DIENI

DI + ENE
2 doppi legami

Per es DIOLO
2 gruppi OH

DIENI — CUMULATI $H_2C=C=CH_2$ ALLENI — 2 doppi legami consecutivi

— CONIUGATI $H_2C=CH-CH=CH_2$ — Tra i 2 doppi legami esiste 1 solo legame σ

— ISOLATI $H_2C=CH-CH_2-CH=CH_2$ — Tra i 2 doppi legami esistono più legami σ

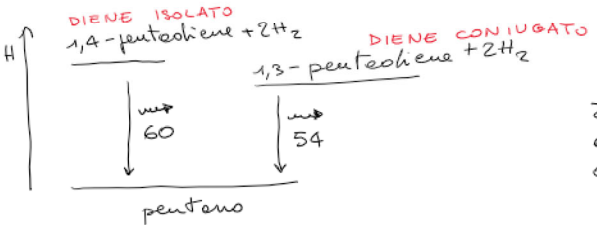
① ② ③ ④
$CH_2=CH-CH=CH_2$ 1,3-buta diene

① 2 3 ④ 5
$H_2C=CH-CH_2-CH=CH_2$ 1,4-pentadiene

I dieni coniugati sono più stabili e più reattivi dei dieni isolati.

$CH_2=CH-CH=CH-CH_3$ (1,3-pentadiene) $+ 2H_2 \xrightarrow{Pt} CH_3CH_2CH_2CH_2CH_3$ $\Delta H = -54$ kcal/mole

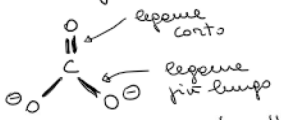
$CH_2=CH-CH_2-CH=CH_2$ (1,4-pentadiene) $+ 2H_2 \xrightarrow{Pt} CH_3CH_2CH_2CH_2CH_3$ $\Delta H = -60$ kcal/mole



Il diene coniugato è più stabile del diene isolato perché stabilizzato per risonanza

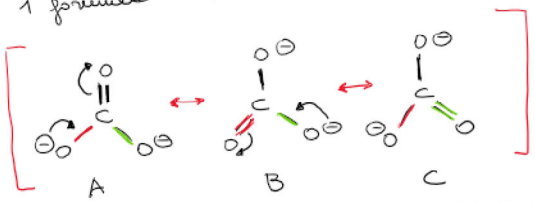
TEORIA DELLA RISONANZA

Esempio: IONE CARBONATO CO_3^{2-}



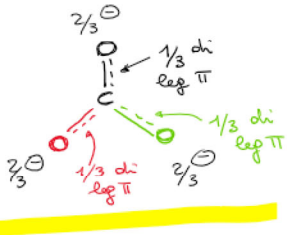
Dati sperimentali dimostrano che tutti i legami C-O sono della stessa lunghezza

1 formula di struttura



↔ risonanze
⇌ equilibrio chimico

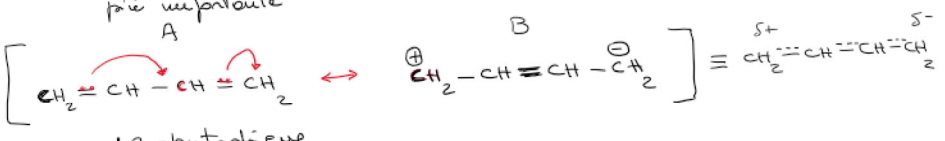
FORMULE LIMITE DI RISONANZA

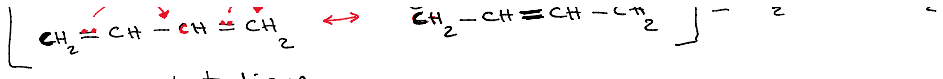


Elettroni "mobili"
doppietti π
cariche ⊖
elettroni spaiati
doppietti non condivisi $-\ddot{N}-$ $-\ddot{O}-$

RINOCERONTE = [DRAGO ↔ UNICORNO]

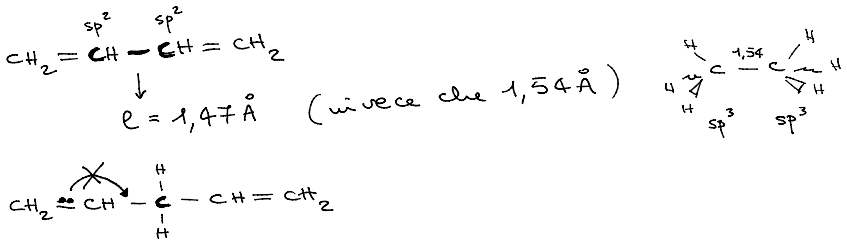
più importante



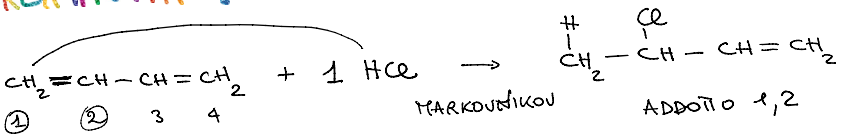


1,3-butadiene
È stabilizzato per risonanza

A è più importante perché NEUTRA mentre B presenta SEPARAZIONE INTERNA DI CARICA inoltre presenta 2 legami π invece che 1

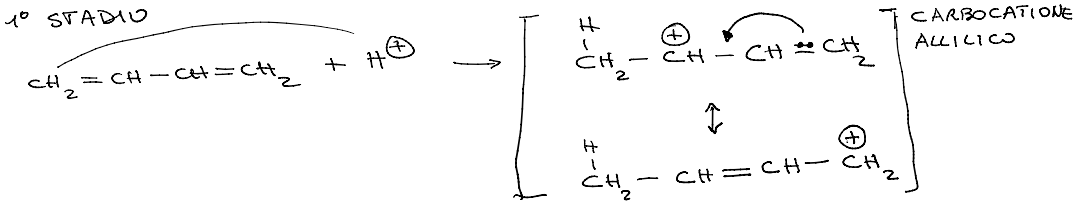


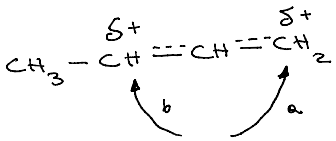
REATTIVITÀ : IDROALOGENAZIONE



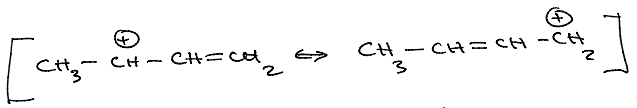
Meccanismo Bistadio

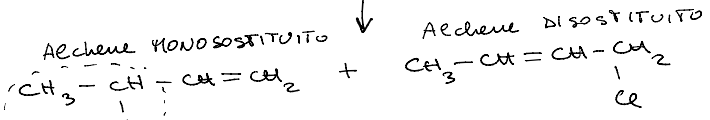
1° STADIO





2° STADIO



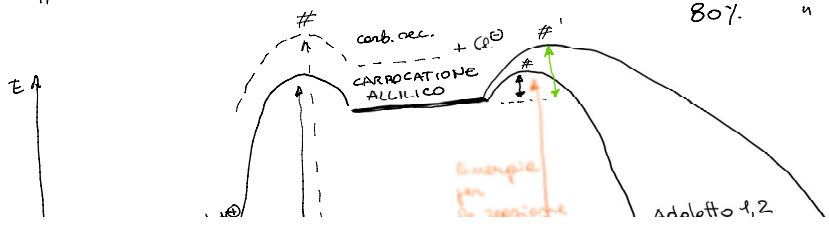


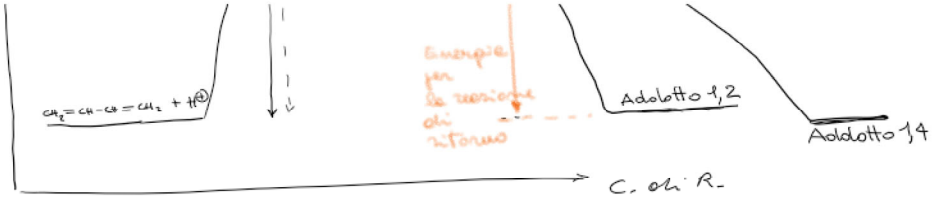
Addotto 1,2
PRODOTTO CINETICO
Si forma più velocemente

Addotto 1,4
PRODOTTO TERMODINAMICO
È più stabile

Se eseguo la reazione a 40°C ottengo 80% addotto 1,4
20% " 1,2

" " " " " -80°C ottengo 20% addotto 1,4
80% " 1,2



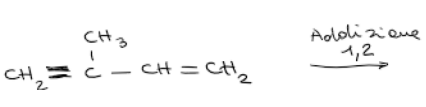


A temperature -80°C la reazione è irreversibile
A temperature 40°C la reazione è reversibile

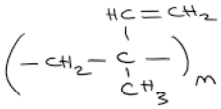
1° stadio

Carbocatione secondario

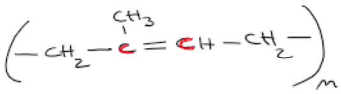
Polimerizzazione dei dieni coniugati

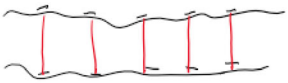


ISOPRENE



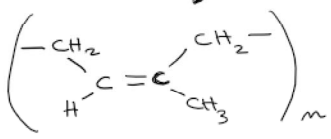
Poli vinil profilene





- legami trasversali covalenti
RETICOLAZIONE

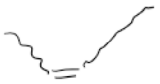
Poli isoprene

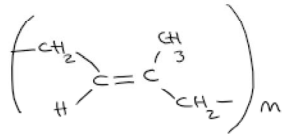


cis

GOMMA NATURALE

Elastica

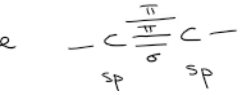




trans

GUTTAPERCA
(palline da golf)
Rigida

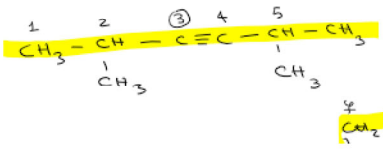
ALCHINI $C_n H_{2n-2}$

Gruppo funzionale: Triplo legame 

Nomenclatura IUPAC

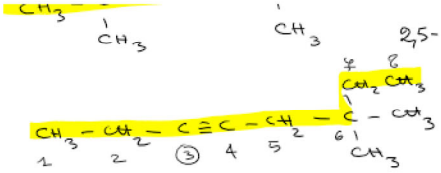
Desinenza: -INO

f. bruta	f. struttura	Nome IUPAC	Nome Comune	
C_2H_2	$H-C\equiv C-H$	Et INO	Acetilene	Fiamma a 2800°C
C_3H_4	$CH_3-C\equiv C-H$	Prop INO		
C_4H_6	$CH_3-CH_2-C\equiv C-H$	1-But INO	(Alchino Terminale)	
	$CH_3-C\equiv C-CH_3$	2-But INO	(Alchino non terminale)	



3-esINO

2,5-dimetil-3-esino



2,5-dimetil-3-esino

3-ottino

6,6-dimetil-3-ottino