Lec 7

No.

- $CH_3CH_2CH_3 \xrightarrow{Cl_2/h\upsilon} CH_3CH_2CH_2Cl + CH_3\underset{Cl}{C}HCH_3$

two monohalogenated products

- $CH_3CH_3 \xrightarrow{Cl_2/h\upsilon} CH_3CH_2Cl$

one monohalogenated product.

* Cycloalkane

ex: $C_5H_{10} \xrightarrow{Br_2/h\upsilon} C_5H_9Br + HBr$

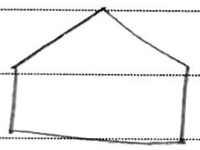
(A) one monohalogenated product (one compound)

$C_5H_{10} \xrightarrow{Br_2/h\upsilon} C_5H_9Br + HBr$

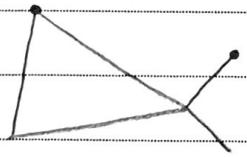
(B) Two different compounds

$C_5H_{10} \xrightarrow{Br_2/h\upsilon} C_5H_9Br + HBr$

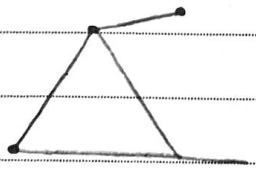
(C) 3 different compounds



(A) one type of hydrogen (equivalent) → one resulted compound.

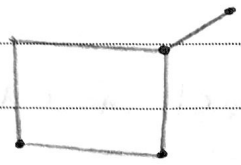


(B) two types of hydrogen → two resulted compounds



(C) three constitutional compounds without considering the stereo isomers (discussed later)

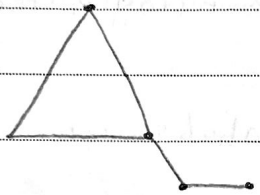
No.



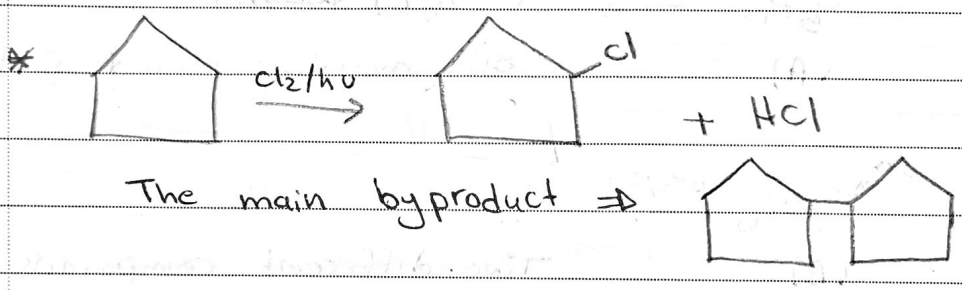
4 different constitutional isomers

2 configurational isomers (cis + trans)

⇒ 6 different compounds



5 different compounds



The main byproduct ⇒

alkele with alkele

(result in termination step)

Alkenes and alkynes

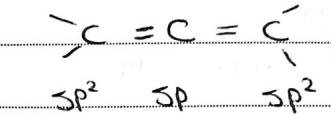
No.

Alkenes ⇒ C=C

Alkynes ⇒ C≡C

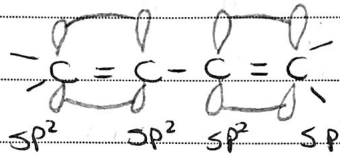
* Types depending on the position of multiple bonds:-

1) Comulated



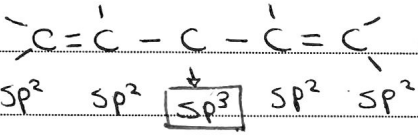
two double bonds on the same C atom

2) conjugated



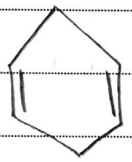
(يوجد تواصل بين P orbitals)

3) Isolated

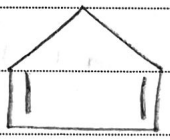


more than single bond between double bonds

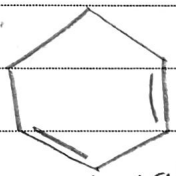
ex:



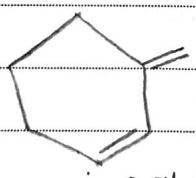
Isolated



conjugated

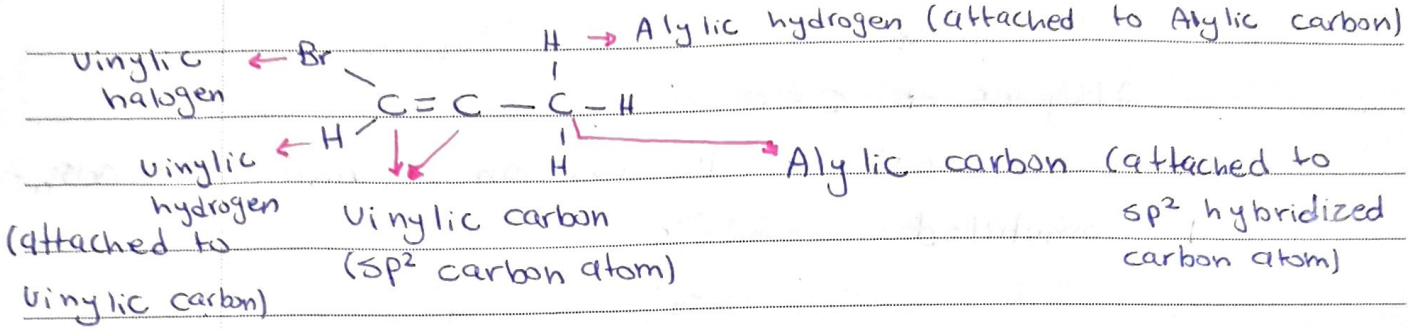


conjugated



conjugated

No.

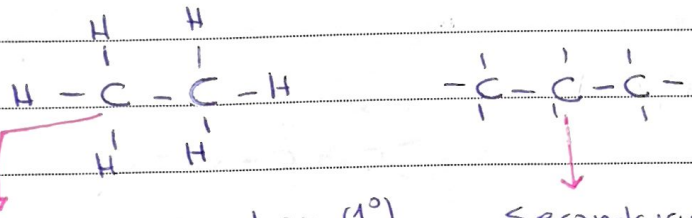


Allylic hydrogen (attached to Allylic carbon)

Vinylic hydrogen (attached to Vinylic carbon)

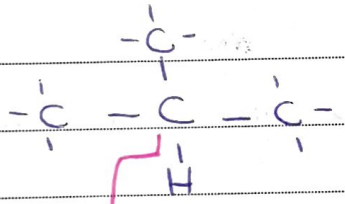
Vinylic carbon (sp^2 carbon atom)

Allylic carbon (attached to sp^2 hybridized carbon atom)

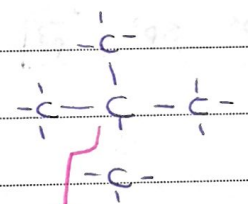


primary carbon (1°) (attached to 1C by single bond)

Secondary carbon (2°) (attached to 2C by single bonds)

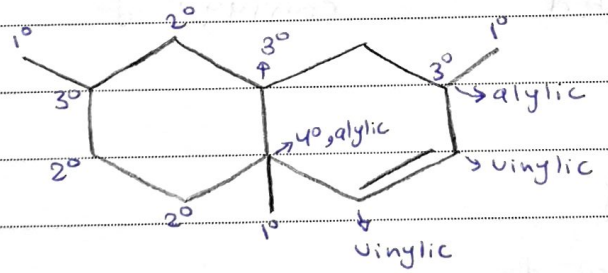


Tertiary carbon (3°)



quaternary (4°)

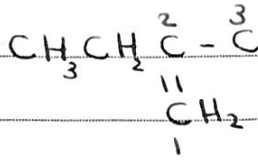
ex:



No.

* Naming

ex:

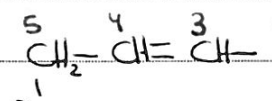


* the chain must contain the double bond
* choose the chain that contains the highest no. of substituents.
* the priority is for double bond to have the smallest number, then for the substituent, then consider the alphabetical order.

answer : 4-bromo-2-ethyl-1-butene

or 4-bromo-2-ethyl-but-1-ene

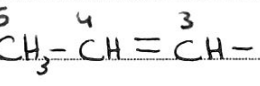
ex:



5-bromo-1,3-pentadiene

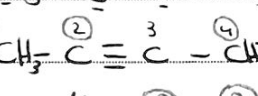
dipentene X

ex:



penta-3-ene-1-yne or 3-pentene-1-yne

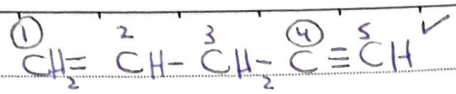
* يوجد أولوية بين الرابطة الثنائية والثلاثية في الترقيم



5 4 (3) (2) 1 ✓ (smallest numbers)

penta-1-ene-3-yne

No.

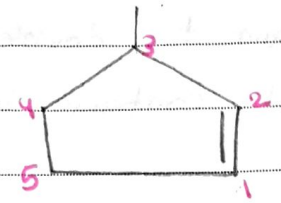


5 4 3 2 1 X

تساوي الأرقام ← حسب الترتيب الأبجدي

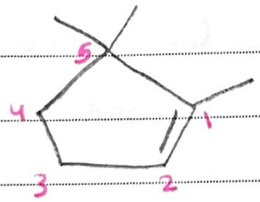
pental-ene-4-yne

ex:



3-methylcyclopentene

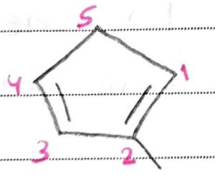
X1-



1,5,5-trimethylcyclopentene

X 2,3,3

(the first substituent must have the smallest number)



2-methyl-1,3-cyclopentadiene