

Welcome to 3.091

Lecture 28

November 18, 2009

Polymers: Structure & Composition



3.091 Test #3
“celebration part 3”
Monday, November 23, 2009



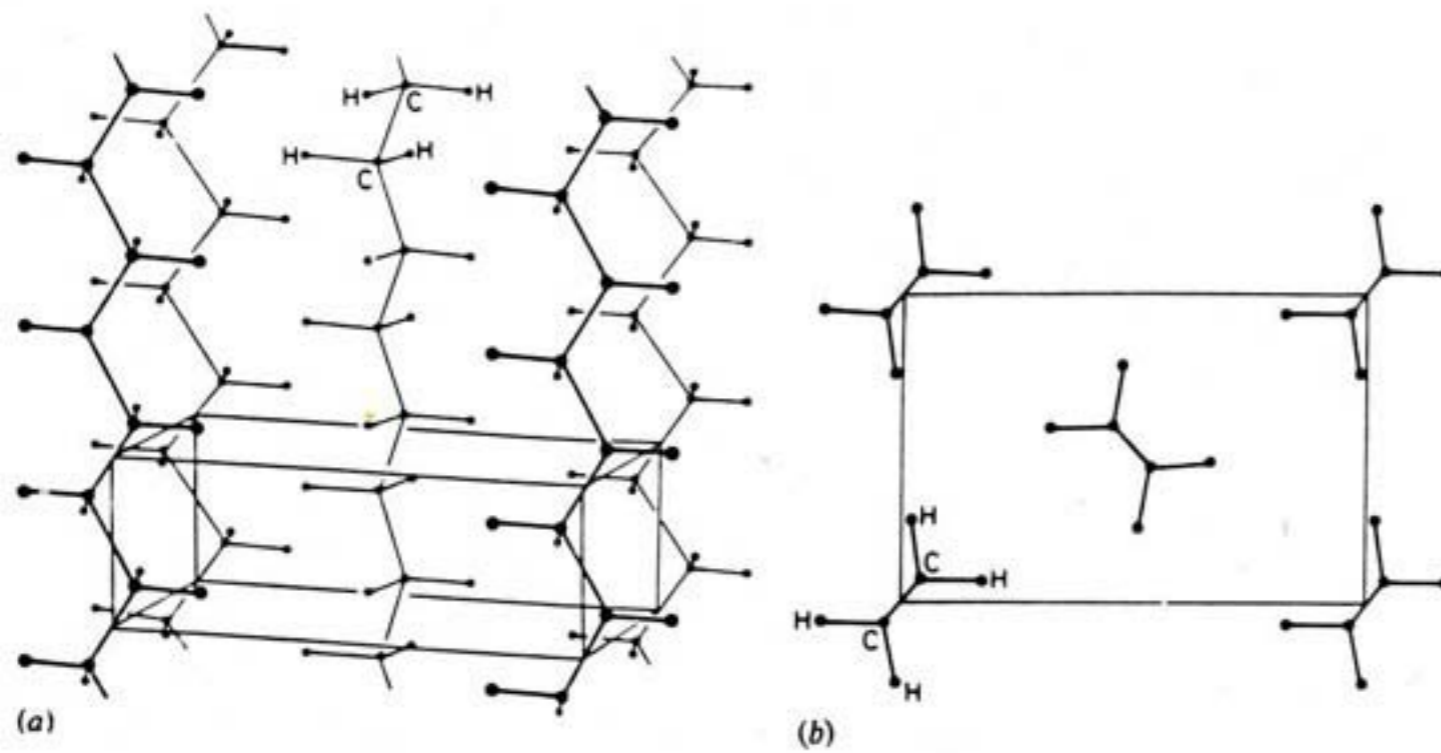
Makeup test December 2 during class

Polythene Pam

(Lennon/McCartney)

Lyrics removed due to copyright restrictions.

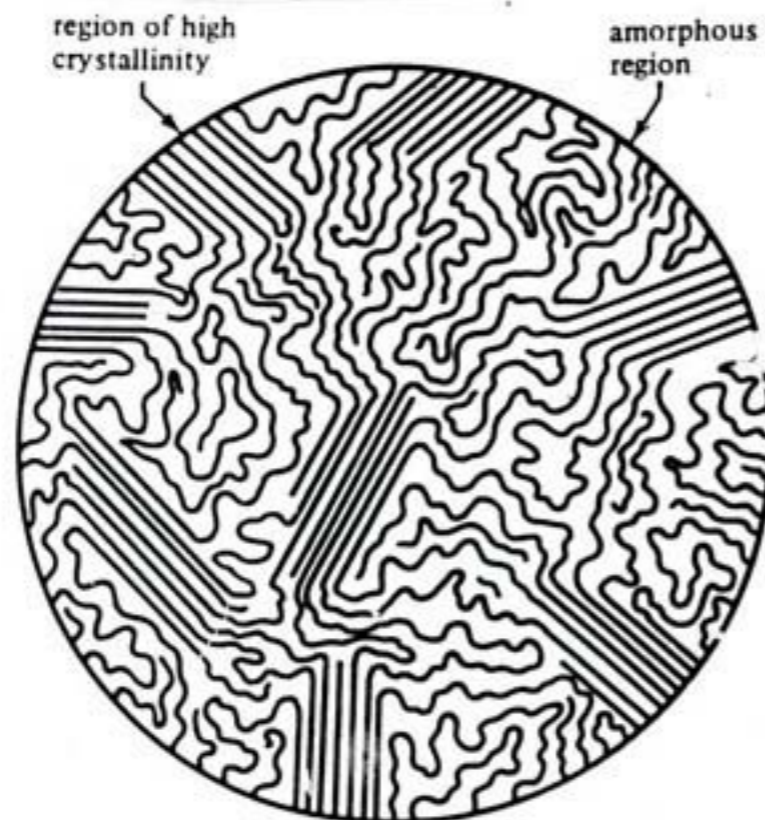
"Polythene Pam." The Beatles. *Abbey Road* (1969).



Crystalline polyethylene: orthorhombic

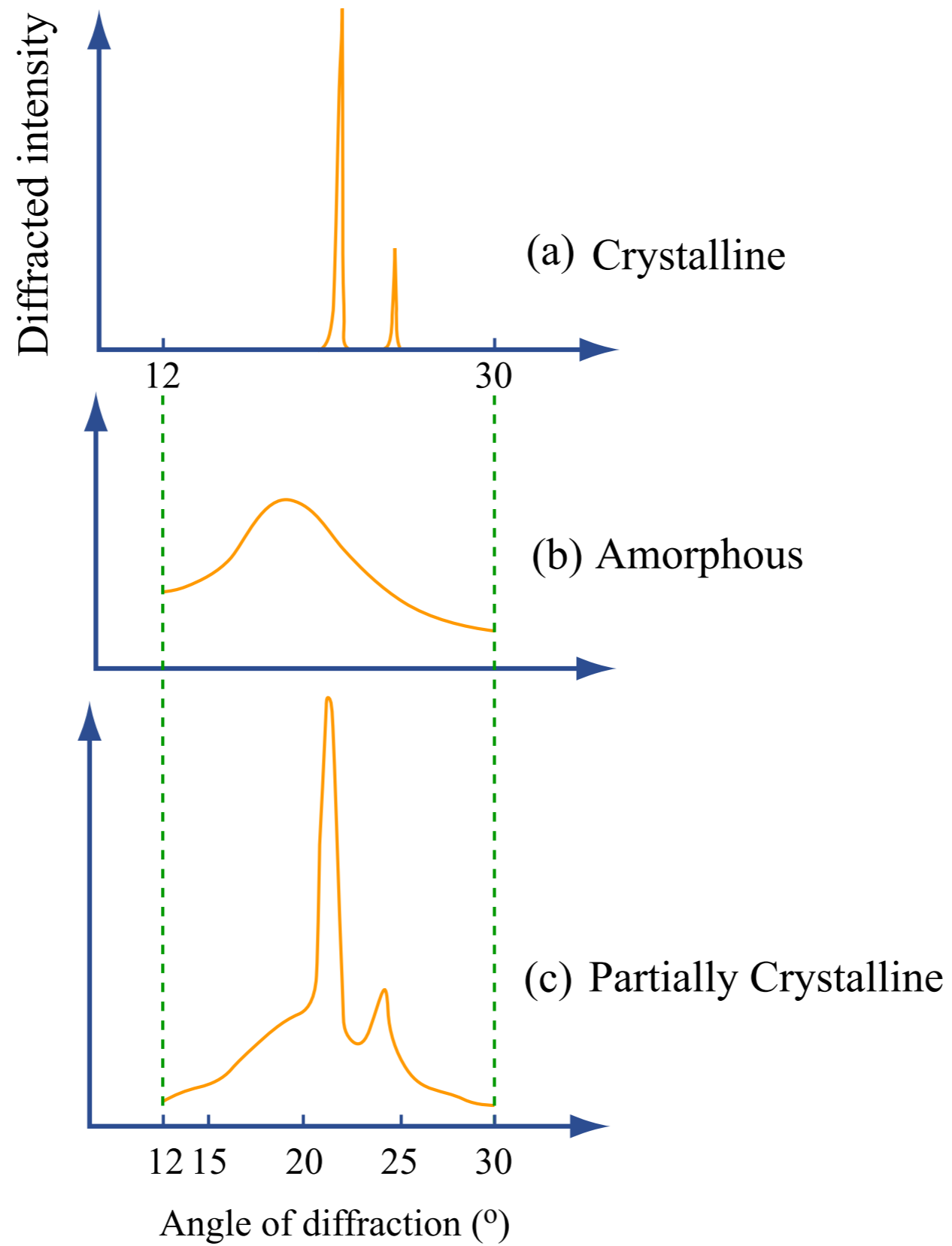
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Partially
 crystallized
 polyethylene

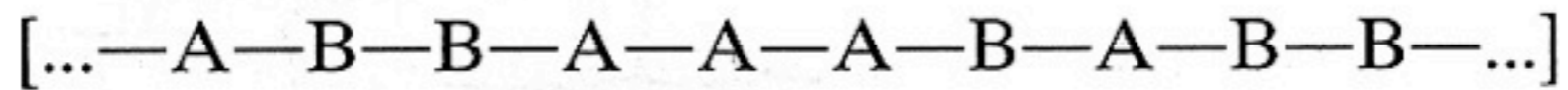


Source: Hayden, H. W., W. G. Moffatt, and J. Wulff.
The Structure and Properties of Materials; Vol. III, Mechanical Behavior. John Wiley and Sons, Inc., 1965.

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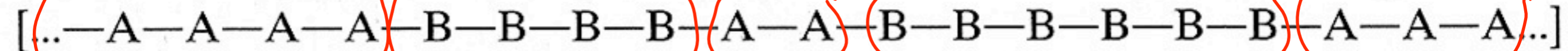
Polyethylene



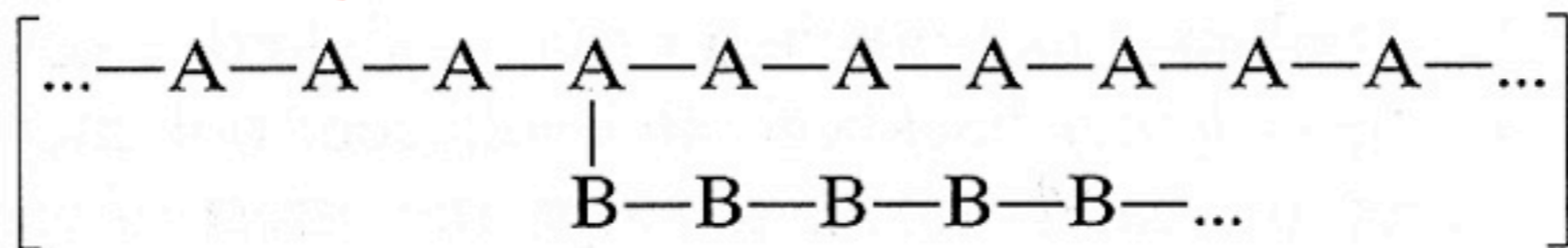
Random copolymer



Regular copolymer (Alternating copolymer)



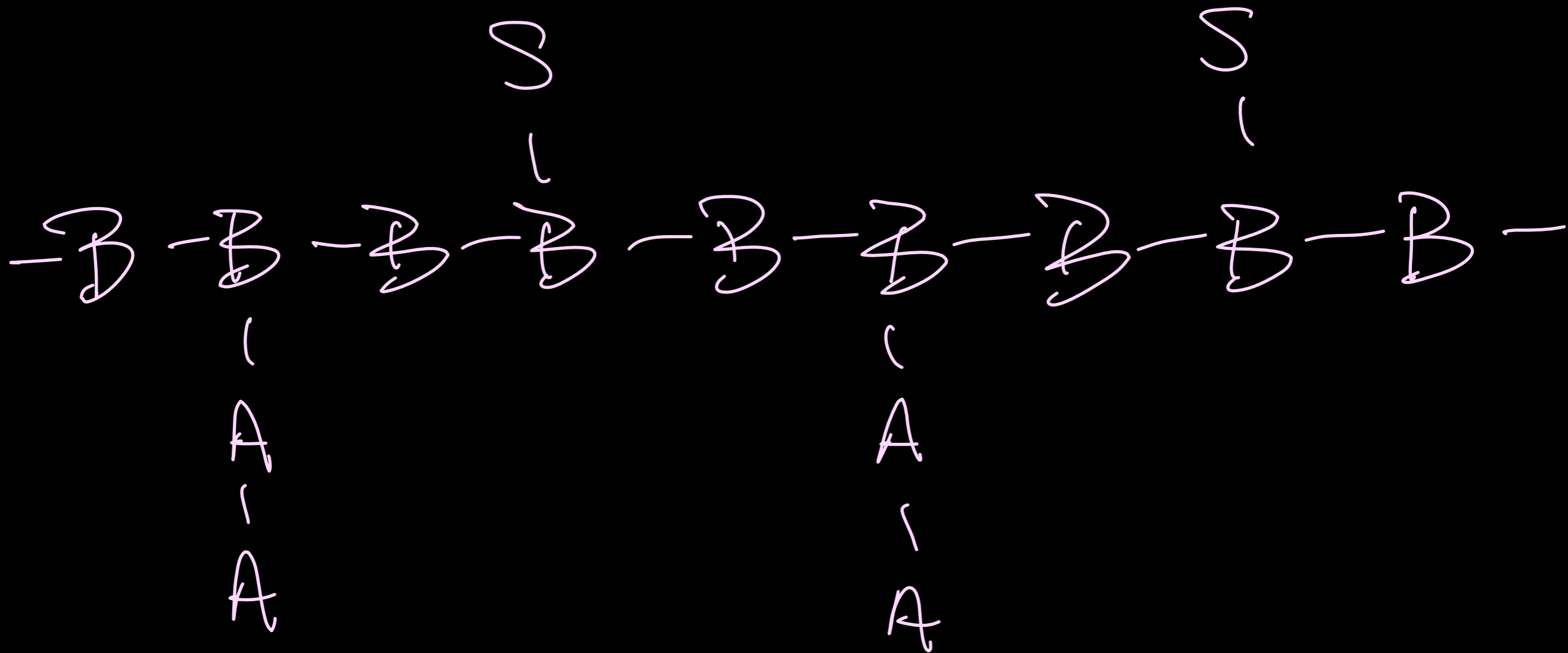
Block copolymer



Graft copolymer

ABS

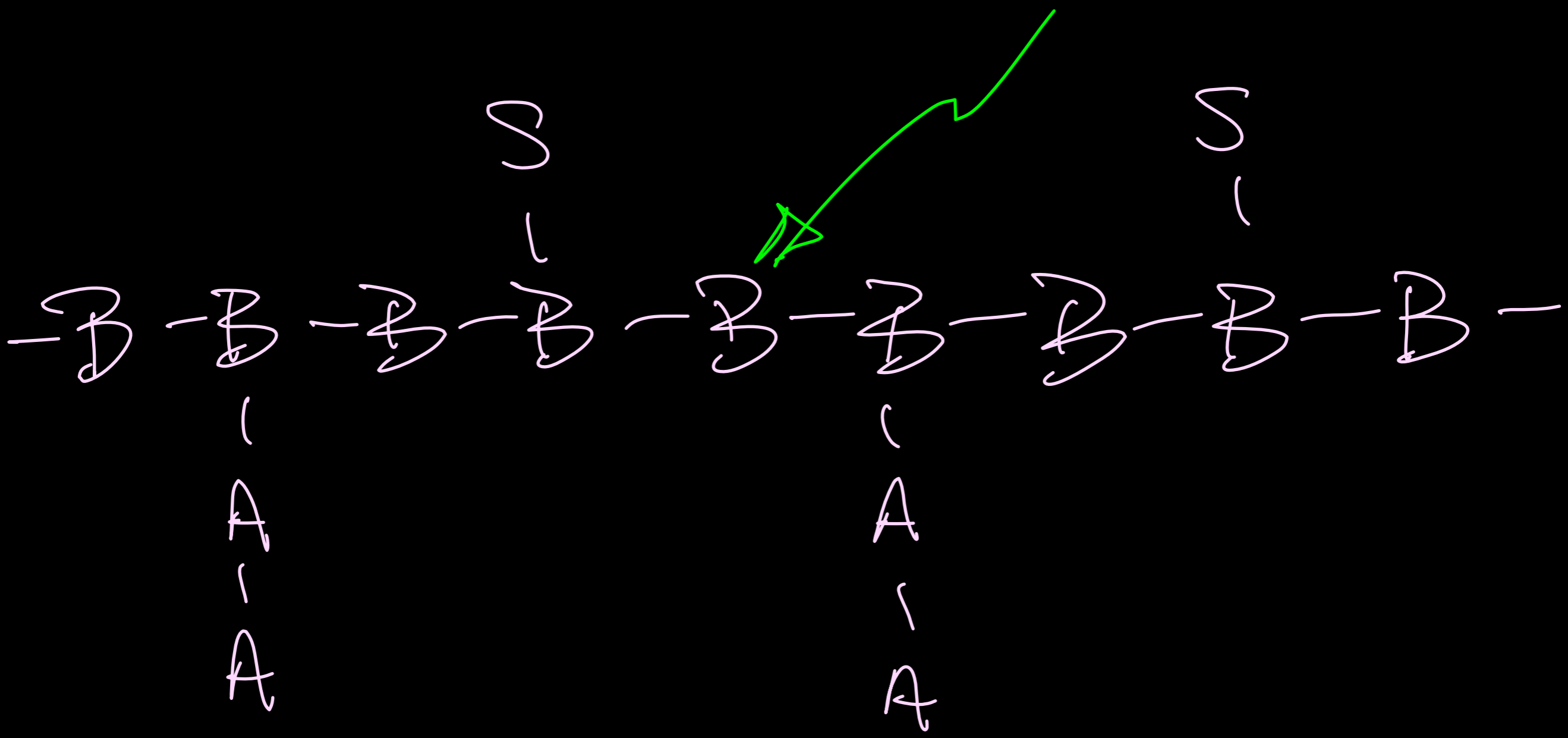
acrylonitrile-butadiene-styrene



graft Copolymer

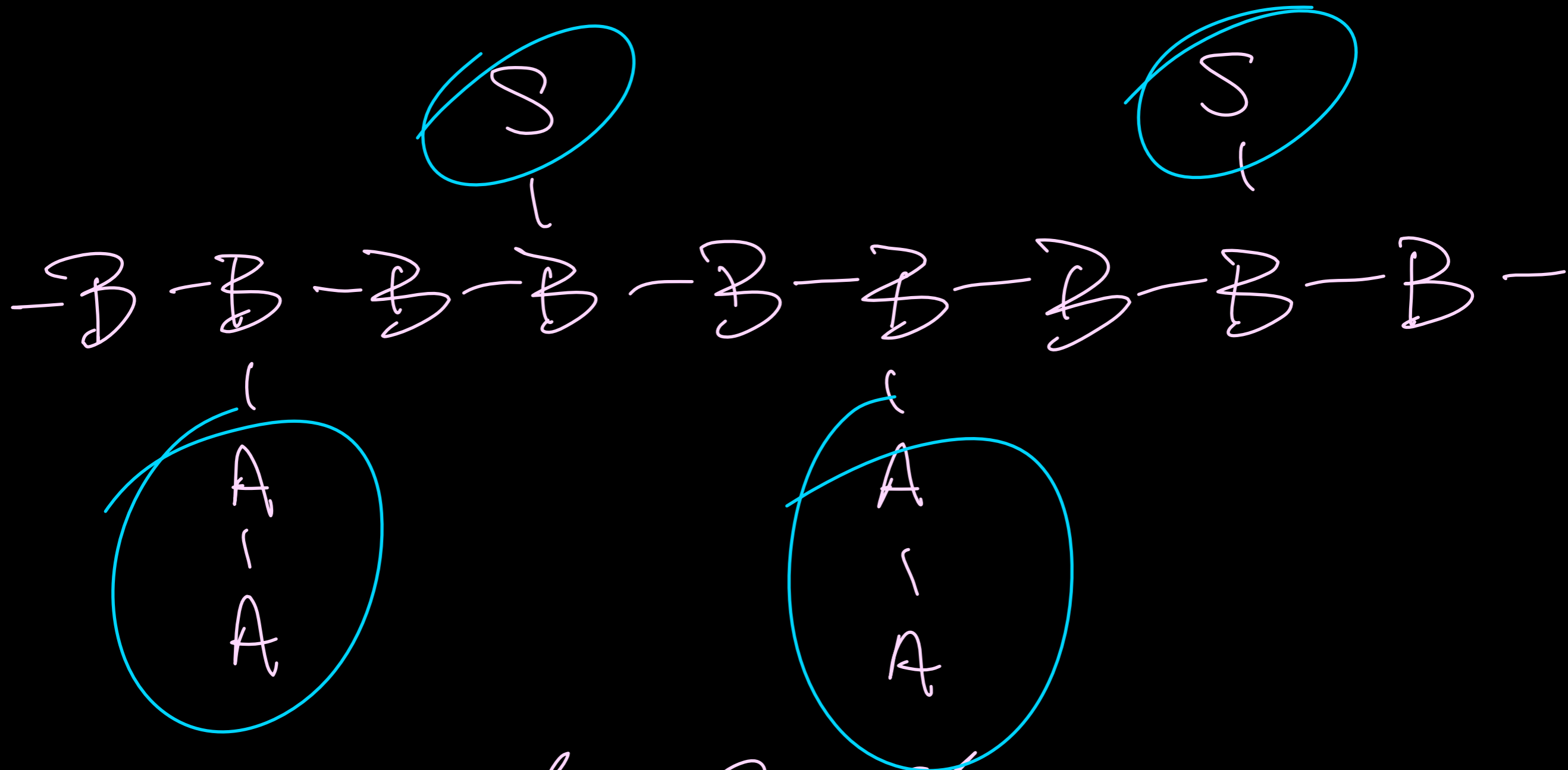
ABS

acrylonitrile-butadiene-styrene
backbone

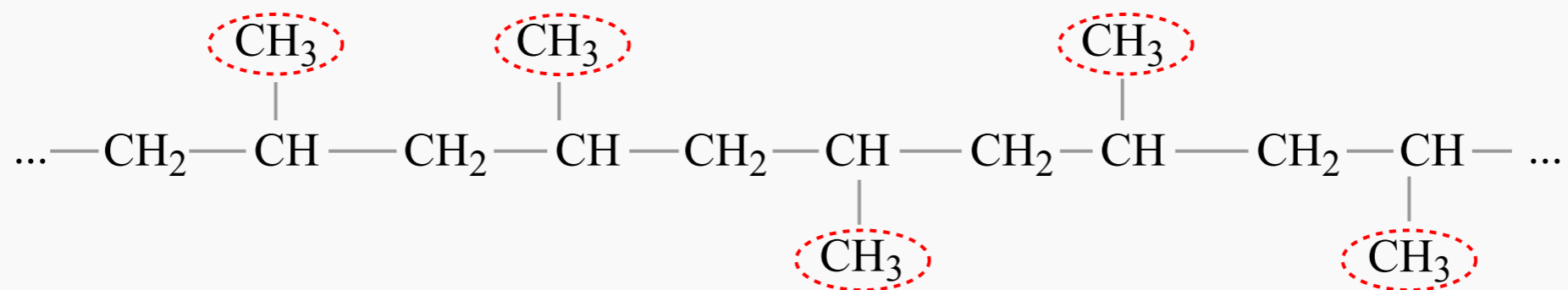


graft Copolymer

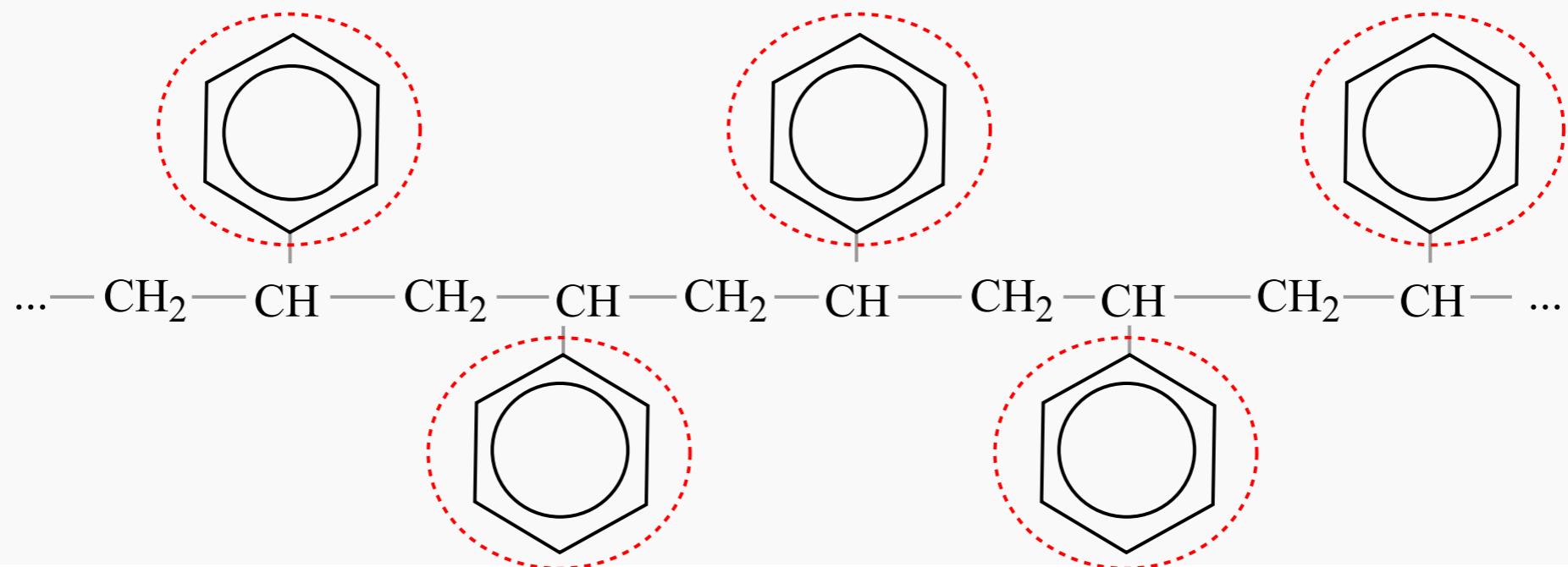
ABS acrylonitrile-butadiene-styrene
sidechains sidechains



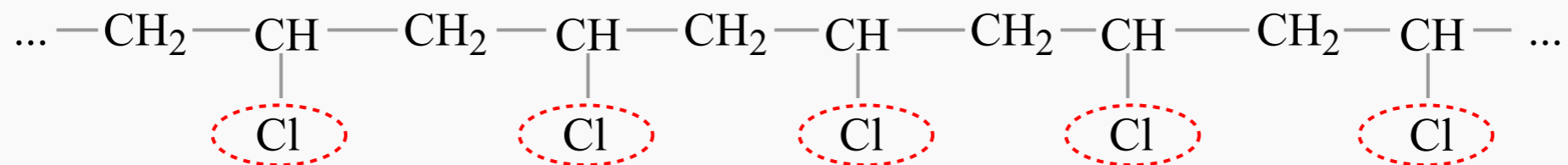
graft Copolymer



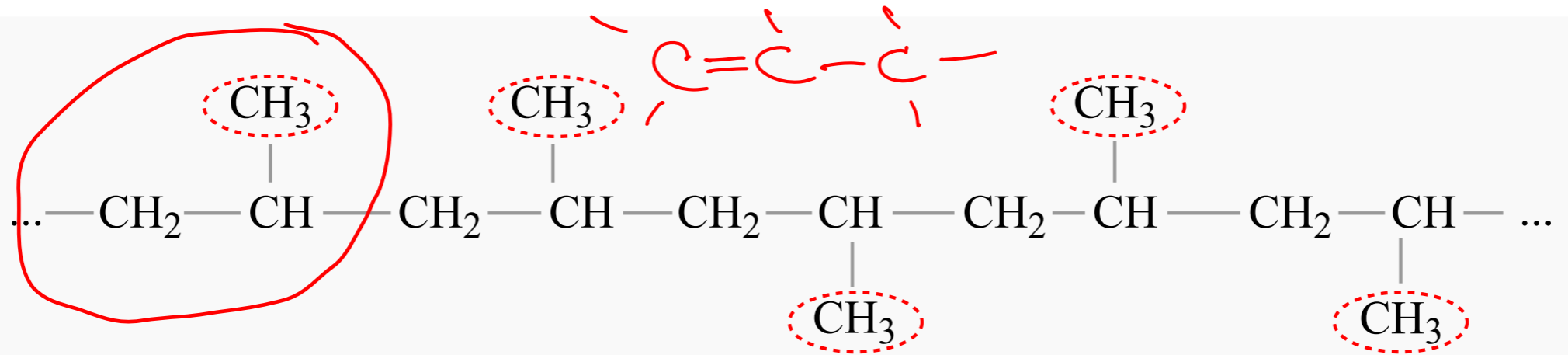
Atactic Polypropylene



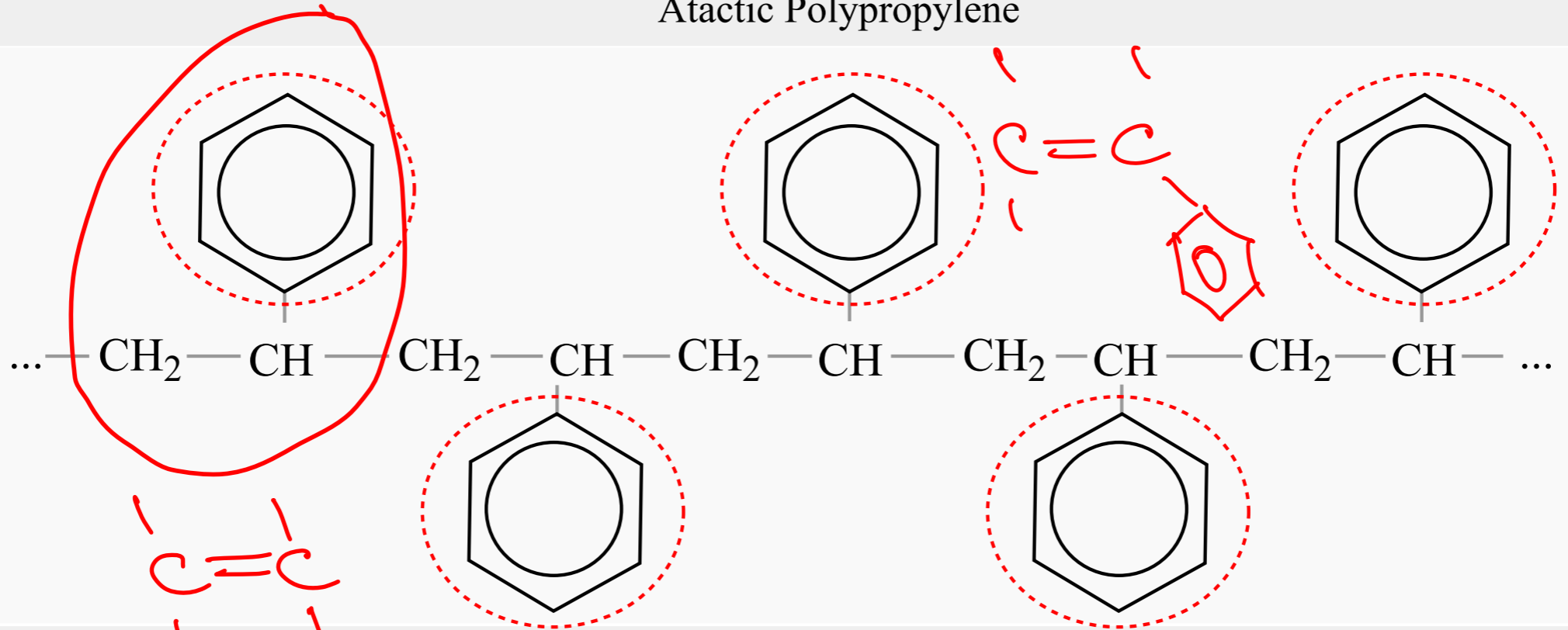
Syndiotactic Polystyrene



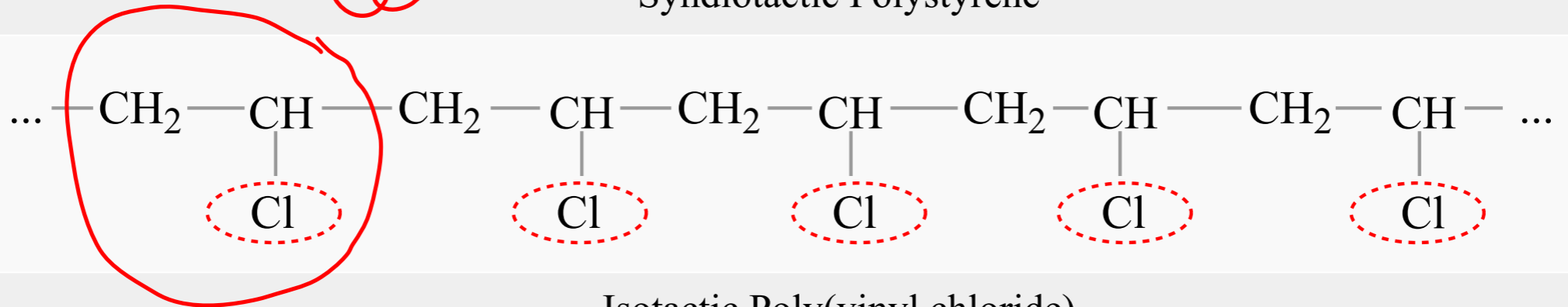
Isotactic Poly(vinyl chloride)



Atactic Polypropylene

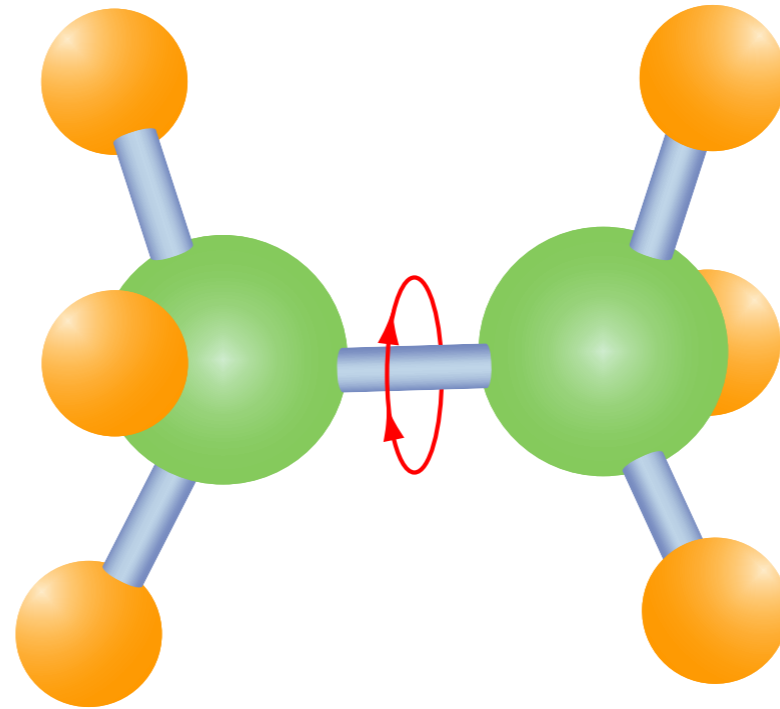


Syndiotactic Polystyrene

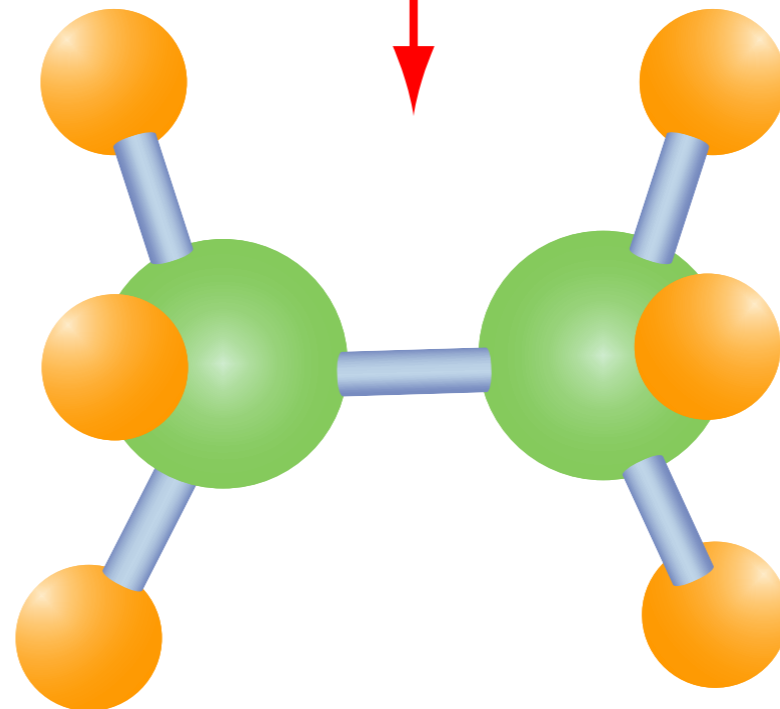


Isotactic Poly(vinyl chloride)

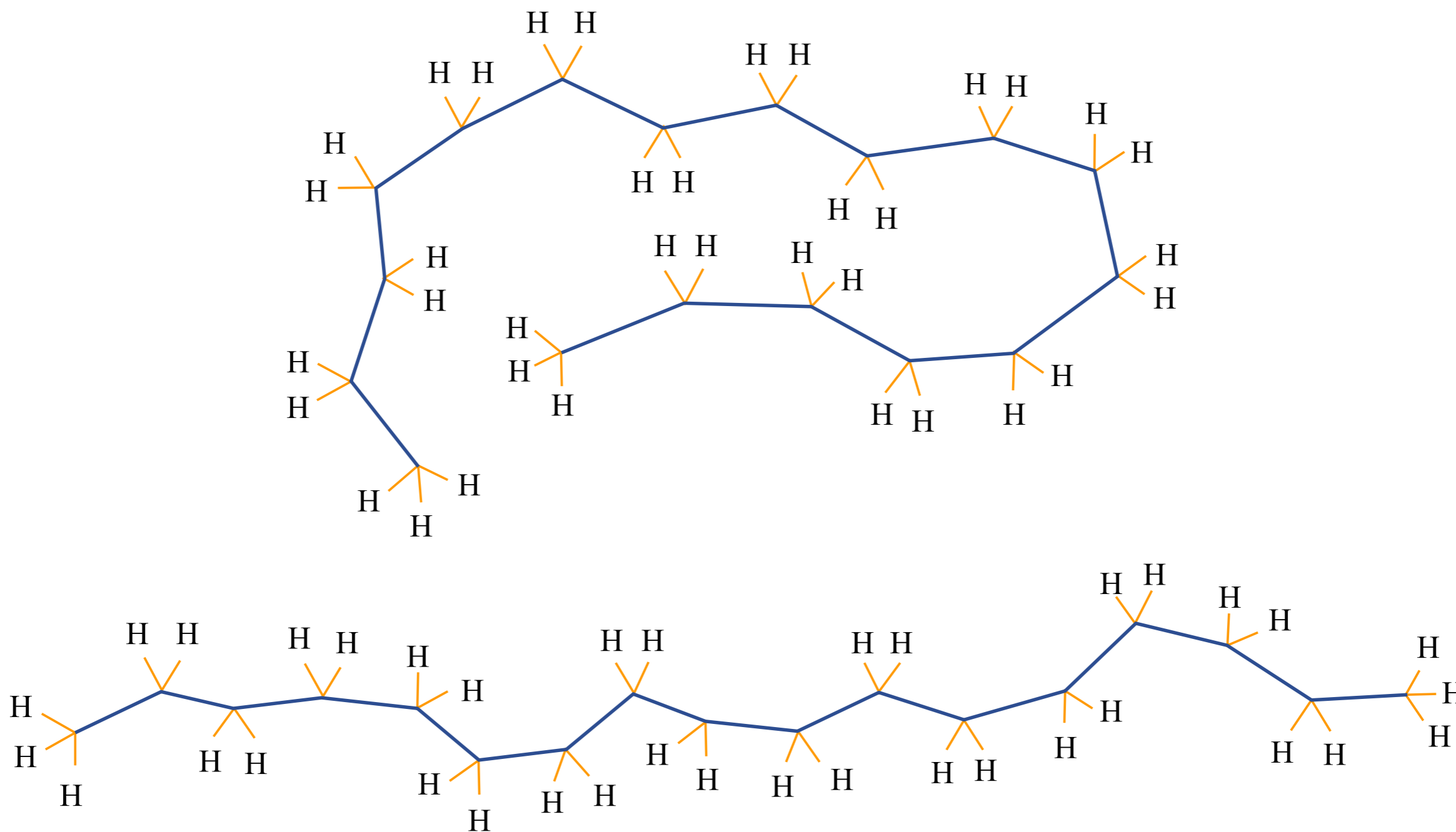
Staggered

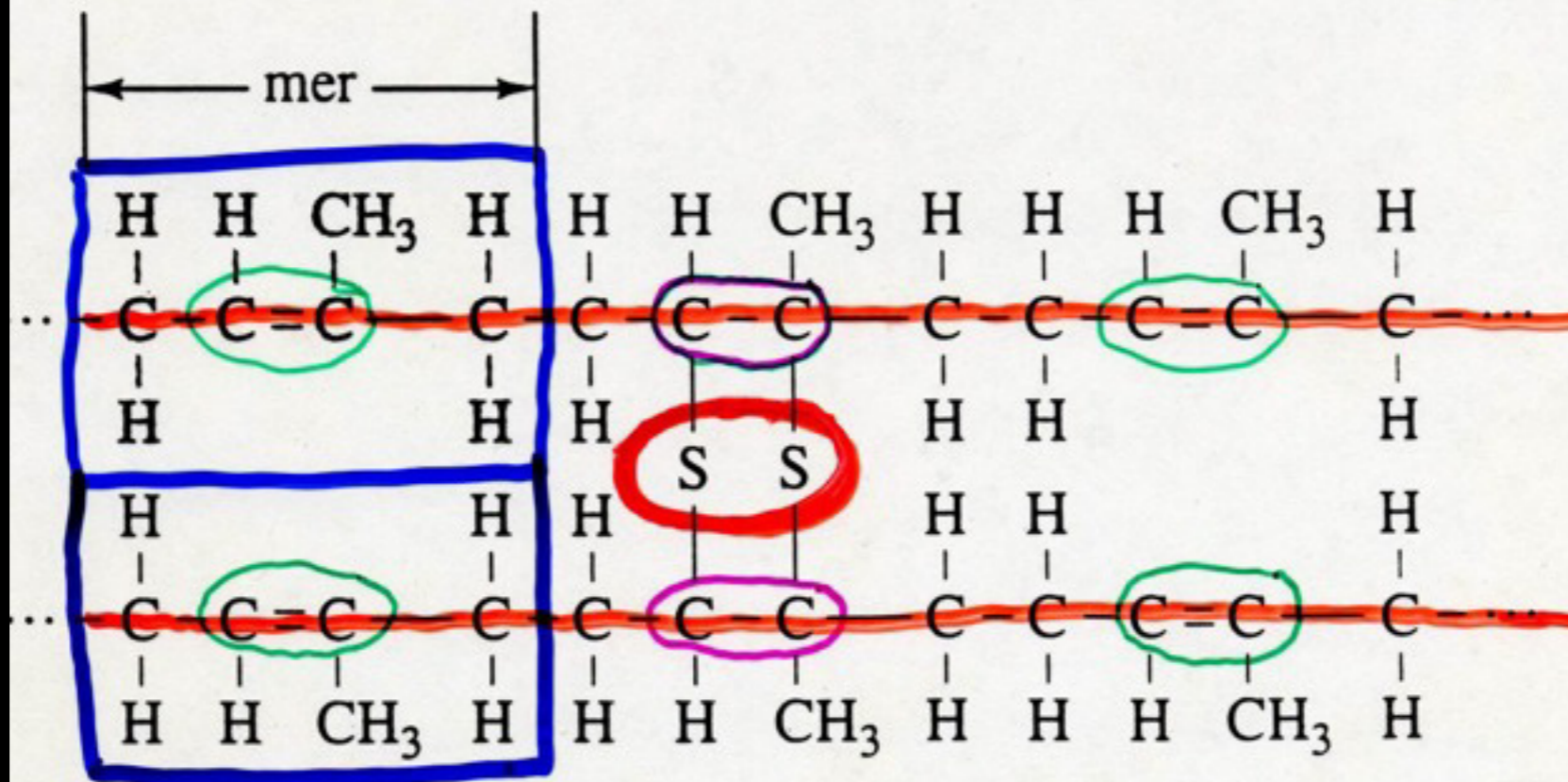
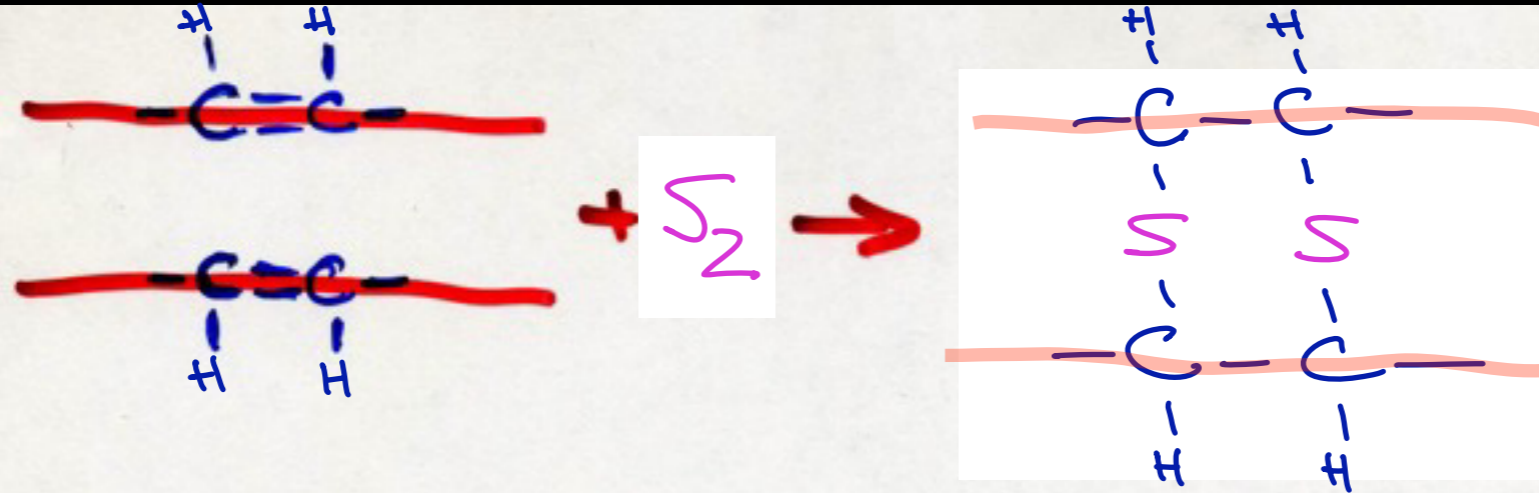


Eclipsed

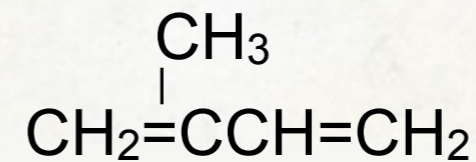


$C_{17}H_{36}$: 2 different conformations, both straight chain





2-methyl 1,3-butadiene



Polyisoprene: S enables crosslinking

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3.091SC Introduction to Solid State Chemistry
Fall 2009

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