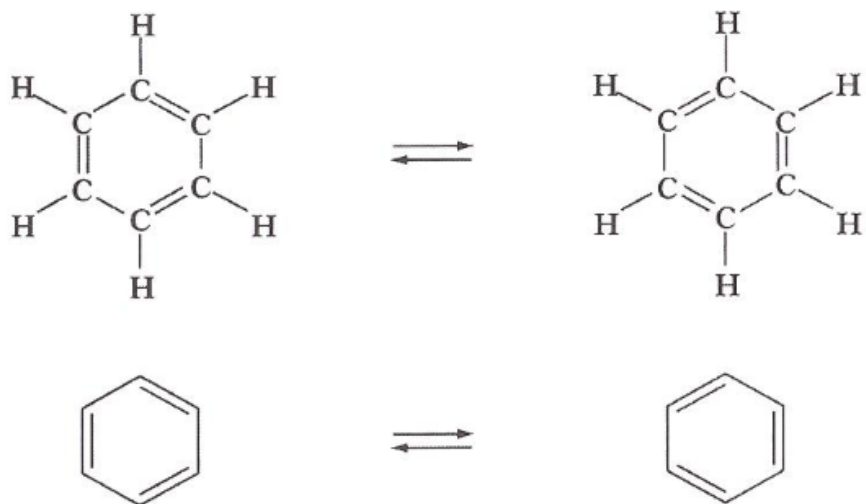
ALCHINI**reazioni**

addizione elettrofila
idrogenazione



IDROCARBURI AROMATICI

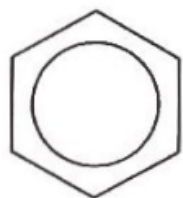
Il **benzene** fu identificato per la prima volta nel 1825 dal giovane **Michael Faraday** e la sua formula bruta **C₆H₆** fu determinata nel 1834.



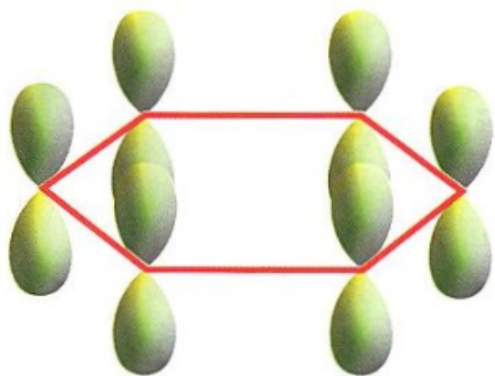
nel 1865 il chimico tedesco **Friedrich August Kekulé** propose per la molecola del benzene due strutture equivalenti in continua trasformazione l'una nell'altra.

Linus Pauling nel 1931

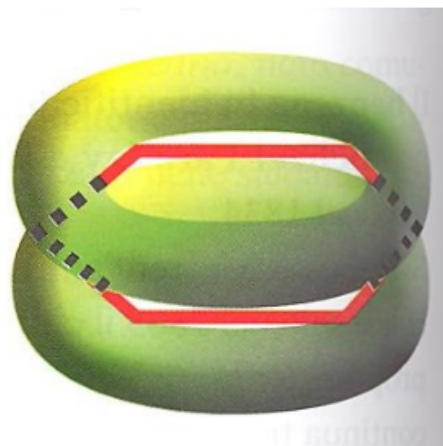
ibrido di risonanza,



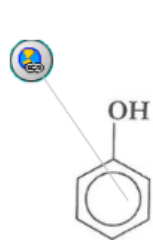
struttura planare.



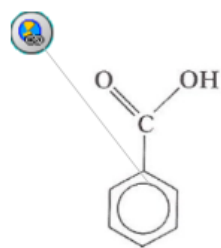
delocalizzazione degli orbitali π



due toroidi sopra e sotto la molecola

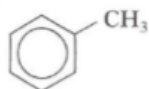


fenolo



acido benzoico

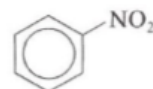
2) Esempio di derivati monosostituiti del benzene:



metilbenzene o toluene

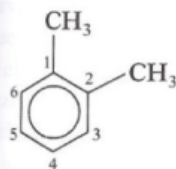
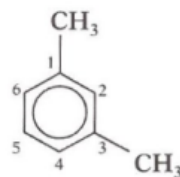
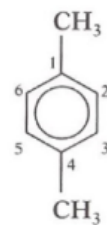


clorobenzene

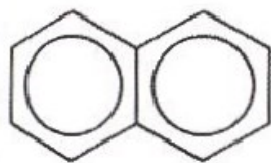


nitrobenzene

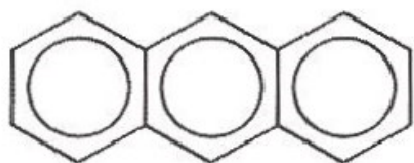
3) Esempio di tre isomeri del *dimetilbenzene*. Sotto la nomenclatura IUPAC c'è la nomenclatura tradizionale: *xilene* con i tre isomeri *orto*, *meta* e *para* (abbreviati in *o-*, *m-*, *p-*).

1,2-dimetilbenzene
o-xilene1,3-dimetilbenzene
o m-xilene1,4-dimetilbenzene
o p-xilene

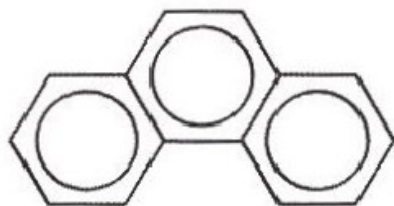
aromatici policiclici



naftalene (o naftalina)



antracene



fenantrene