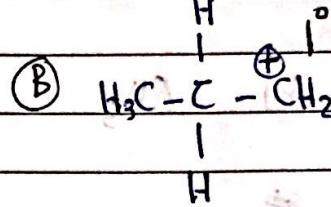
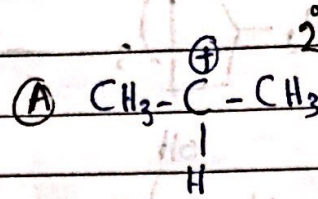
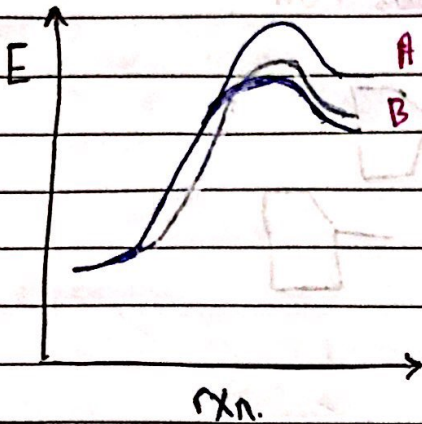
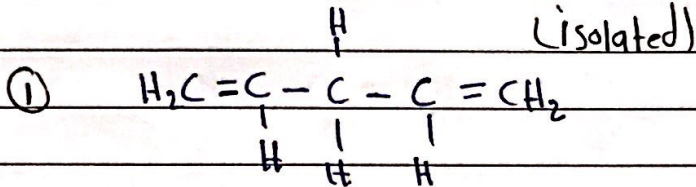


Ex:

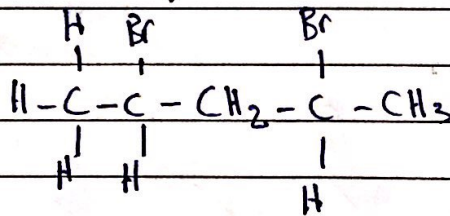


Rxns of alkenes:



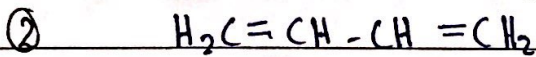
HBr (2 mol)

\* أي isolated مع HBr تتفاعل الألكين من البرين

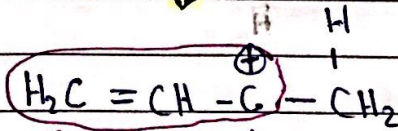


\* أي ابتي غاز (excess)

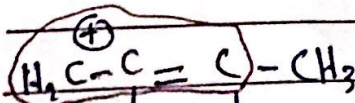
(conjugated)



step (1) | HBr

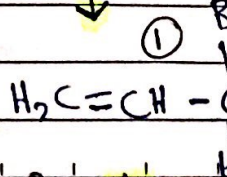


resonance



\* 3 رايونات فيهم = ووحدة كايون allylic carbocation

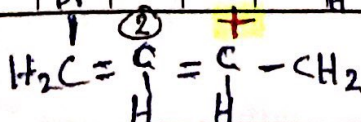
step (2)



allylic carbocation

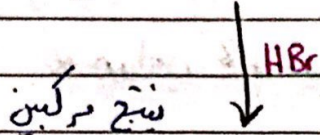
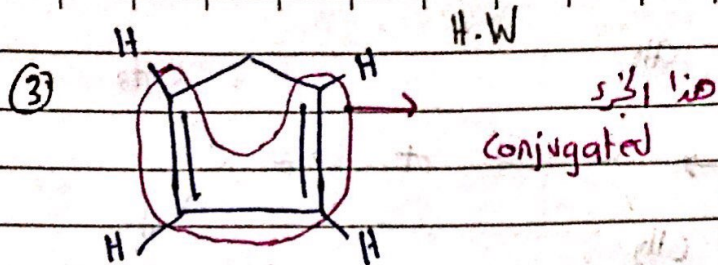
(1,2-addition product)

Br<sup>-</sup>

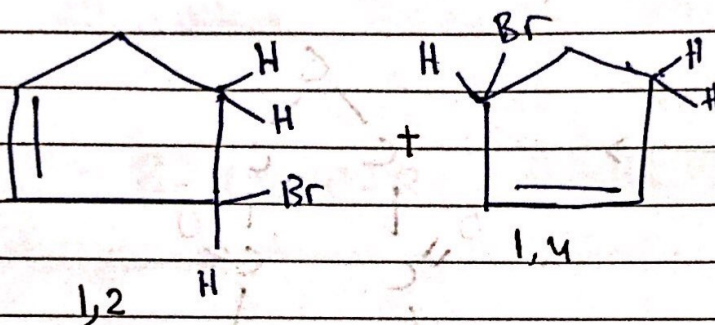


(1,4-addition product)

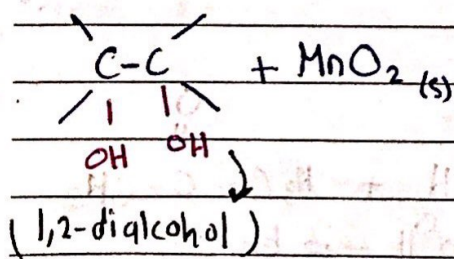
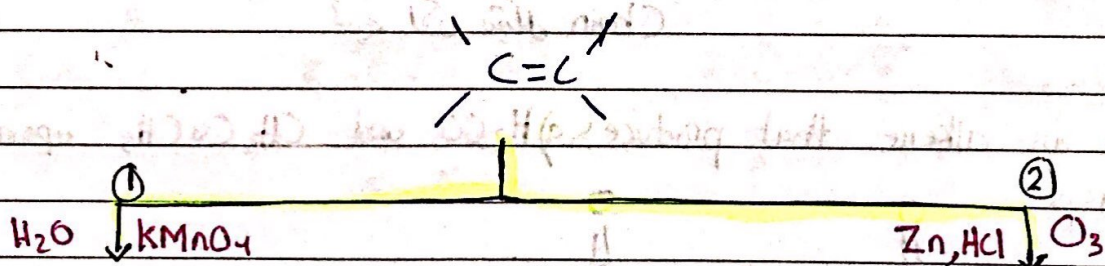
بطلع ناتجين من التفاعل



1,2 + 1,4

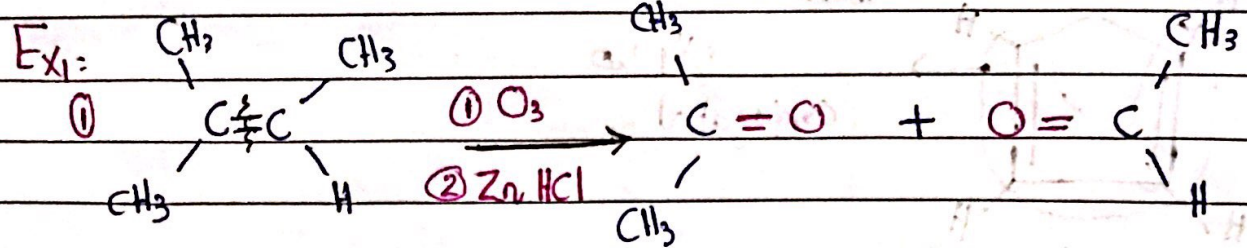


- Oxidation of alkenes: # of oxygen atoms increases.



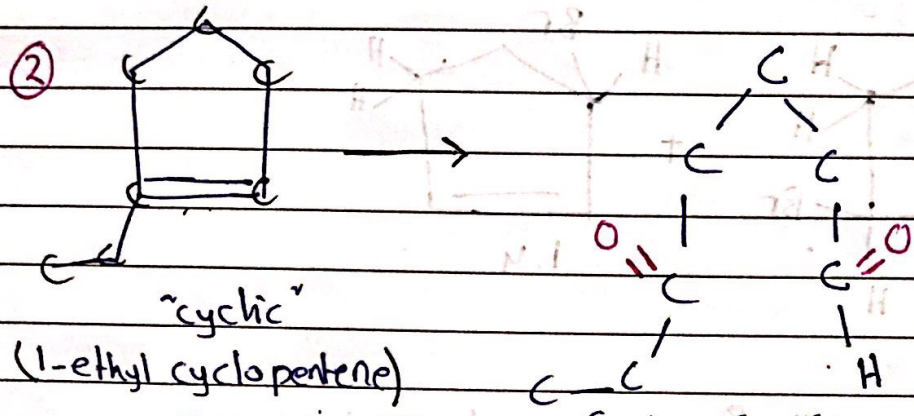
~Ozonolysis~  
Cleavage of alkene  
(break  $\sigma$  &  $\pi$  bonds)  
adding an O atom  
on each carbon.

W.H



chain

\* حواصين لانه سبنا ال chain

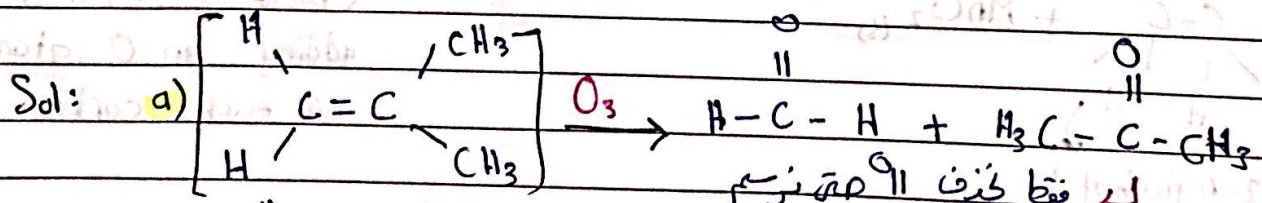
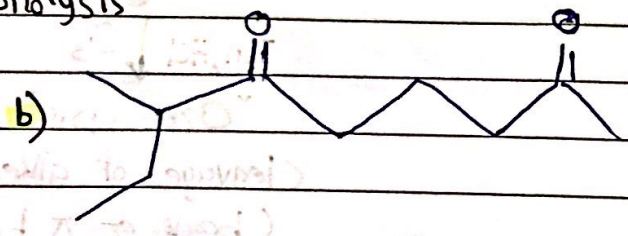


cyclic

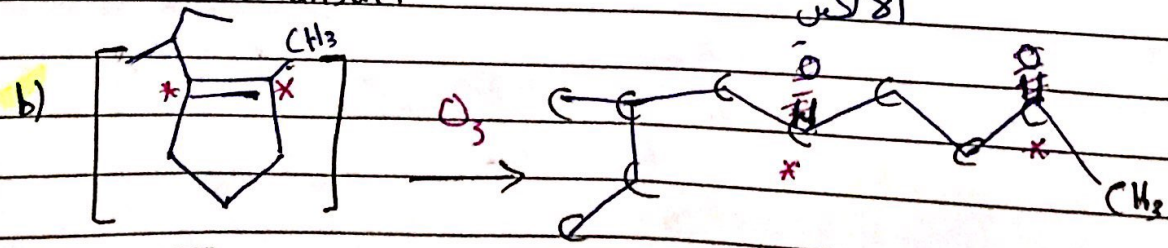
(1-ethyl cyclopentene)

\* نرسم نفس ال cyclic لكن مكان ما نيكسر ال O= زيغ Chain لكن بشكل

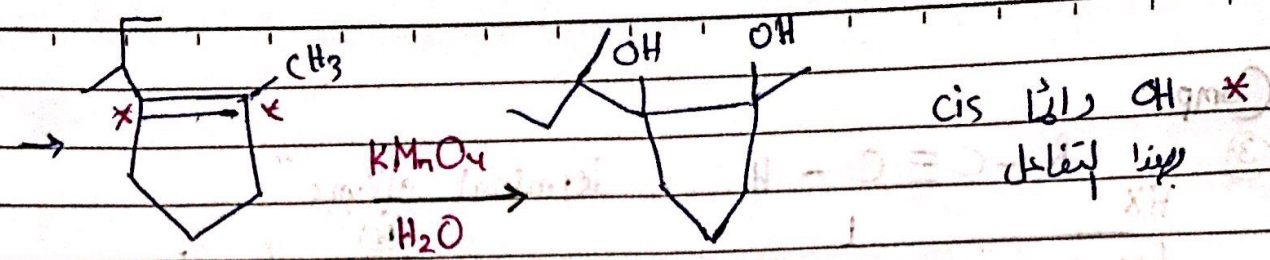
Q: Draw an alkene that produces, a)  $\text{H}_2\text{CO}$  and  $\text{CH}_3\text{COCH}_3$  upon ozonolysis



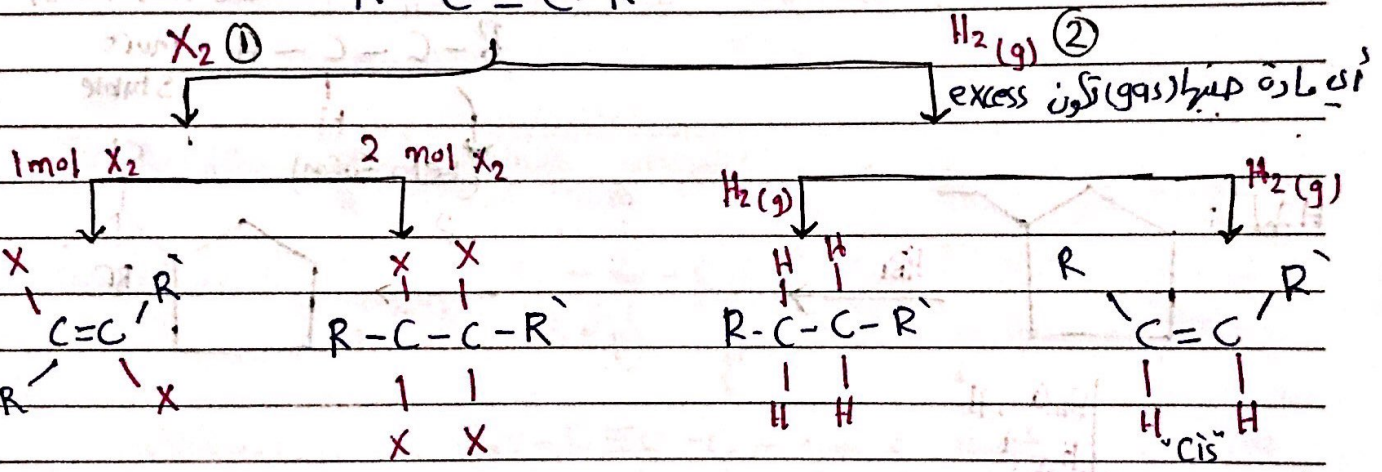
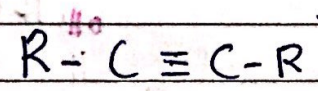
the answer



The answer

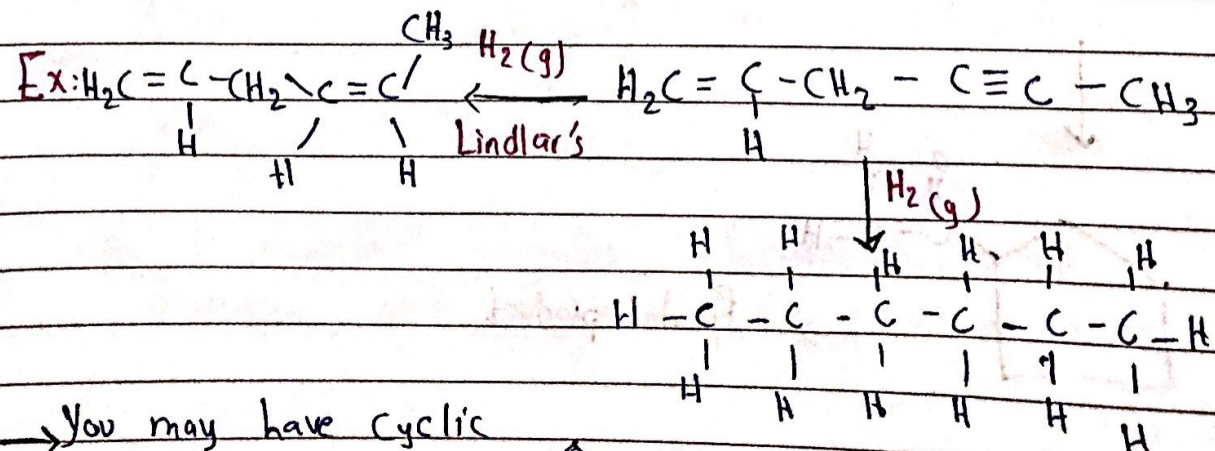


\* Reaction of alkynes: Electrophilic Addition rxn.

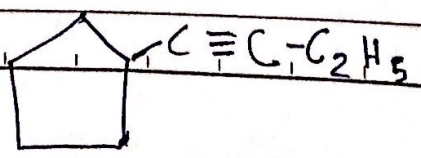


اكسر وحدة ولا زف \*  
 $\text{X}_2$  اكسر زوجين  
 (trans)

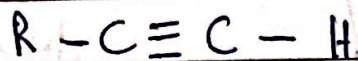
اكسر وحدة  $\text{X}$  و  $\text{H}$   $\text{cis}$  \*  
 "Lindlar's Catalyst"  
 - It doesn't affect on alkene.



→ You may have cyclic



③

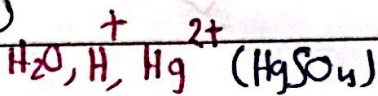


Terminal alkyne

HX

Markovnikov's rule

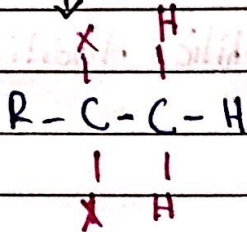
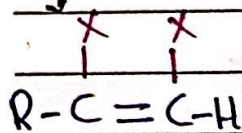
④



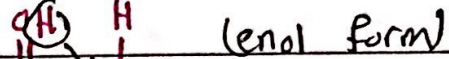
1 mol HX

2 mol HX

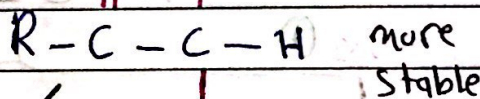
only (1)  $\pi$  bond is broken



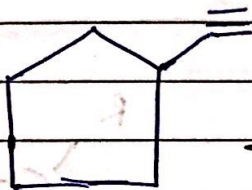
Markovnikov's rule  
 $R-C \equiv C-H$  less stable



tautomerization  
rapid equilibrium  
between keto  
and enol forms

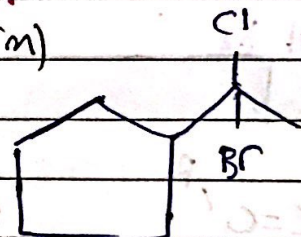


H.W. =

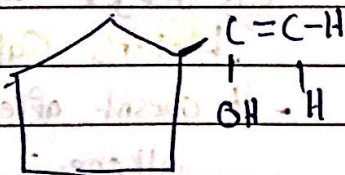


HBr

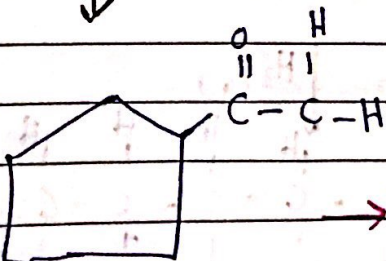
?



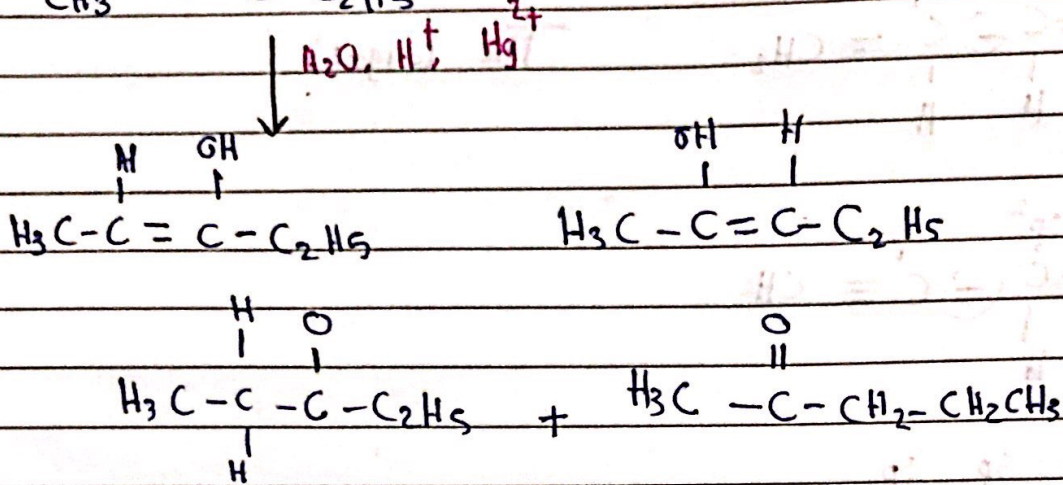
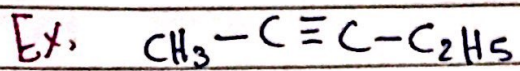
$H_2O, H^+$   
 $Hg^{2+}$



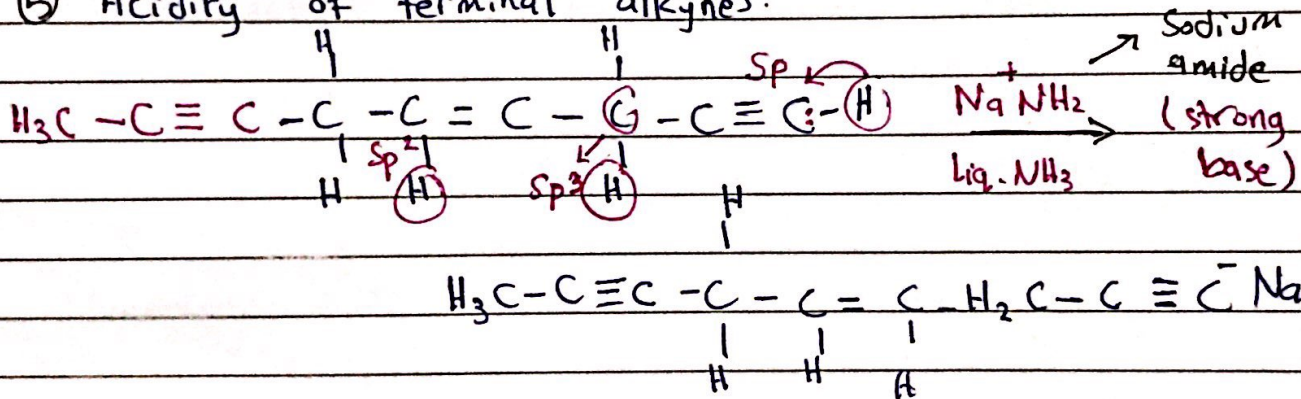
↓



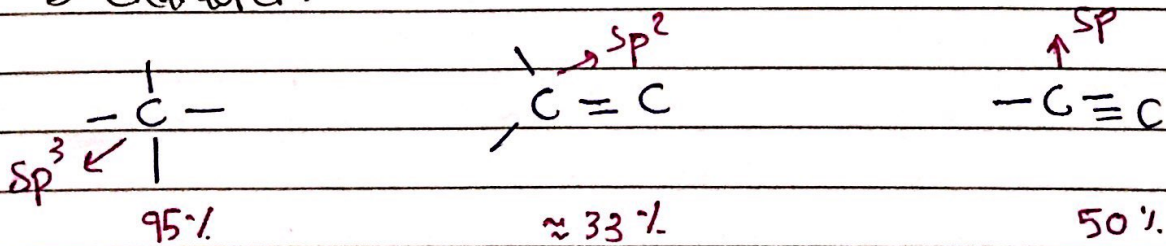
Final product



⑤ Acidity of terminal alkynes:



S-character:



As S-character increases, electronegativity of C increases, and length of the bond decreases.

P.109, 3.37 = The longest carbon single bond is:

