

Corso di Laurea Magistrale in Ingegneria dell'Innovazione del Prodotto
a.a. 2022-23
Anno I – Semestre I

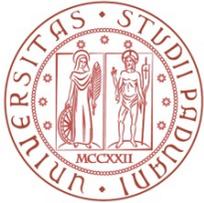


Tecnologia dei materiali polimerici

Lezione 5

Prof. Lisa Biassetto

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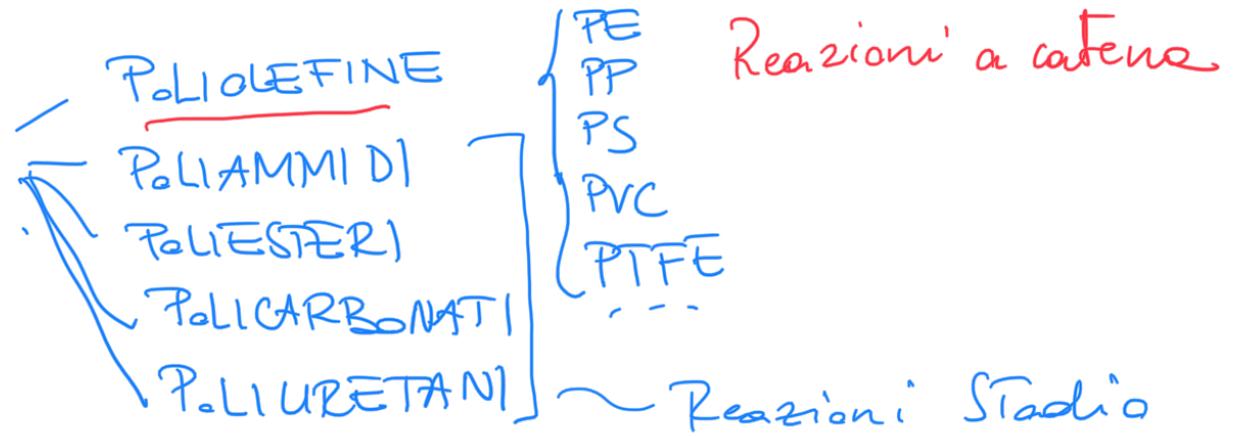


- ❖ Copolimeri
- ❖ Catalizzatori stereospecifici
- ❖ Reazioni a Stadio

POLIMERI CARATTERIZZATI da UNITÀ RIPETITIVE SEMPRE UGUALI



OMOPOLIMERI



COPOLIMERI : Sono POLIMERI CARATTERIZZATI da 2 o PIU' TIPI di UNITÀ RIPETITIVE



COPOLIMERI

① -B-A-B-A-A-A-A-B-B-A-B-B-B-A-B-

STATISTICI

② -A-B-A-B-A-B-A-B-A-B-A-B-A-B-A-

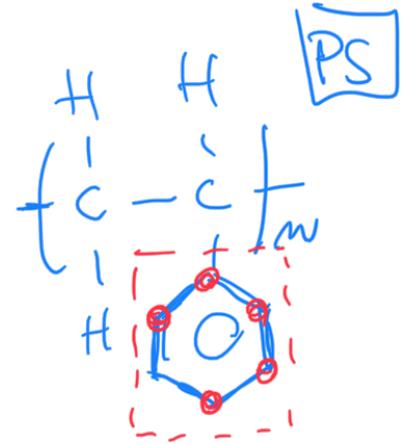
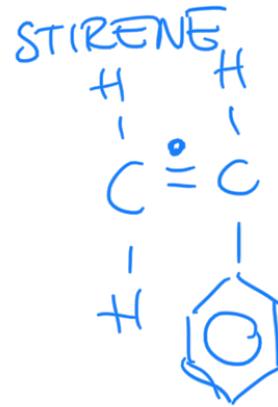
ALTERNATI

③ -A-A-A-A-B-B-A-A-A-B-B-B-B-A-A-

A BLOCCHI

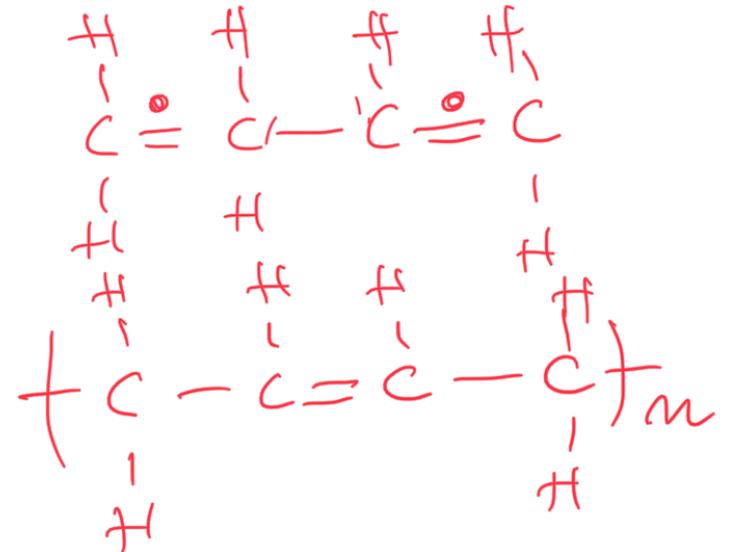
④ -A-A-A-A-A-A-A-A-A-A-A-A-A-A-A-
B
B
B
B
B
B
B
B

A BLOCCHI
RAMIFICATI



ALTA T_g
ELEVATA RIGIDITA'

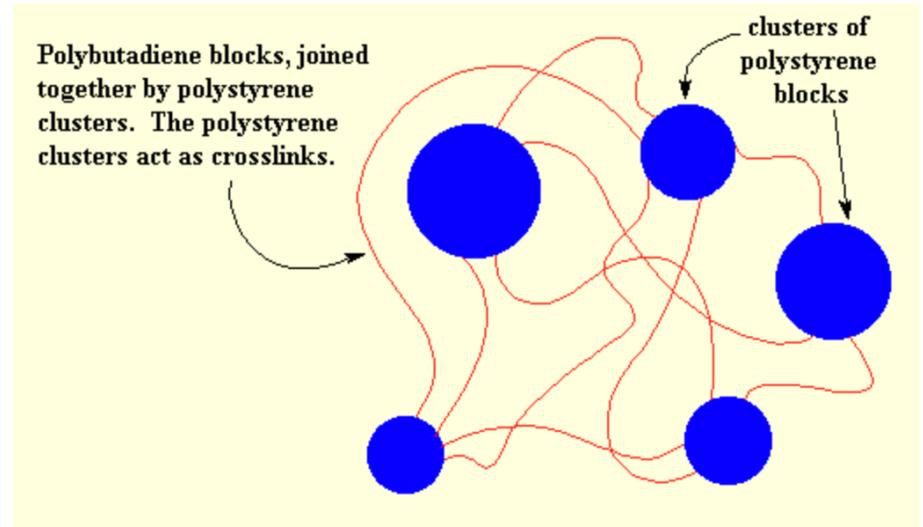
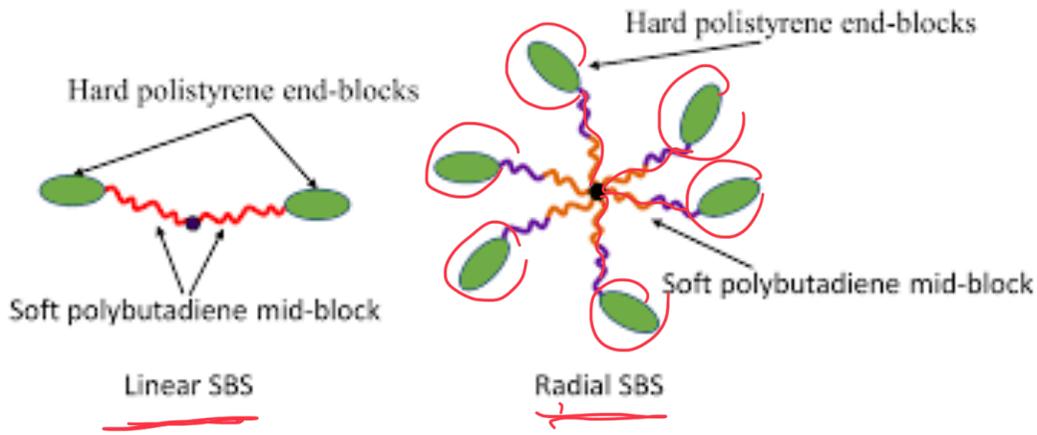
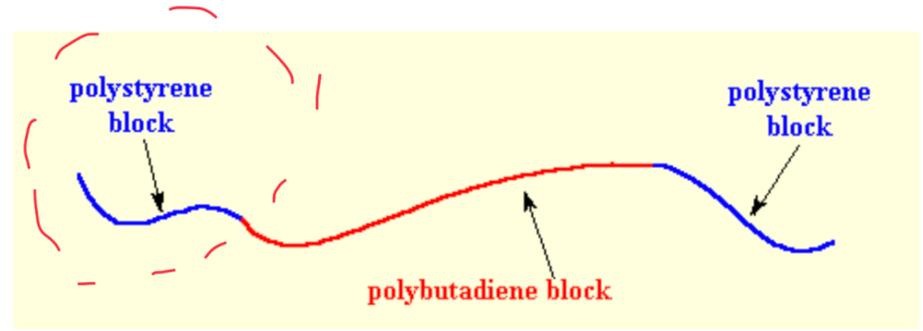
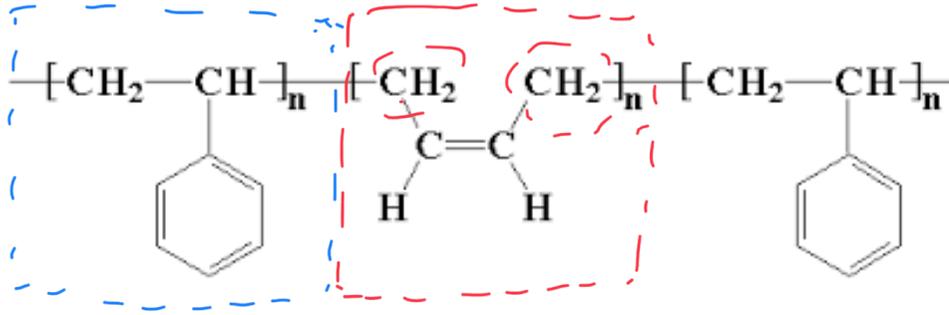
BUTADIENE



COPOLIMERI

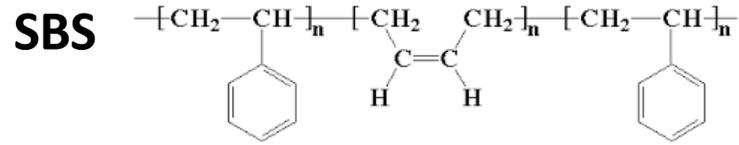
ELASTOMERI TERMOPLASTICI (TPE)

SBS



COPOLIMERI

ELASTOMERI TERMOPLASTICI (TPE)



Esempi di prodotti realizzati in SBS



Granulo

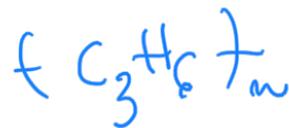
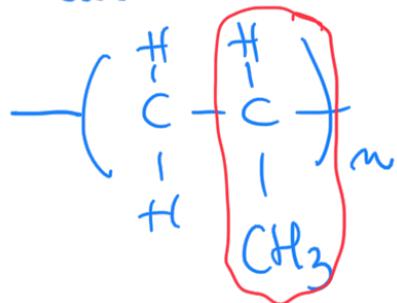


CATALIZZATORI STEREOSPECIFICI: MACROMOLECOLE LINEARI, CONTROLLO STEREOCHIMICO

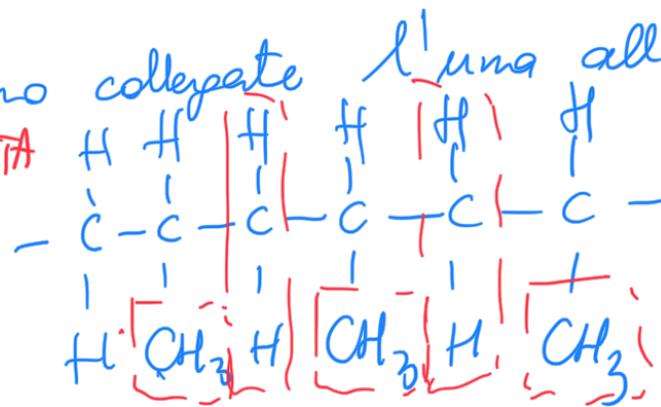
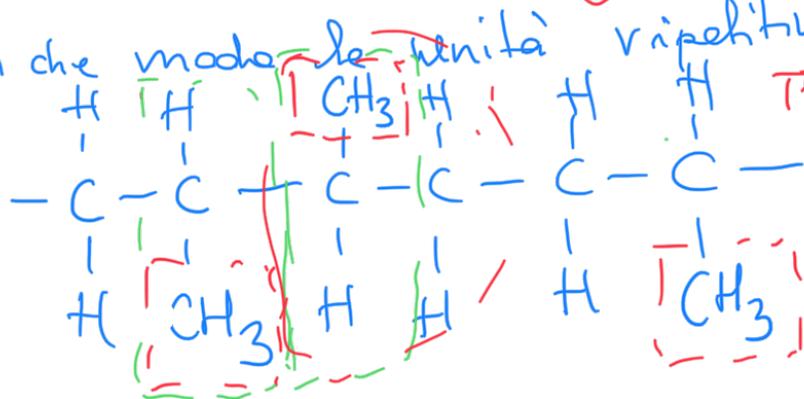
1. COMPOSIZIONE
2. COSTITUZIONE
3. CONFIGURAZIONE
4. CONFORMAZIONE

1. Gli atomi di cui è costituita l'unità ripetitiva

es. PP



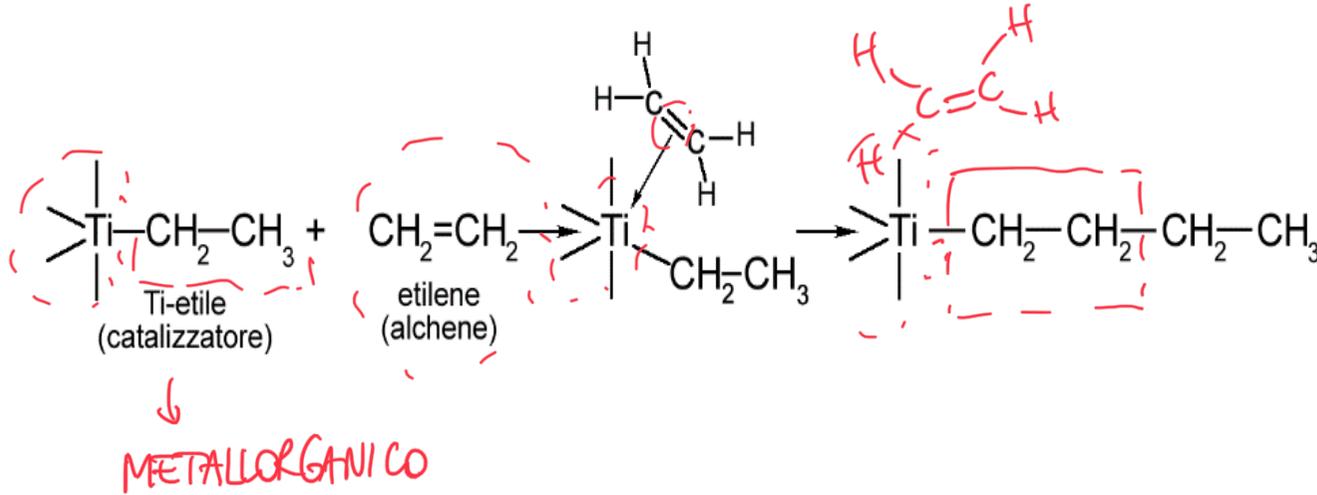
2. In che modo le unità ripetitive sono collegate l'una all'altra



Ziegler-Natta
Premio Nobel

→ POLIMERIZZAZIONE STEREOSPECIFICA (A CATENA) | Se
1965

Ti-Etile, esempio di catalizzatore stereospecifico



STRUTTURA LINEARE ⇒ PRIVA di RAMIFICAZIONI ⇒ HDPE

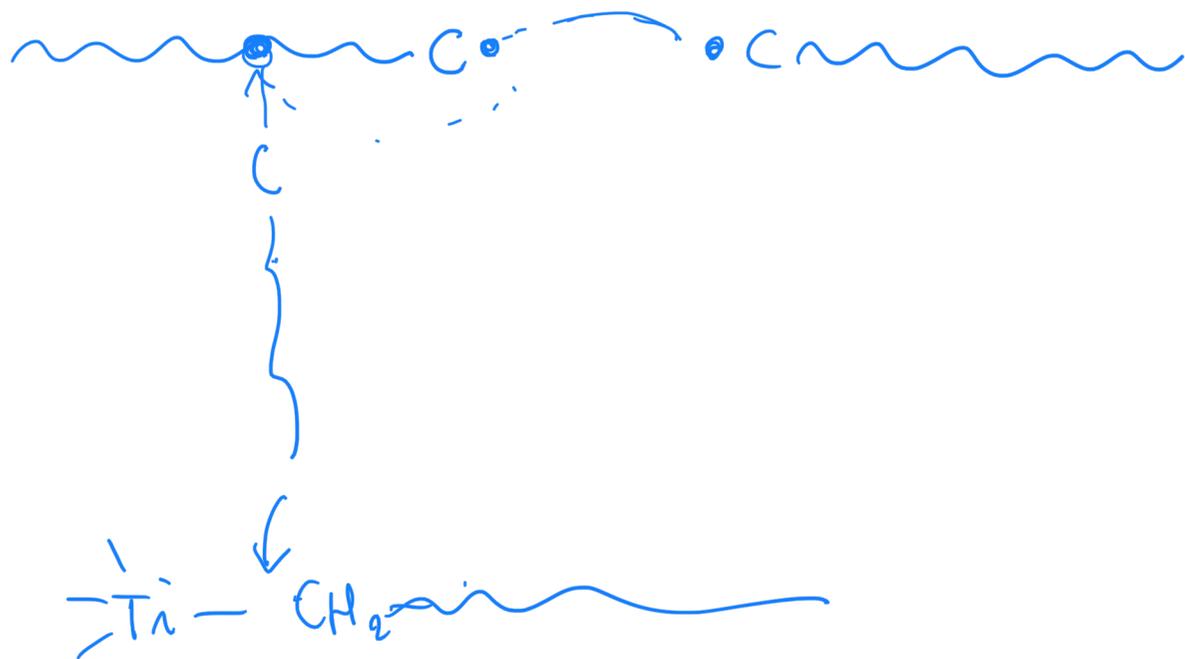
LDPE (Polietilene a bassa densità) ⇒ PRESENTA RAMIFICAZIONI

Con lo stesso principio posso guidare la polimerizzazione
di monomeri con STRUTTURA ASIMMETRICA

PP - ISOTATTICO

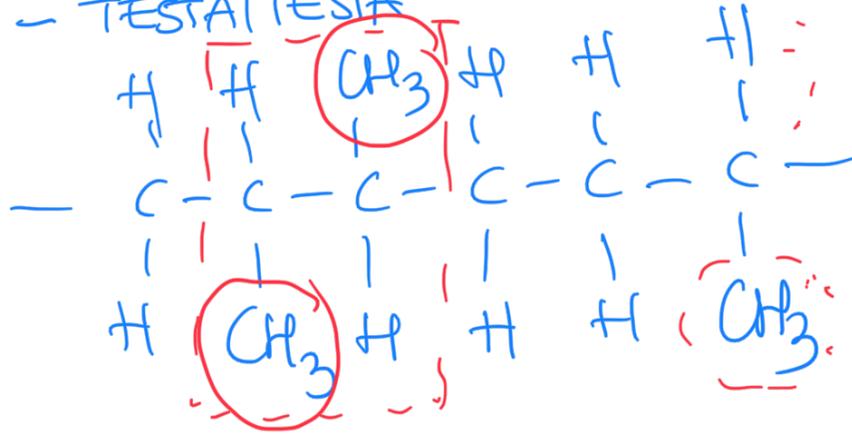
PP - SINDIOTATTICO

Reazioni a catena

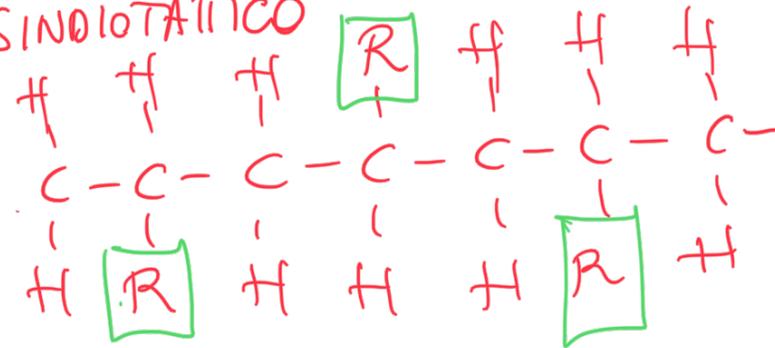


3. CONFIGURAZIONE

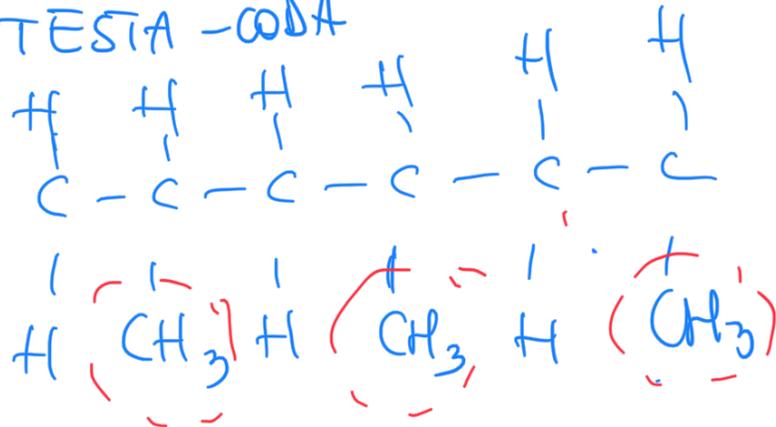
PP - TESTA/TESTA



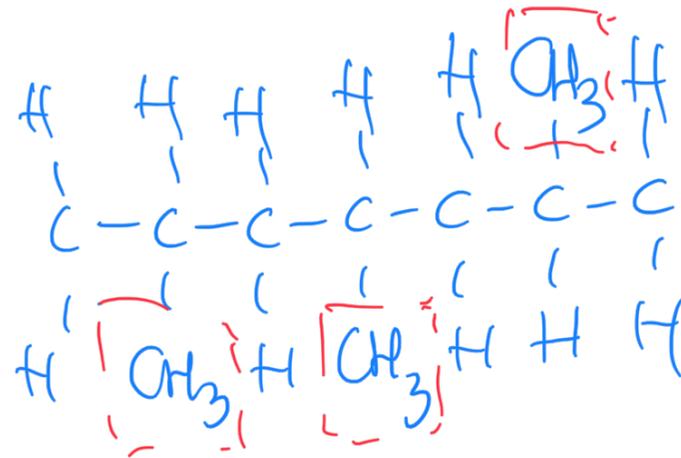
SINDIOTATTICO



PP TESTA-CODA

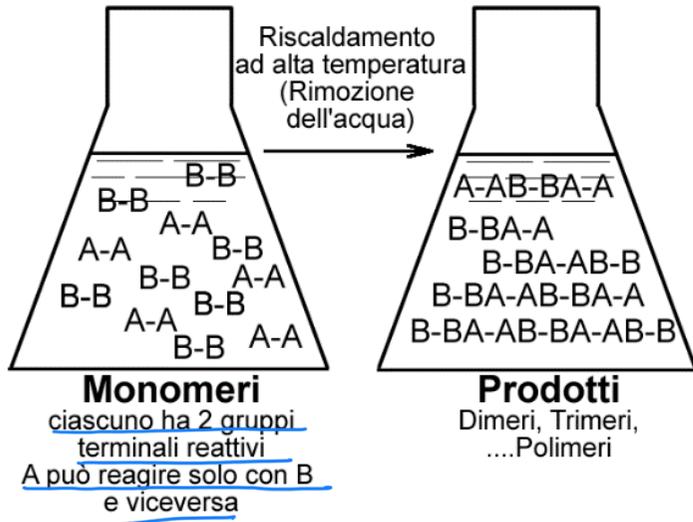


ISOTATTICA

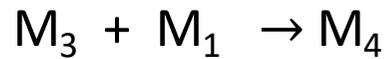
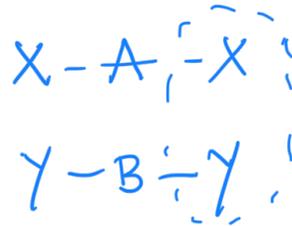


ATATTICA

REAZIONI A STADIO →



Reazioni a catene



REAZIONI A STADIO

1) Sintesi delle Poliammidi

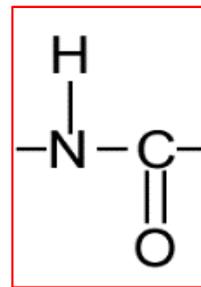
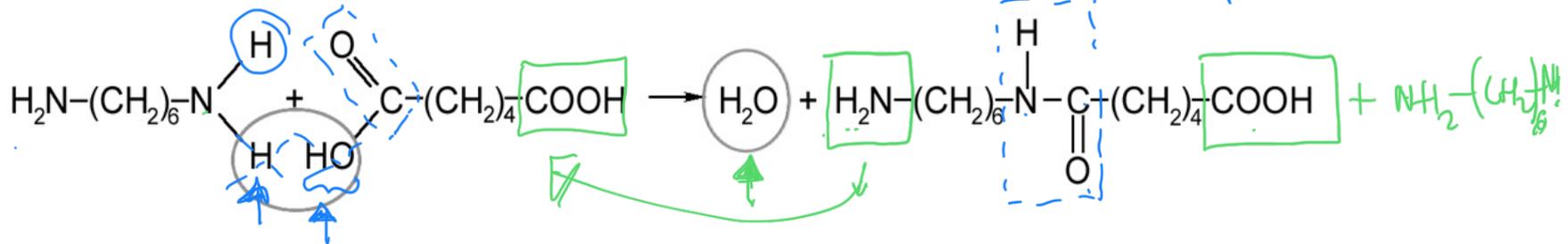
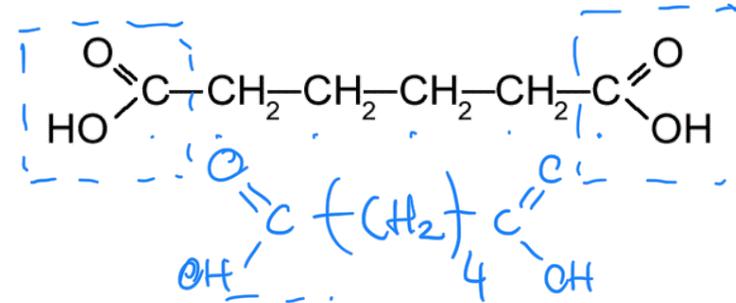
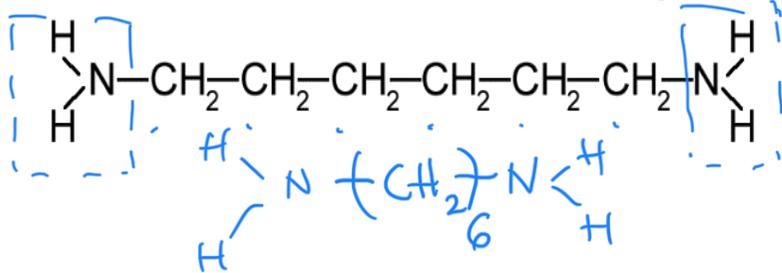
ESAMETILEN DIAMMINA

A

+

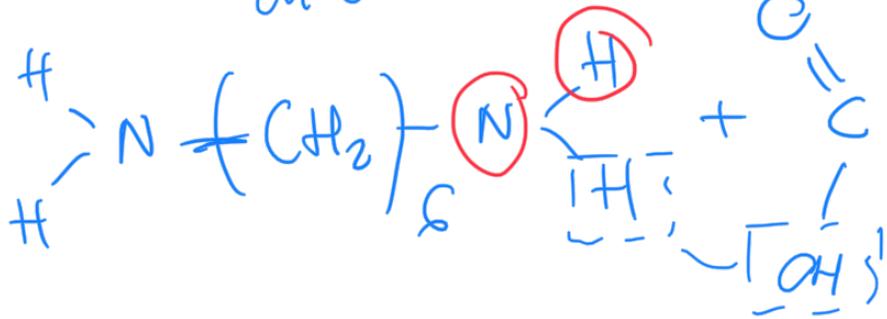
B

ACIDO CARBOSSILICO

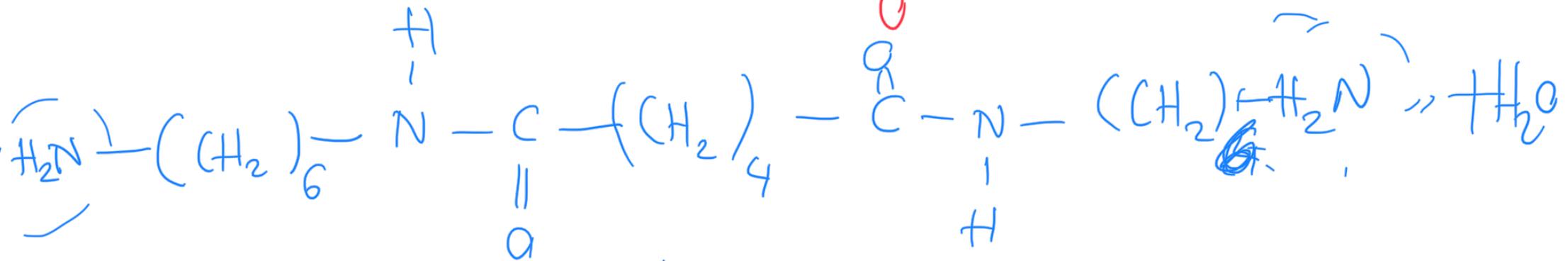
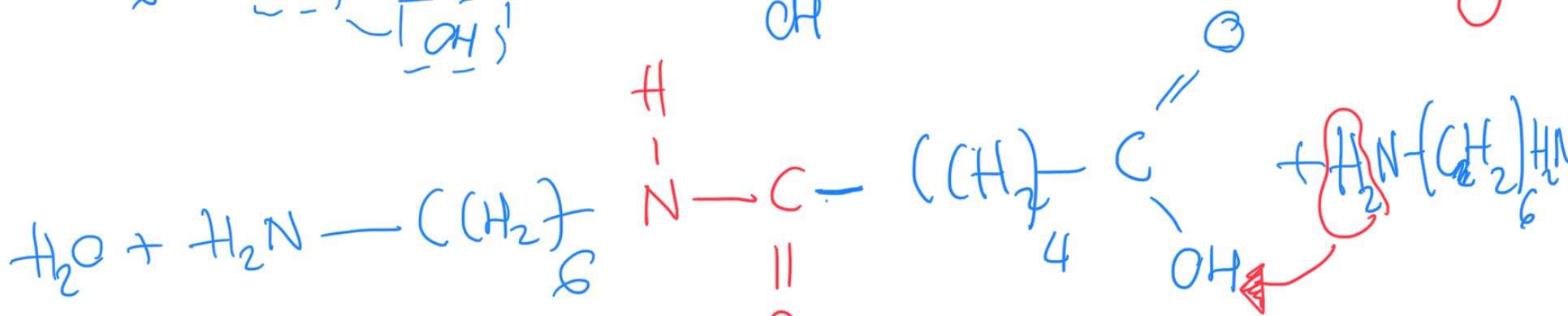
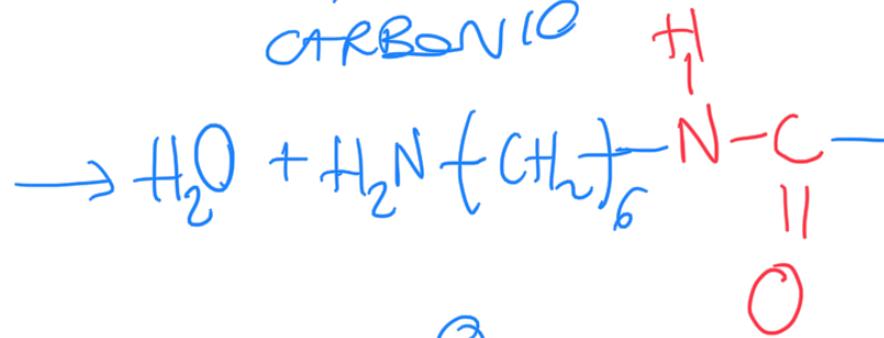


→ GRUPPO AMMIDICO

6 ATOMI
di CARBONIO



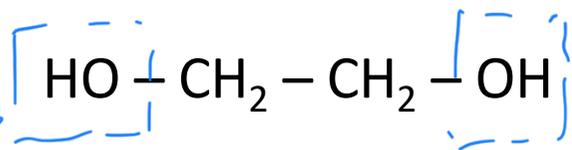
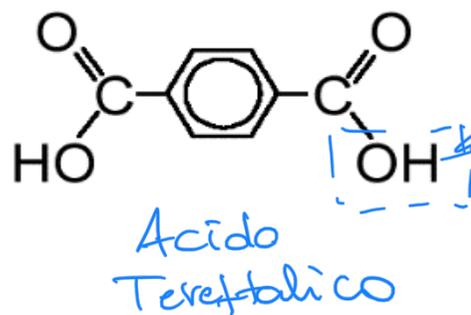
6 ATOMI di
CARBONIO



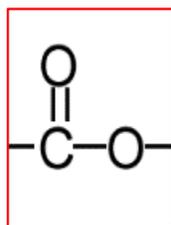
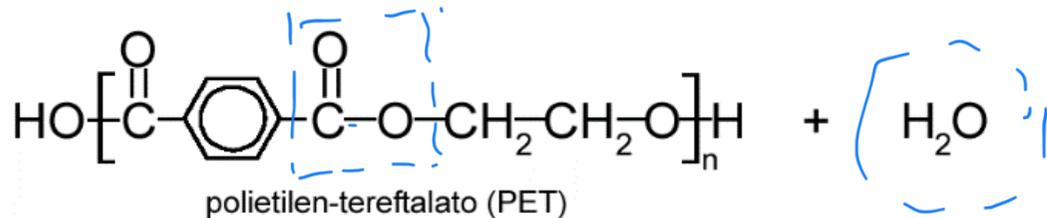
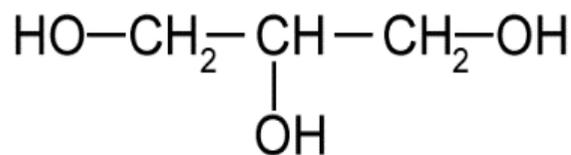
Nylon 6,6

2) Sintesi del PET

POLIESTERI
↳ PoliEtilen Tereftalato

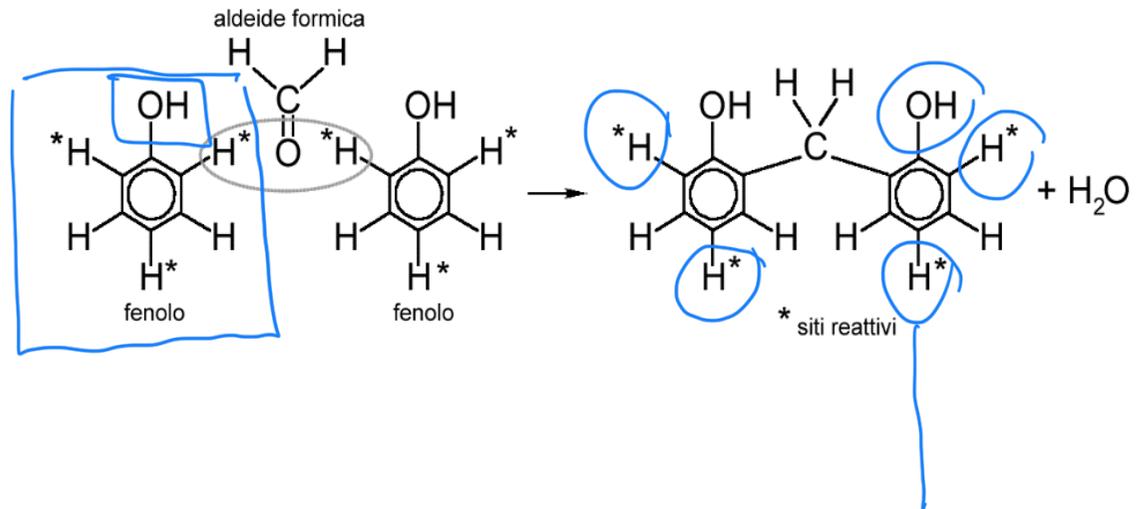
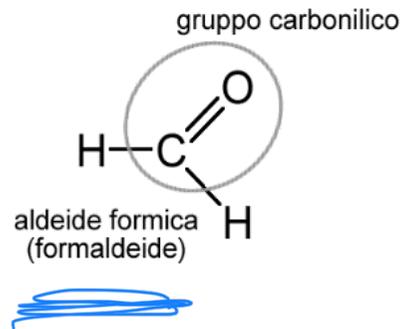


Reazione di
Condensazione



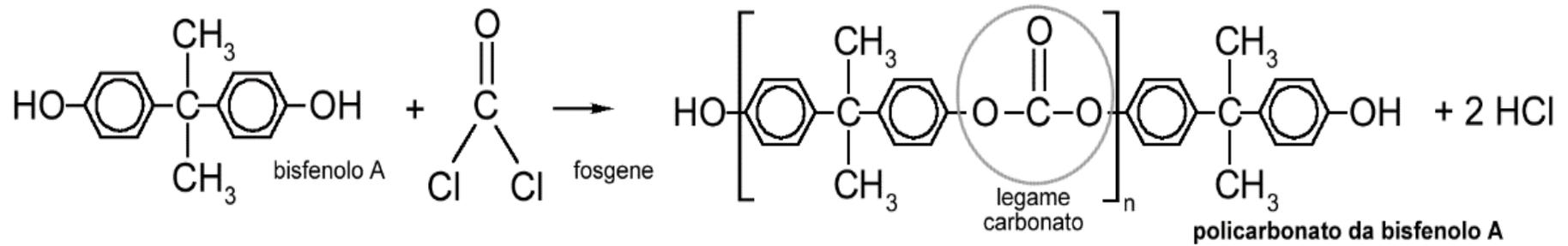
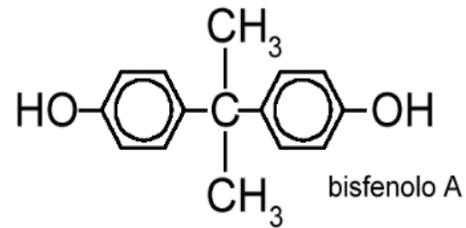
→ ESTERI

3) Resine fenoliche

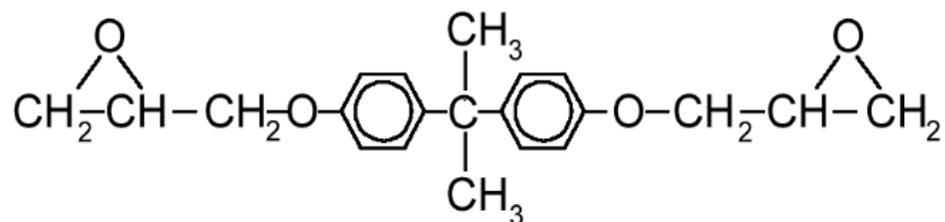
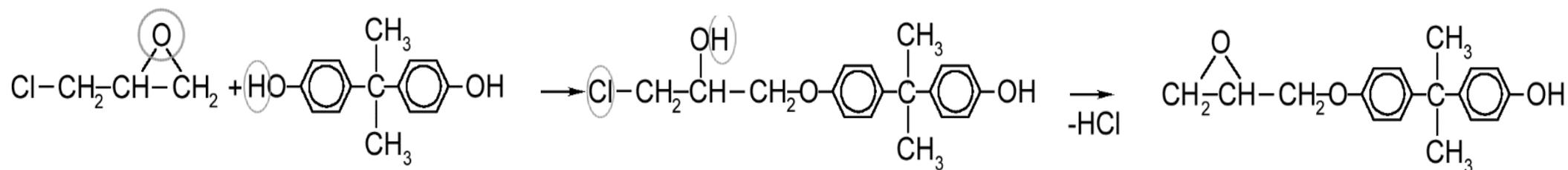
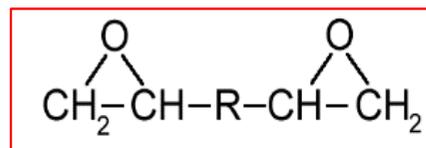
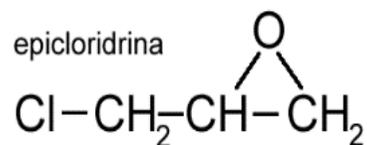


Stadio	Denominazione	Struttura	Caratteristiche
(A)	Resolo	Lineare o poco ramificata	Solubile e fusibile
(B)	Resitolo	Ramificata e poco reticolata	Insolubile e fusibile
(C)	Resite	Totalmente reticolata	Insolubile e infusibile

4) Policarbonato

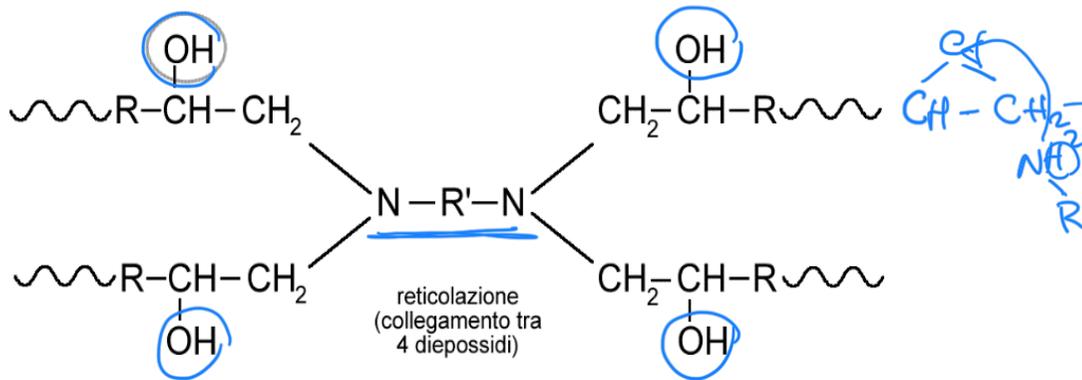
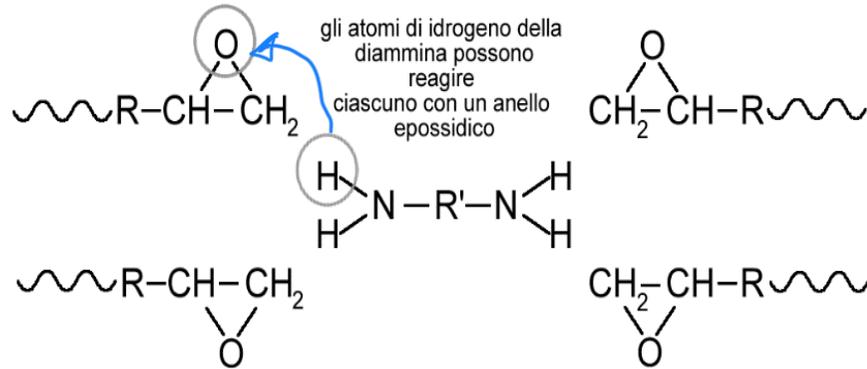
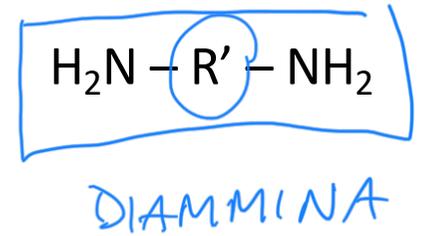
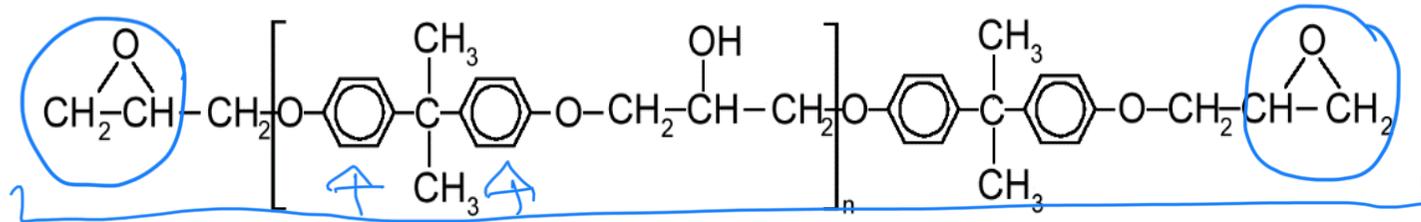


5) Resina epossidica



5) Resina epossidica

ANELLI EPOSSIDICI



5) Resine poliestere insature

