venerdì 11 aprile 2025 14:32

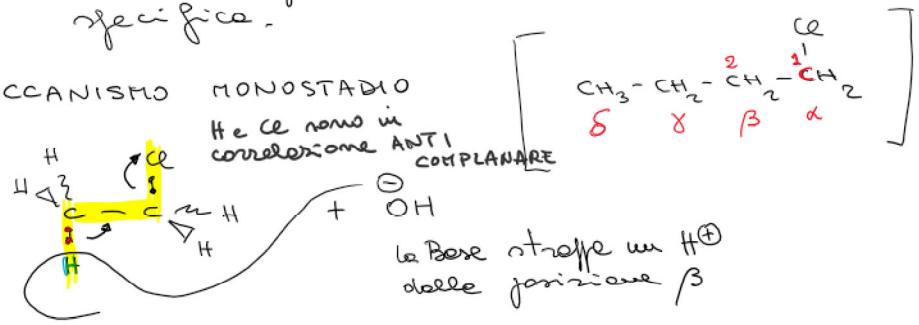
β-ELIMINAZIONI
- E1 MONOMOLECOLARE BISTADIO
- E2 BIMOLECOLARE MONOSTADIO

E2

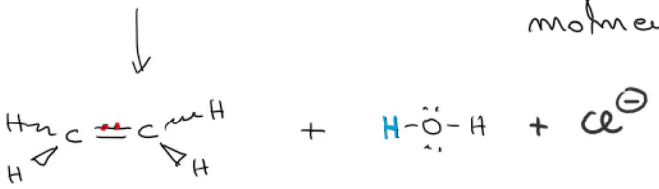
Caratteristiche:

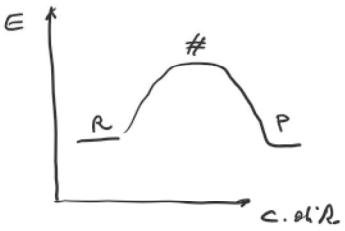
1. Substrato preferito: Terziario
2. Base forte
3. Cinetica della reazione è del 2° ordine
   $v = k [sub.] [Base]$
4. Solvente preferito: polare aprotico (anche polari protici)
5. Favorita da T alte.
6. Reazione regioselettiva e stereoselettiva/stereospecifica.

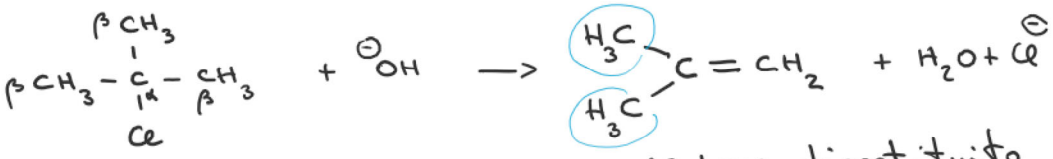
MECCANISMO MONOSTADIO



Meccanismo CONCERTATO: Tutti gli eventi hanno luogo nel medesimo momento







Alchene disostituito più stabile dell'etilene

2 Reagenti — 3 Prodotti

Per una reazione spontanea $\Delta G < 0$

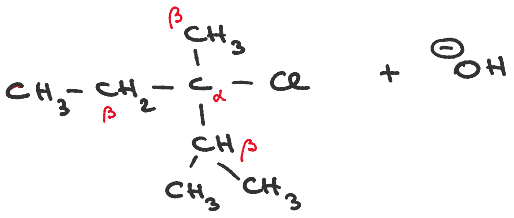
$\Delta G = \Delta H - T\Delta S$

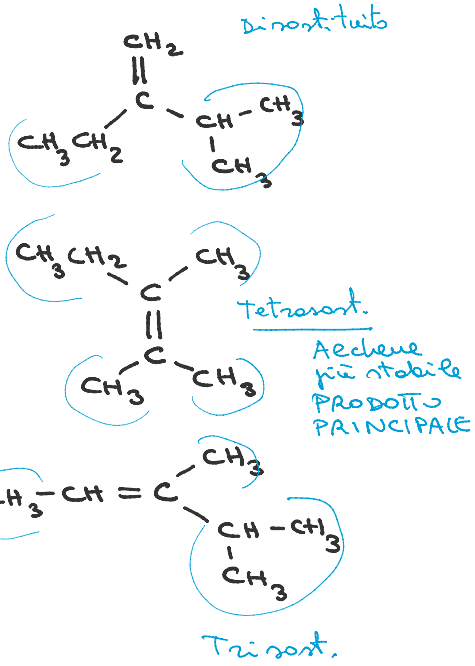
concorrono ed un $\Delta G < 0$

concorrono ed un $\Delta G < 0$
$\Delta H < 0$
$\Delta S > 0$

$$\Delta G = \Delta H - T\Delta S$$

$\Delta S > 0$ se vado verso il disordine

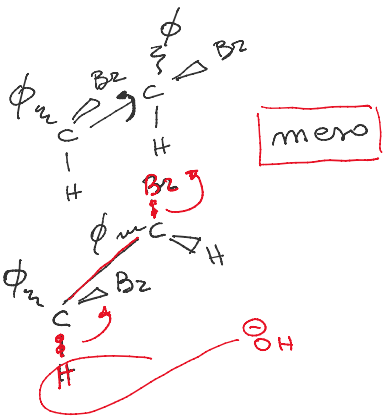


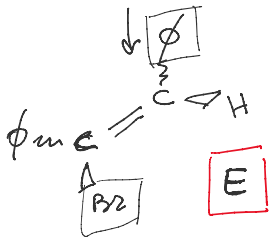


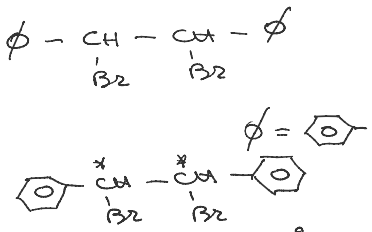
REGIOSELETTIVA

REGOLA DI SAYTZEFF ZAITSEV

STEREOSPECIFICA



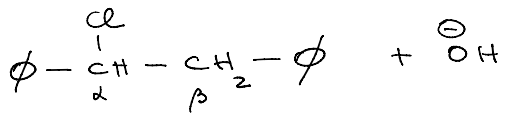


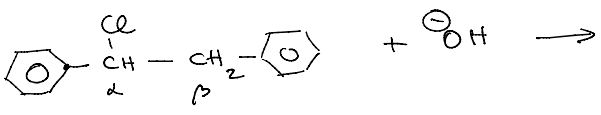


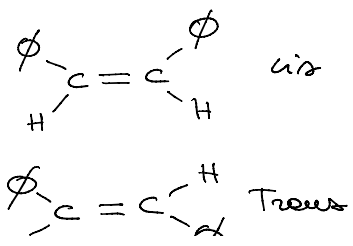
Stereois. conf. meso 3 (1 meso + 1 coppia di enant.)

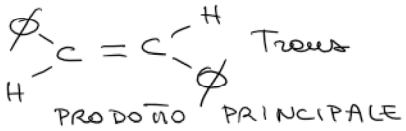
$2^2 = 4$ n° max stereoisom. config.

STEREOSELETTIVA









Una reazione è stereospecifica quando a partire da uno specifico stereoisomero configurazionale come reagente (es: meso) porta ad uno specifico stereoisomero configurazionale come prodotto (es: alchene E)

Una reazione è stereoselettiva quando può fornire come prodotti 2 stereoisomeri configurazionali e uno di questi è il prodotto principale (o esclusivo)

E1 MONOMOLECOLARE BISTADIO

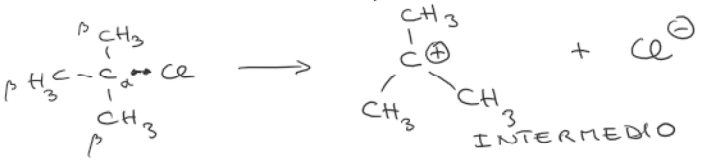
Caratteristiche:

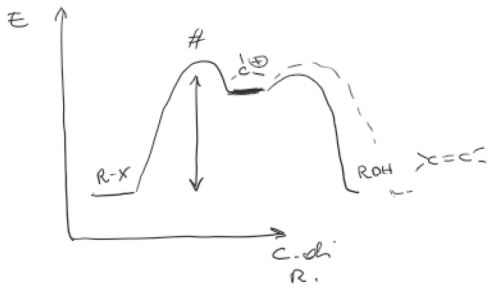
1. Substrato preferito: Terziario
2. Base debole
3. Legge cinetica del 1° ordine
   $v = k[Sub.]$
4. Favorita a T elevate
5. Solventi polari protici (H_2O; ROH)
6. Regioselettiva

in comune con SN1

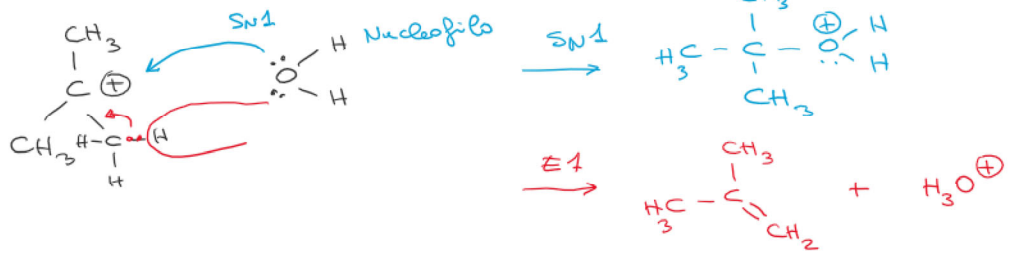
MECCANISMO BISTADIO

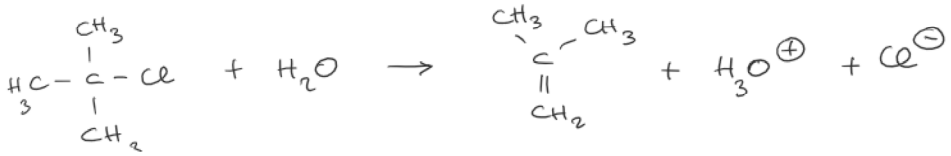
1° STADIO (LENTO)

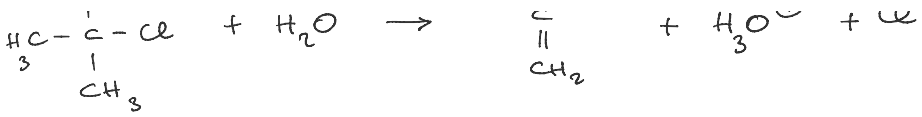


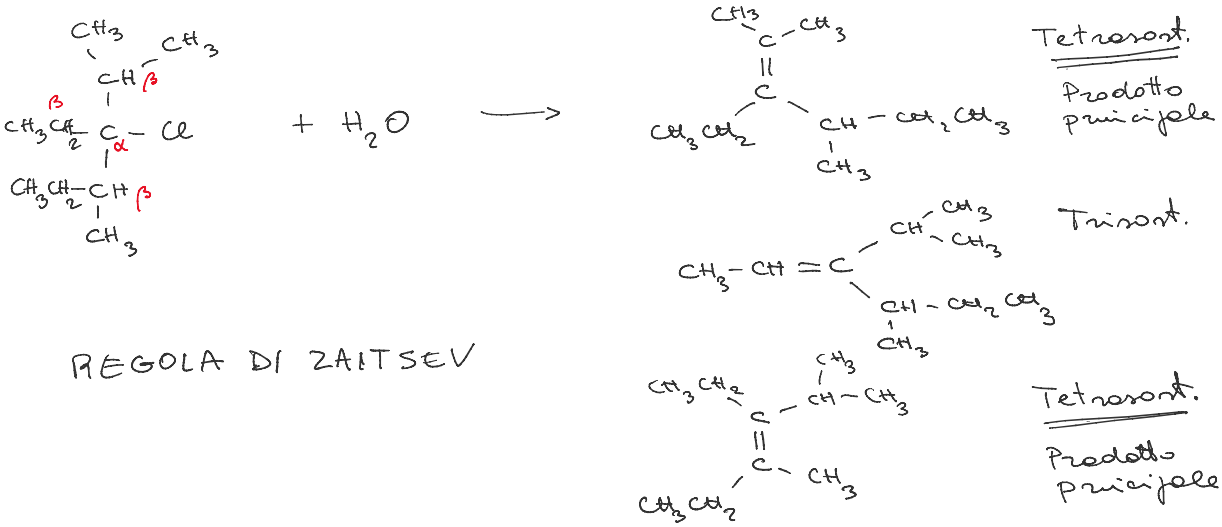


2° STADIO (VELOCE)





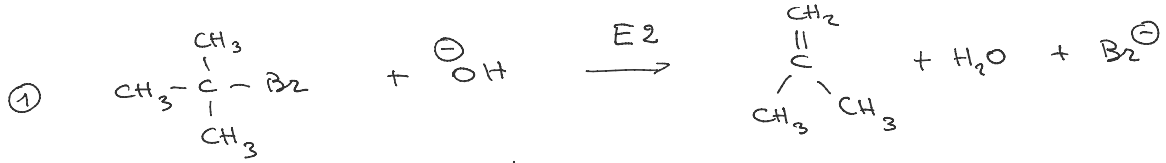


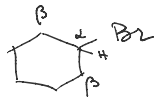
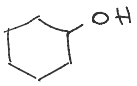


REGOLA DI ZAITSEV

Quale Meccanismo? $S_N1/E1$, S_N2 o E2?

Meccanismo	Substrato	Nu/Base	Solvente	Temp.
S_N2	Primario	Forte	Polare Aprotico (DMF, DMSO)	Bassa
$S_N1/E1$	Terziario	Debole	Polare Protico (H_2O, ROH)	Bassa per S_N1 Alta per E1
E2	Terziario	Forte	Polare Aprotico	Alta



④  + $^{\ominus}OH$ $\xrightarrow{S_N2 \text{ e } E2}$  (S_N2)

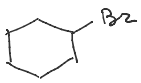
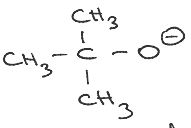
 (E2)

Secondario

Forte

S_N2

E2

⑤  +  $\xrightarrow{E2}$ 

Secondario

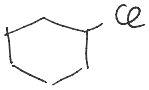
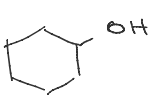
~~$S_N1/E1$~~

E2

~~S_N2~~

Base forte

Nucl. debole

⑥  + H_2O $\xrightarrow{S_N1/E1}$  (S_N1)

 (E1)

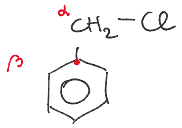
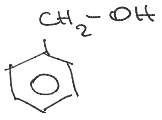
Secondario

$S_N1/E1$

~~E2~~

~~S_N2~~

Debole

 + $^{\ominus}OH$ $\xrightarrow{S_N2}$  + $Cl^{\ominus}$

carbonio β privo di H

Forte

~~E2~~

S_N2