

Chimica dei composti del carbonio

14

ALCANI

Le **reazioni** principali degli alcani sono:

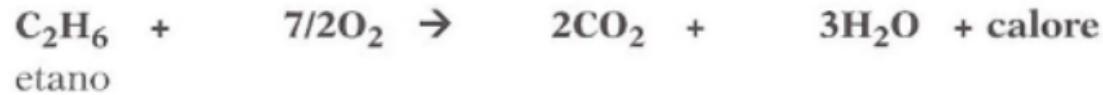
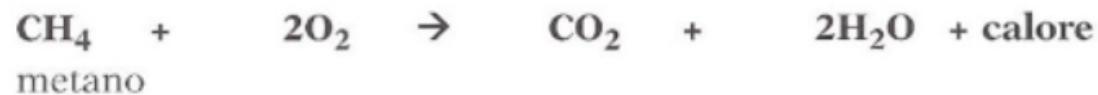
combustione (ossidazione)

sostituzione (L'alogenazione)

cracking

ALCANI**reazioni**

10

combustione (ossidazione)

reazioni

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

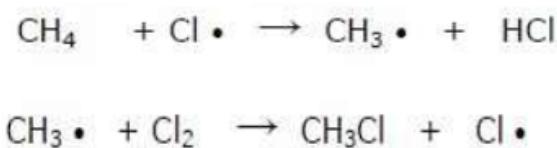
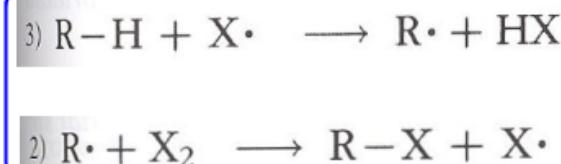
L'alogenazione è considerata la più utile reazione di sostituzione.

Le fasi reattive

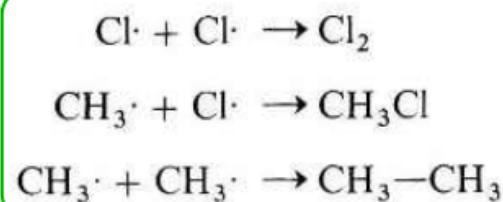
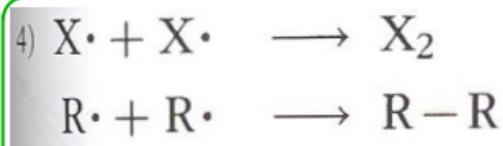
1. formazione di radicali;
2. inizio;



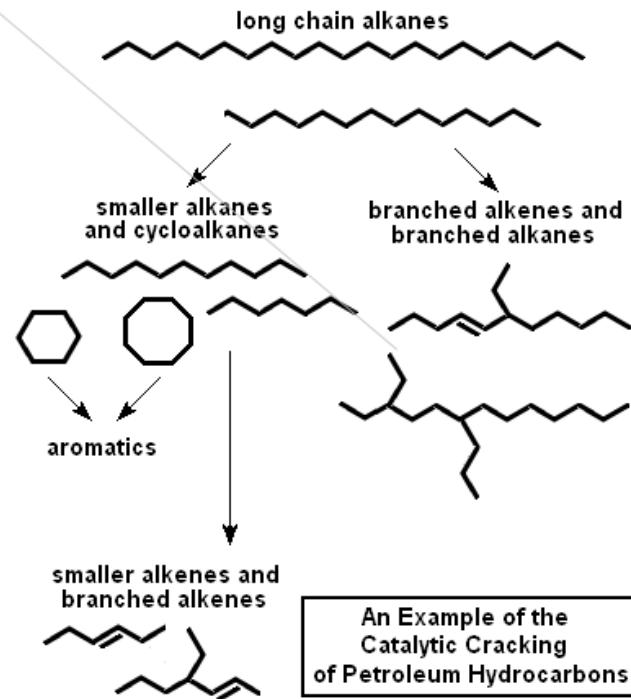
3. propagazione;
4. terminazione.



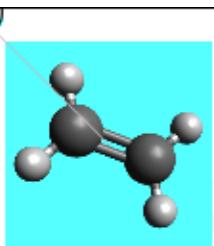
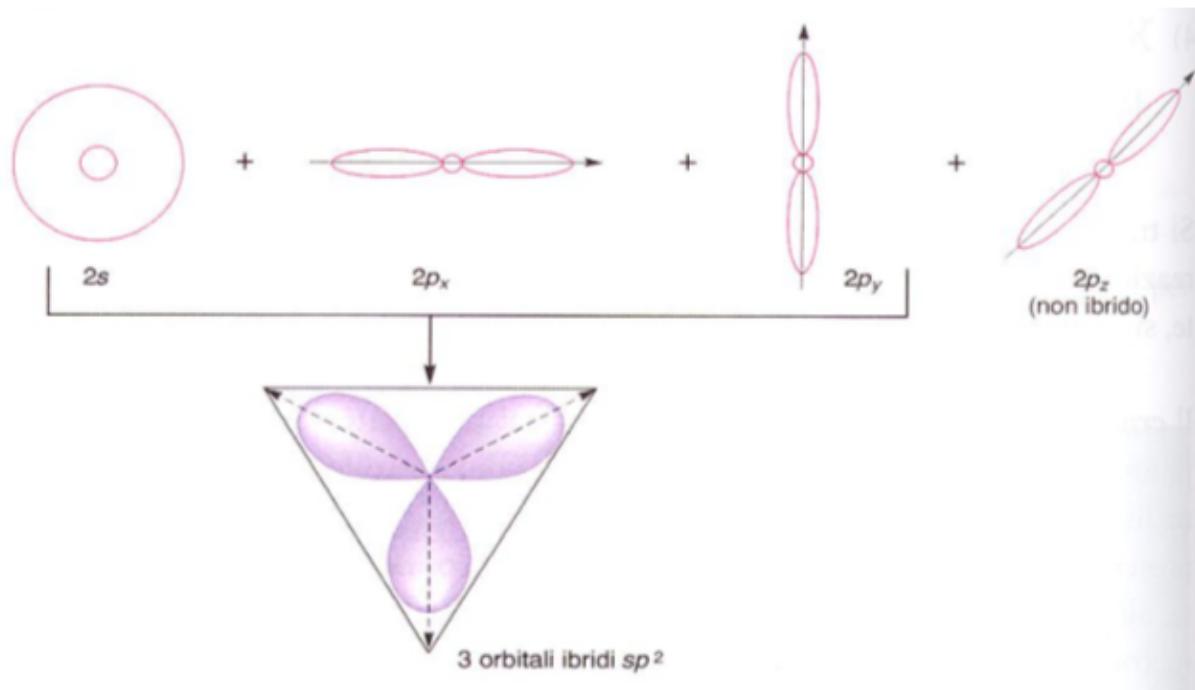
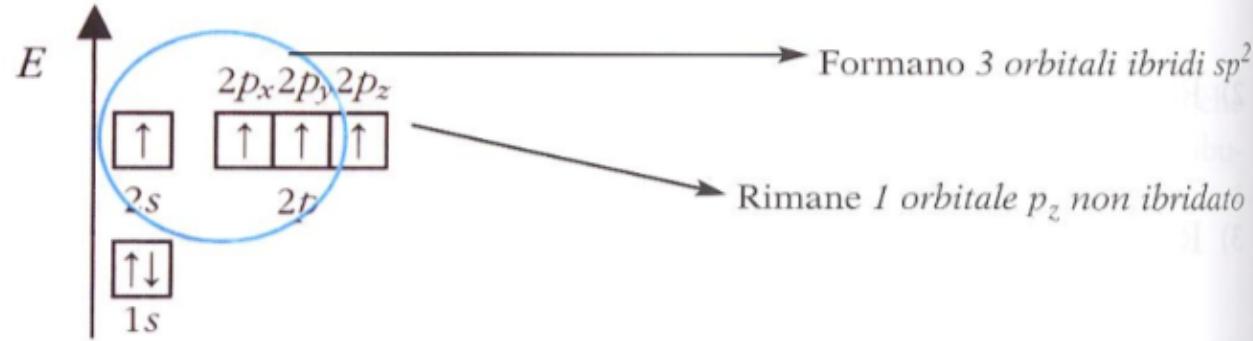
viene terminata per accoppiamento di due radicali:



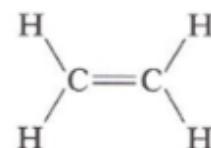
cracking



ALCHENI

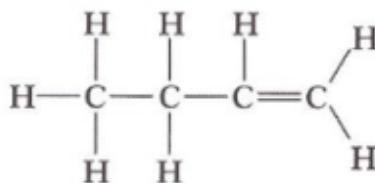
 C_nH_{2n}  ${}_6C: 1s^2 \ 2s^1 \ 2p_x^1 \ 2p_y^1 \ 2p_z^1$ 

etene
butene

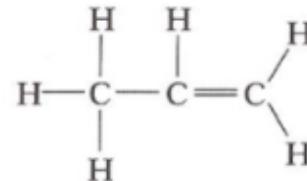


ALCHENI

1-butene



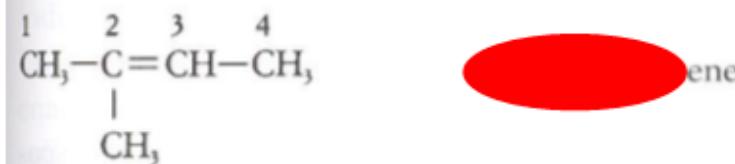
propene



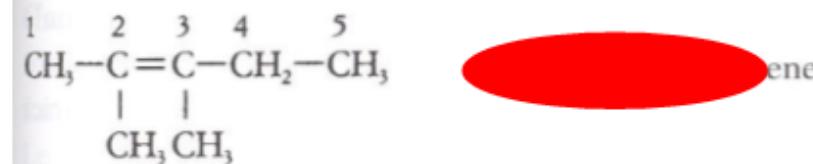
La nomenclatura IUPAC degli alcheni

- 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

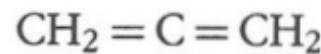


ene



ene

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



diene



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



cicloesene

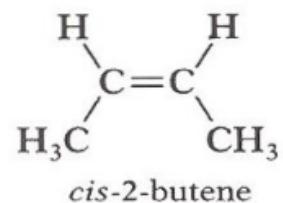
ISOMERI

STEREOISOMERI

possono essere

isomeri
geometrici

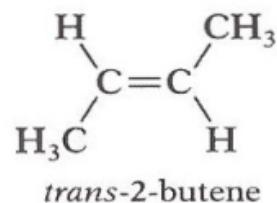
isomeria: cis / trans



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

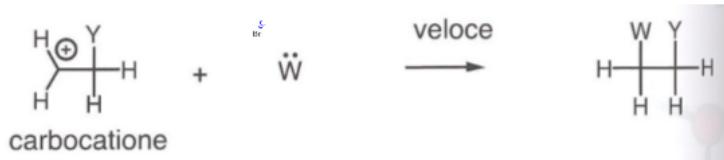
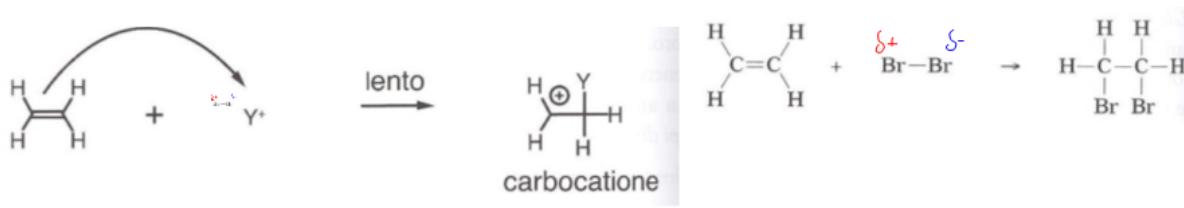
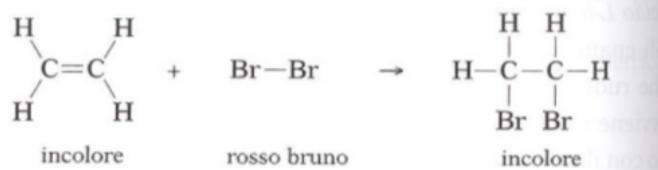
[REGOLA DI MARKOVNIKOV](#)

idrogenazione

riduzione catalitica

addizione elettrofila

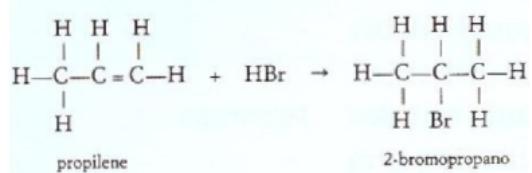
del bromo



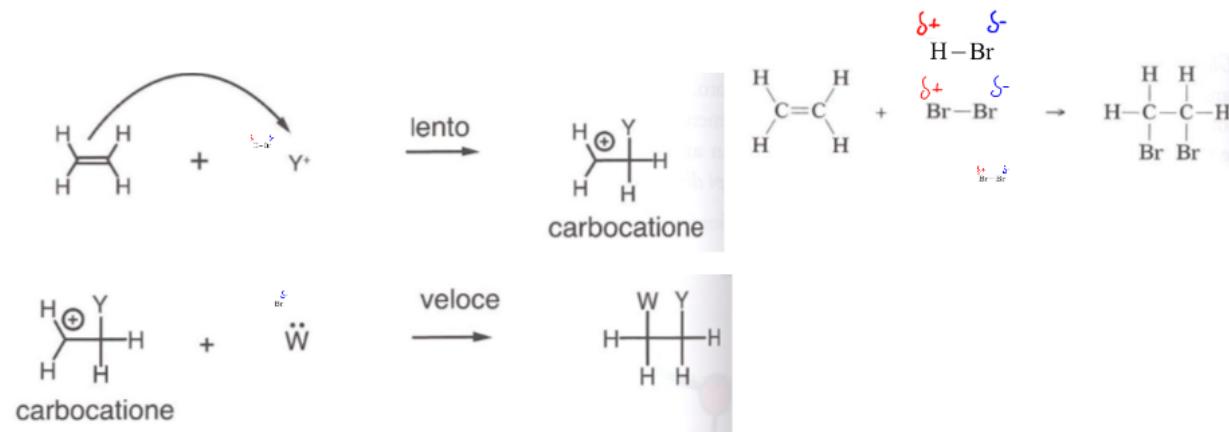
addizione eletrofilica

degli acidi alogenidrici

REGOLA DI MARKOVNIKOV

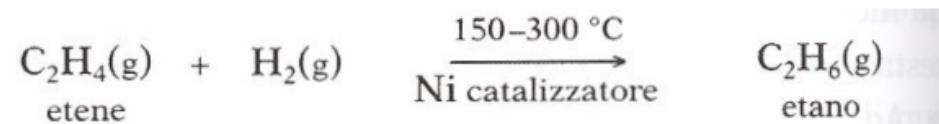


"quando un acido alogenidrico si addiziona al doppio legame di un alchene, l'atomo di alogeno si lega **sempre** con l'atomo di carbonio più povero di idrogeno".

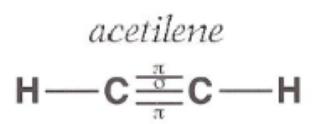
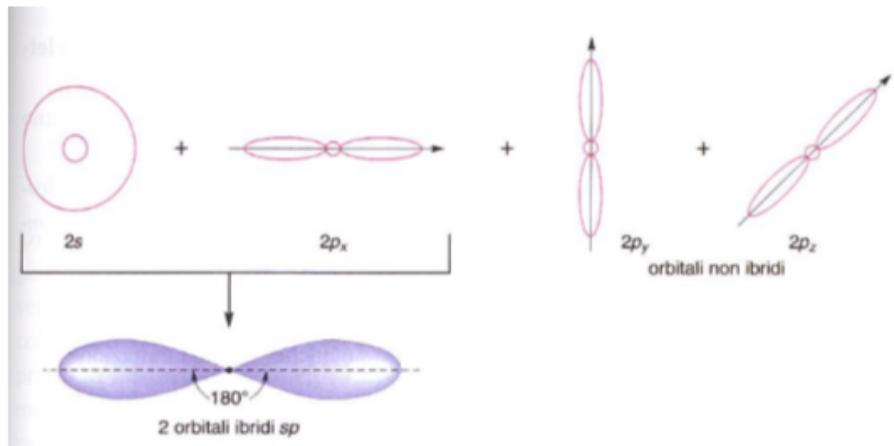


idrogenazione

riduzione catalitica



ALCHINI



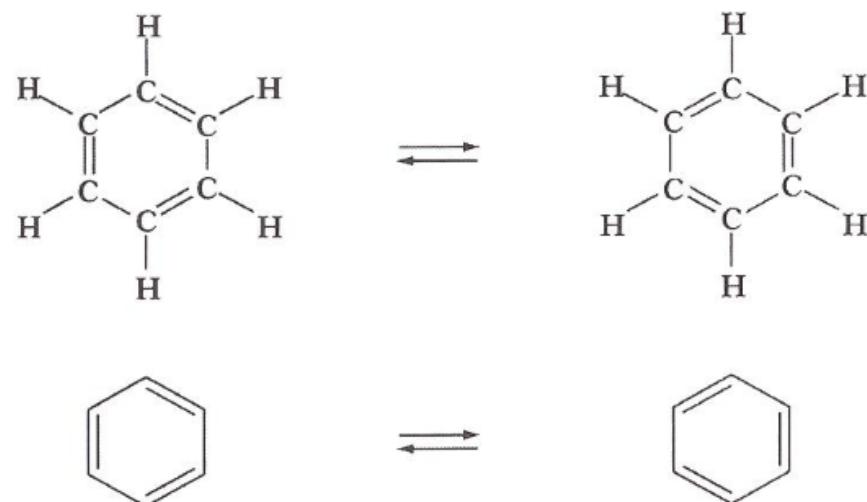
etino

reazioni

addizione elettrofila
idrogenazione

IDROCARBURI AROMATICI

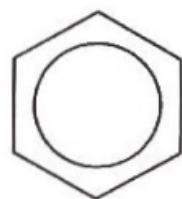
Il **benzene** fu identificato per la prima volta nel 1825 dal giovane **Michael Faraday** e la sua formula bruta **C₆H₆** fu determinata nel 1834.



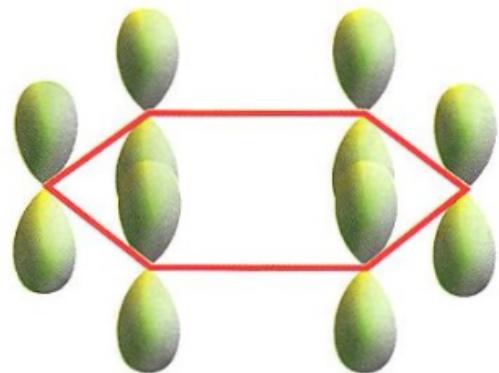
nel 1865 il chimico tedesco **Friedrich August Kekulé** propose per la molecola del benzene due strutture equivalenti in continua trasformazione l'una nell'altra.

Linus Pauling nel 1931

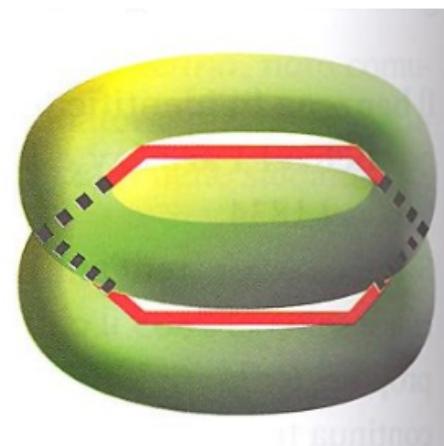
ibrido di risonanza,



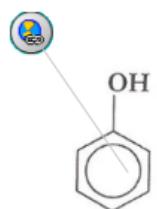
struttura planare.



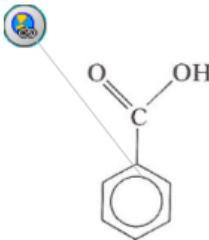
delocalizzazione degli orbitali π



due toroidi sopra e sotto la molecola

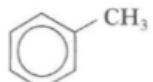


fenolo

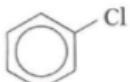


acido benzoico

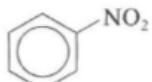
2) Esempio di derivati monosostituiti del benzene:



metilbenzene o toluene

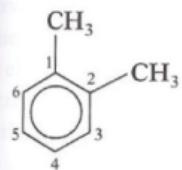
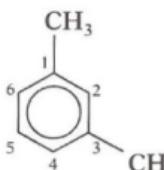


clorobenzene

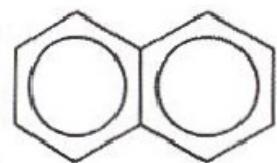


nitrobenzene

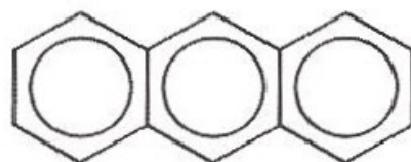
3) Esempio di tre isomeri del *dimetilbenzene*. Sotto la nomenclatura IUPAC c'è la nomenclatura tradizionale: *xilene* con i tre isomeri *orto*, *meta* e *para* (abbreviati in *o*-, *m*-, *p*-).

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

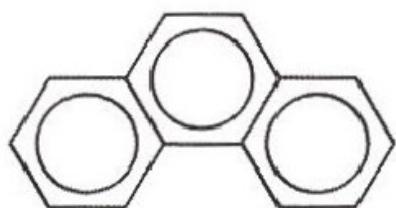
aromatici policiclici



naftalene (o naftalina)



antracene



fenantrene