

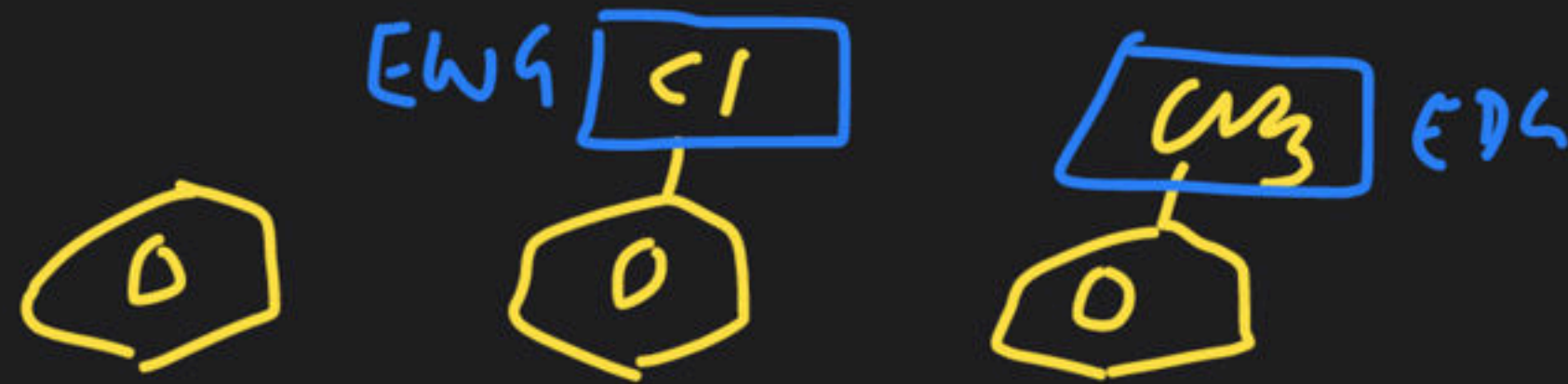


# Hyperconjugation and Hyperconjugation Effects

Course on General Organic Chemistry for Class XI

HW

(a)



(-CH<sub>3</sub> EDG)

(-Cl Net withdrawing)

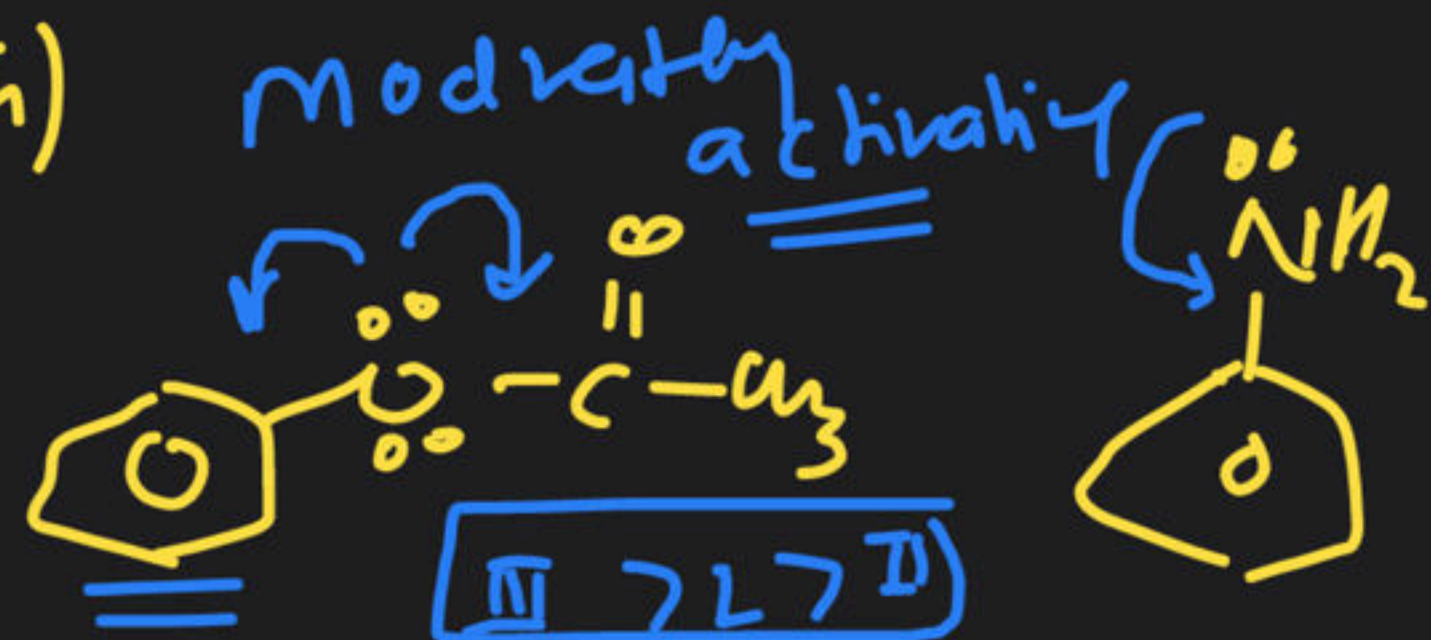
- (A) I > II > III  
(B) III > II > I (30%)  
(C) III > I > II  
(D) NOT

(b)



(-OCH<sub>3</sub> +R)  
EDG

(-NO<sub>2</sub> EWG)  
-R



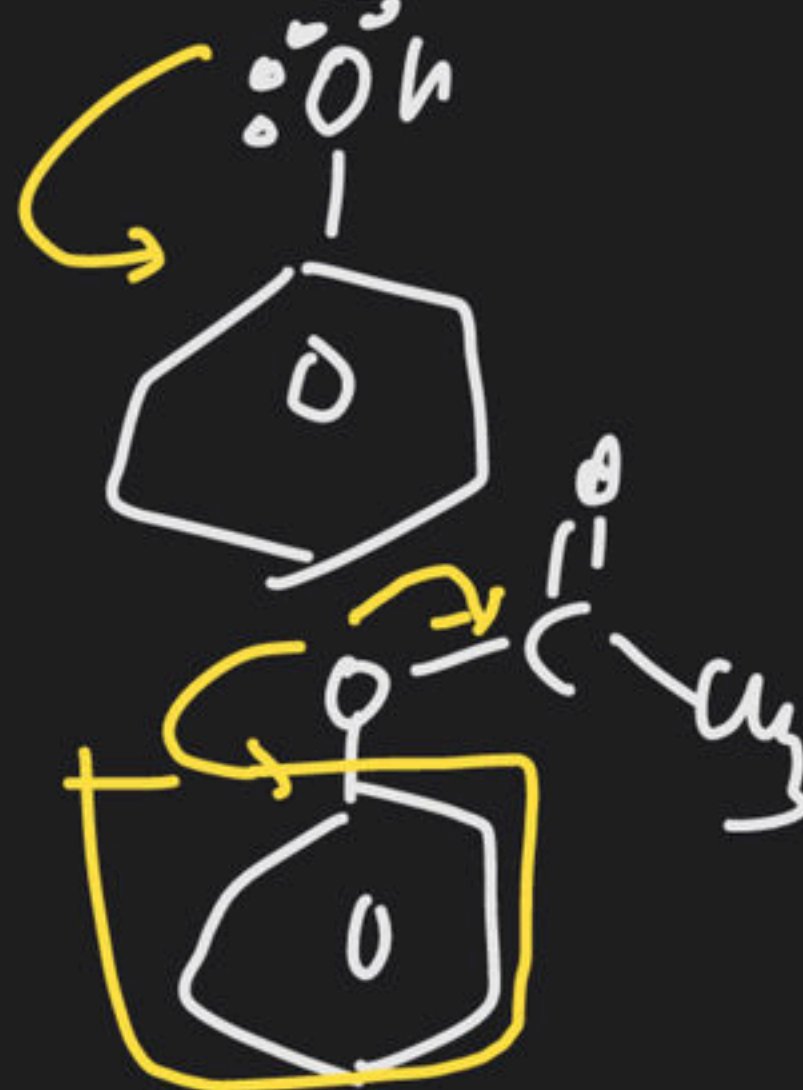


(+R)



$E^+$

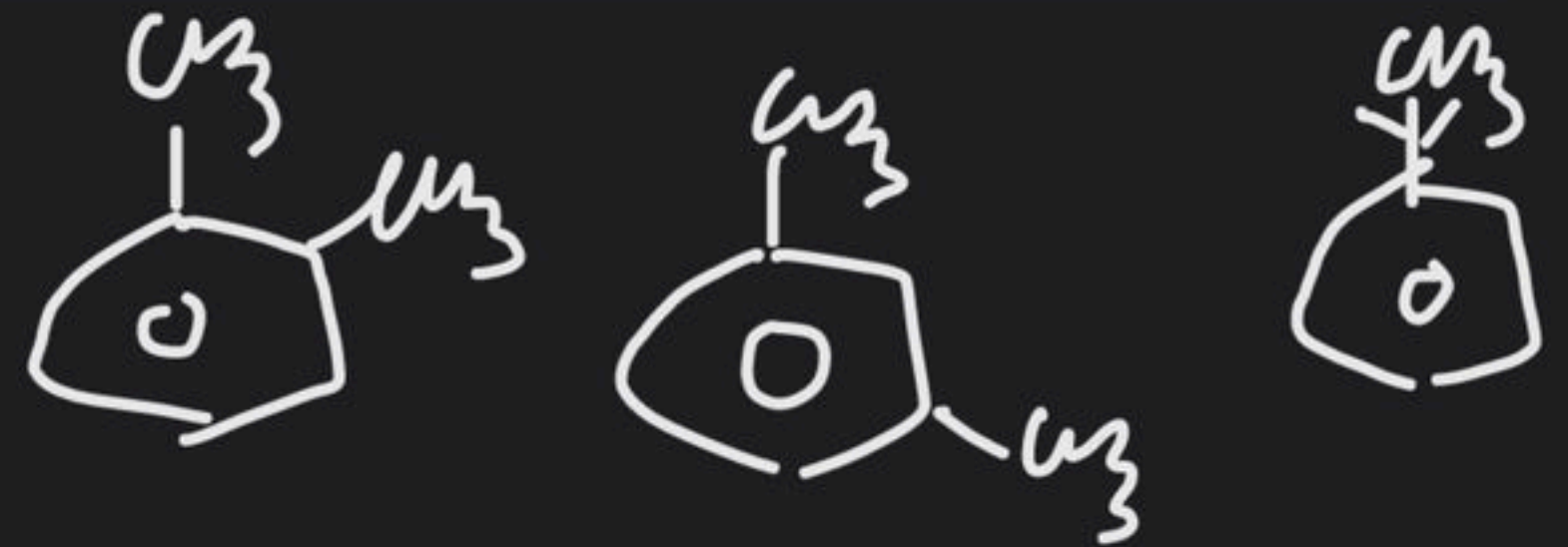
(+R)



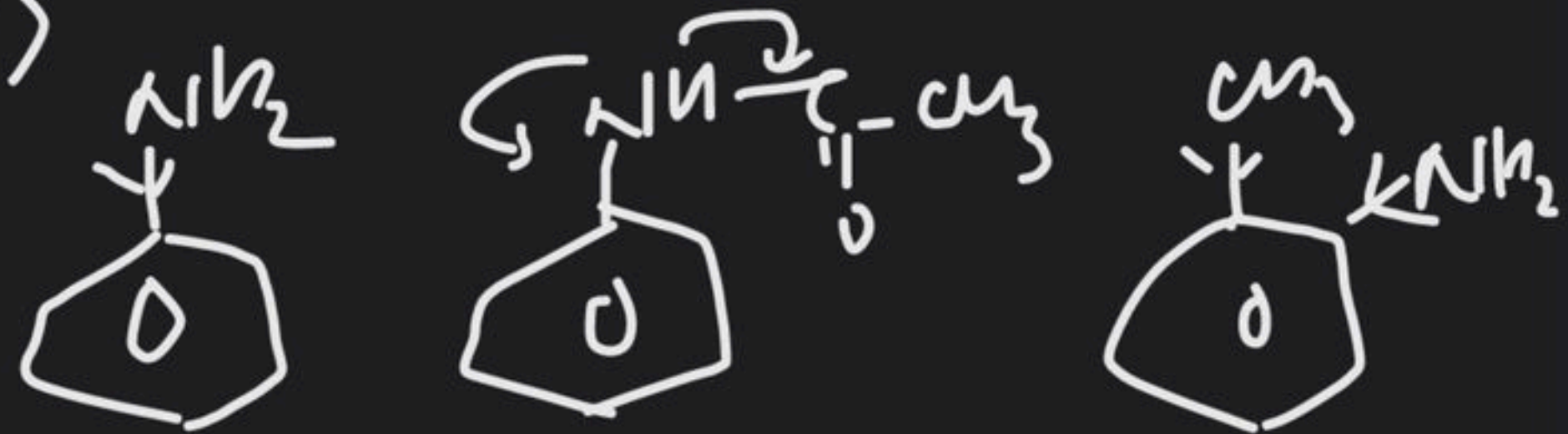
$E^+$

$E^+$

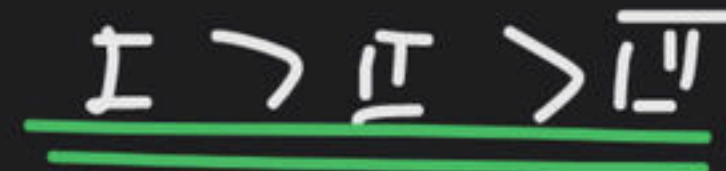
(d)



(e)



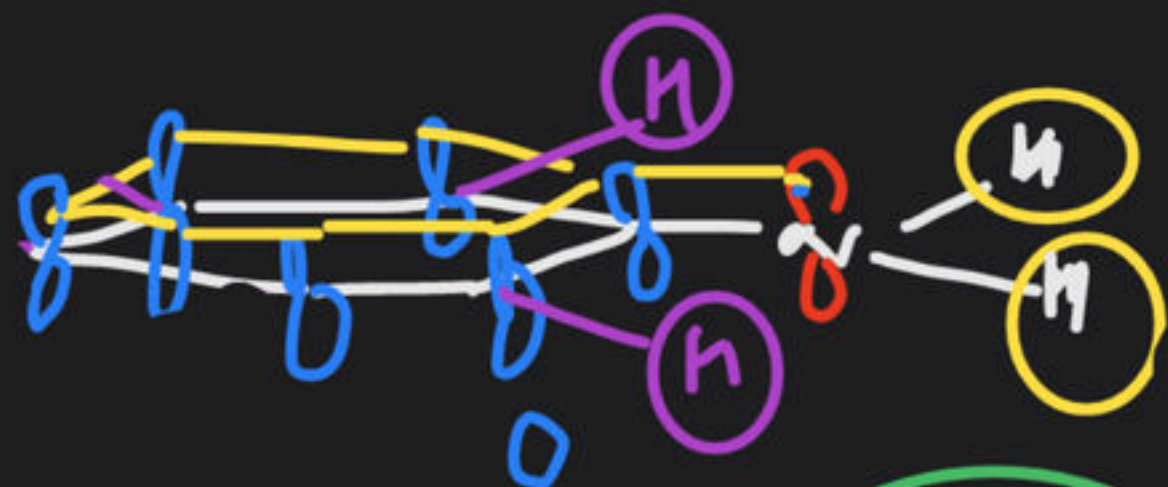
(f)



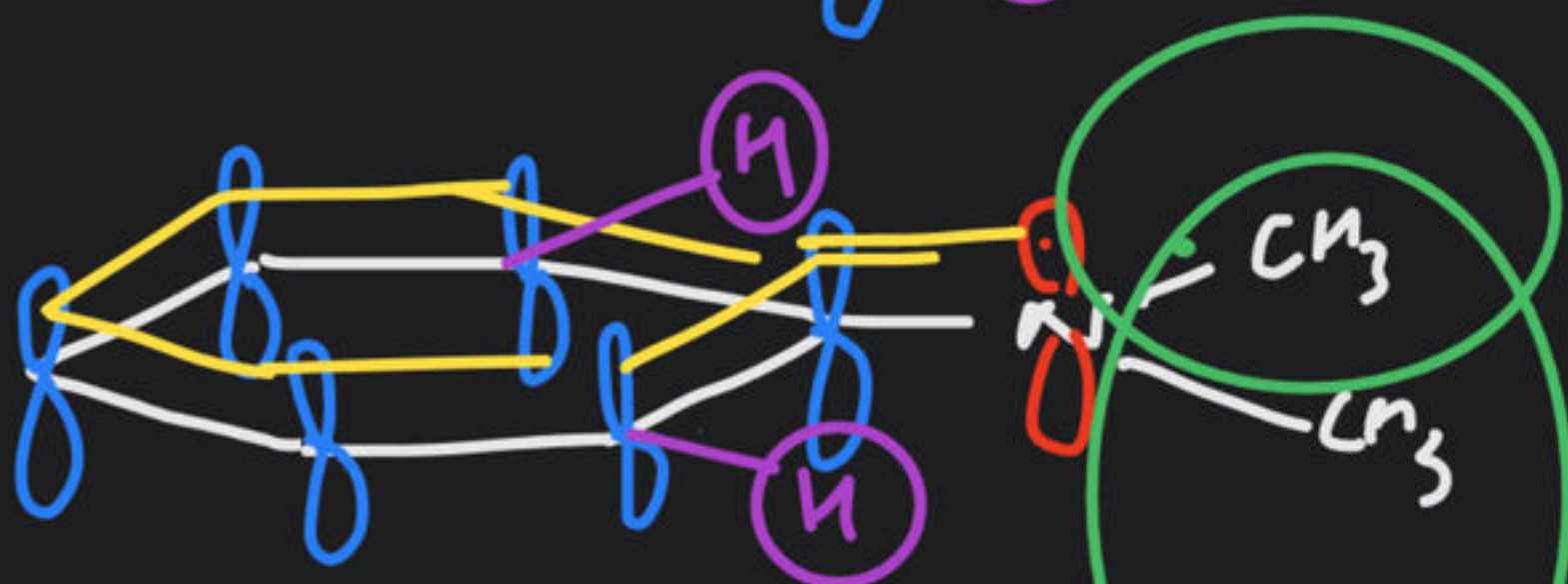
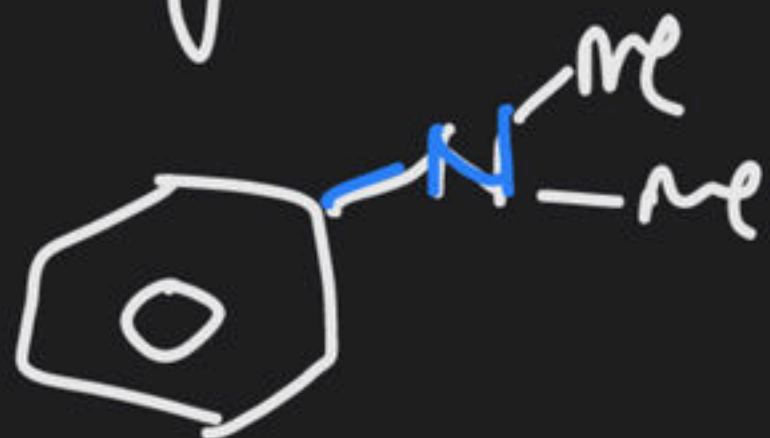


# SIR effect (Steric Inhibition of Resonance):

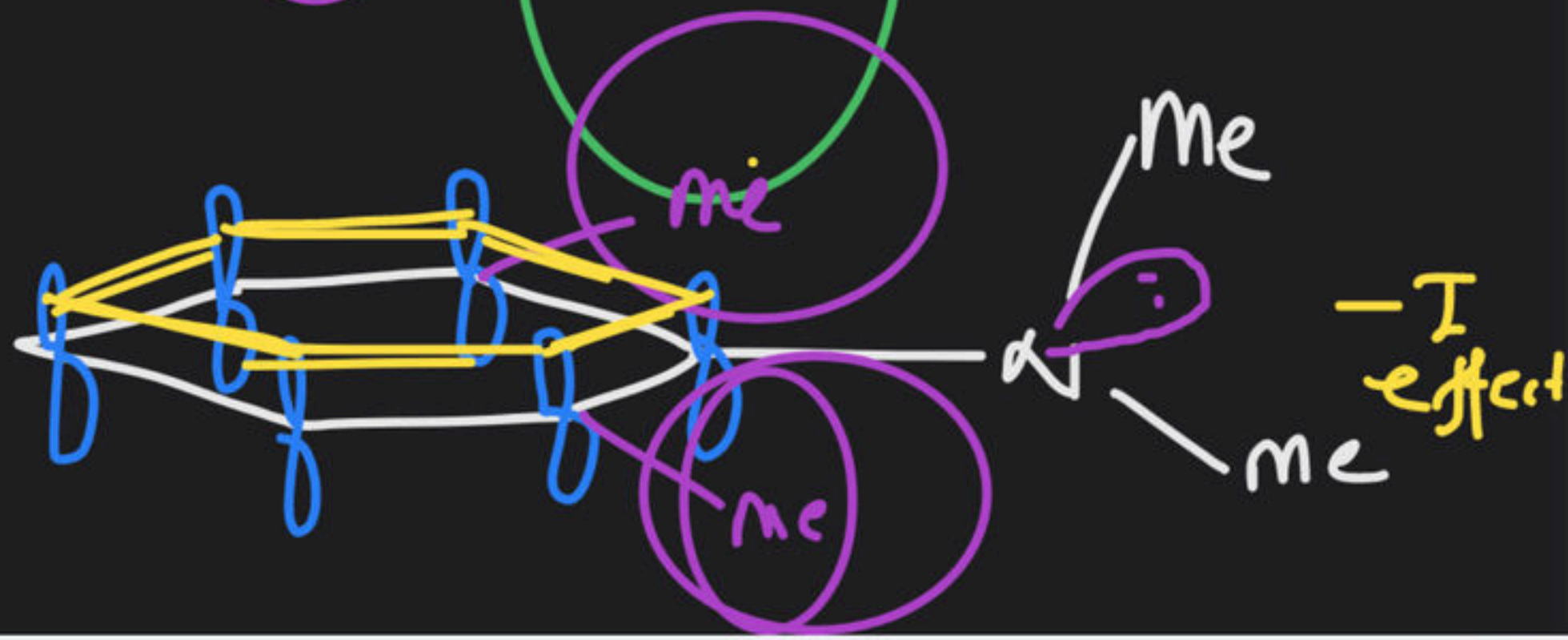
Inhibition of Resonance due to Steric factor is known as SIR effect.



+R/+m effect  
-I effect



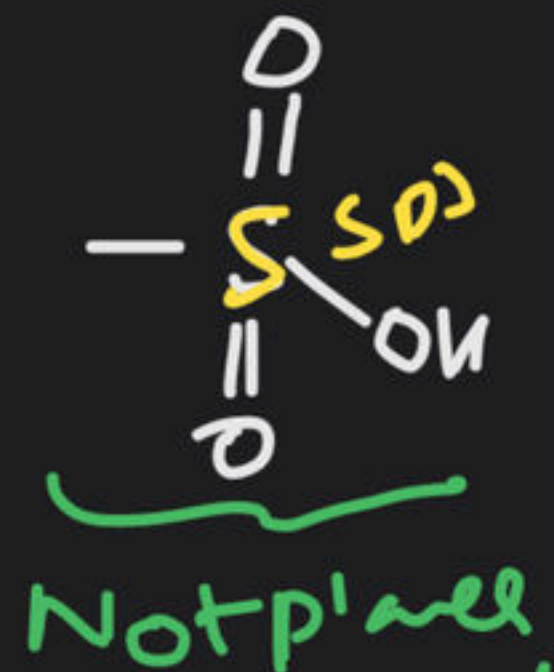
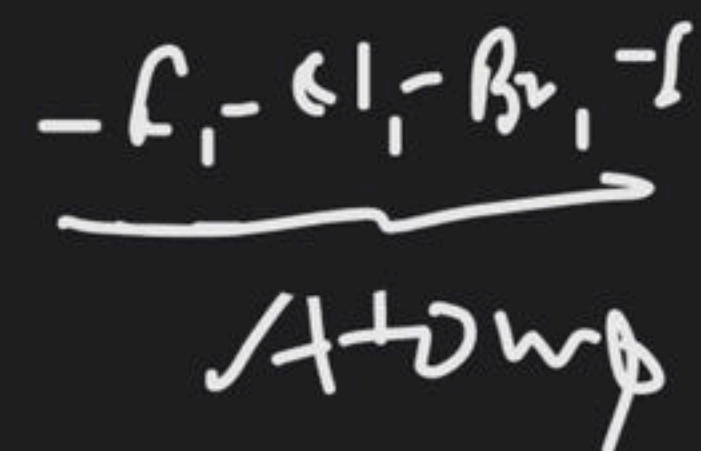
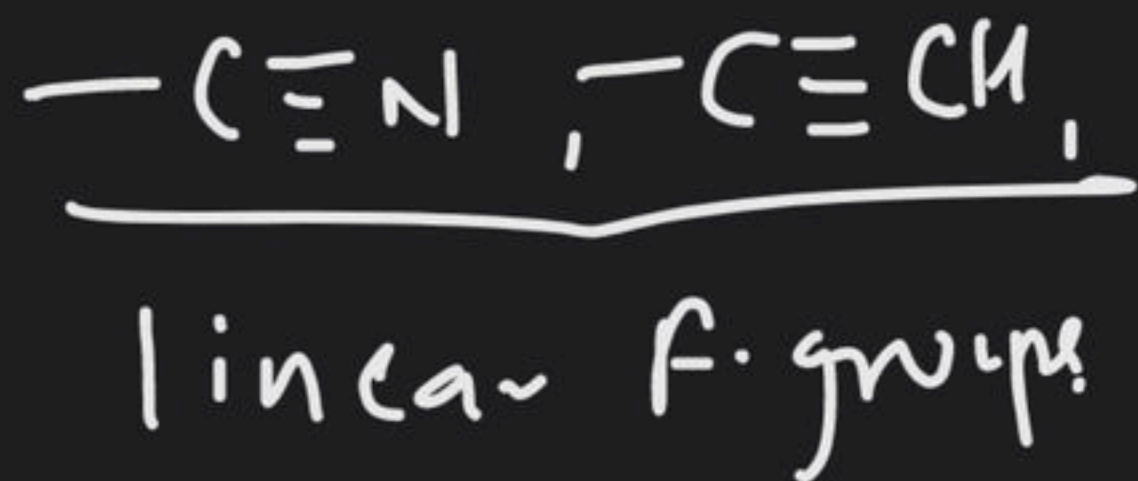
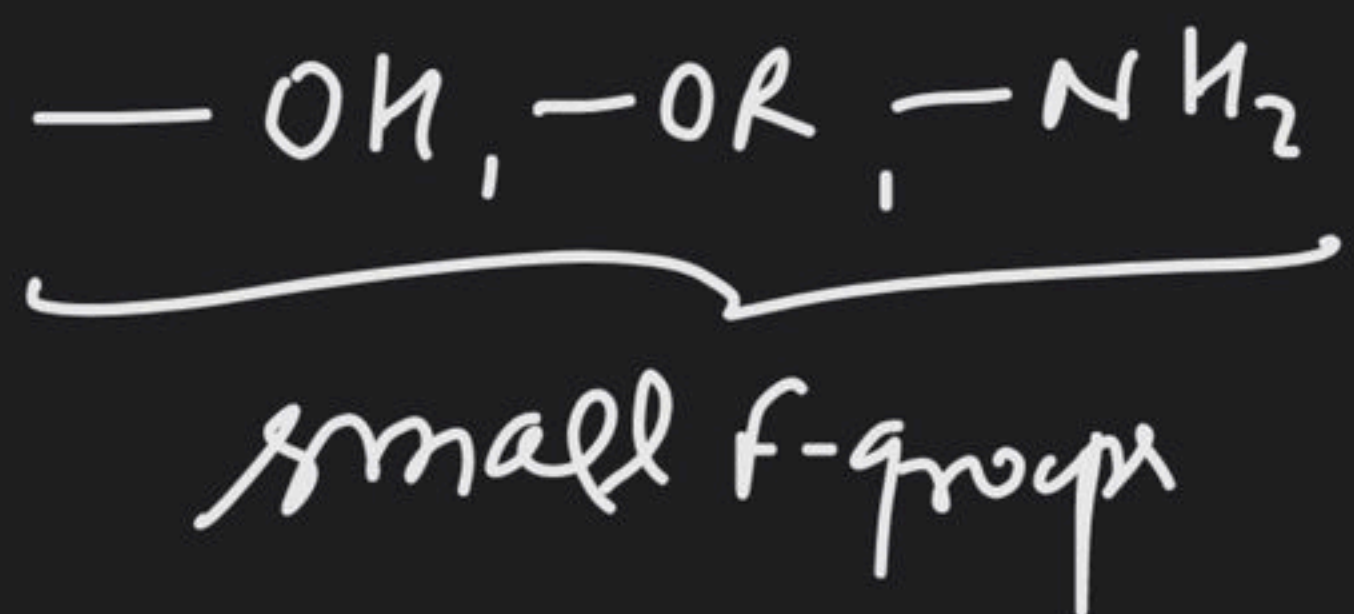
+R/+m effect  
-I effect



-I effect

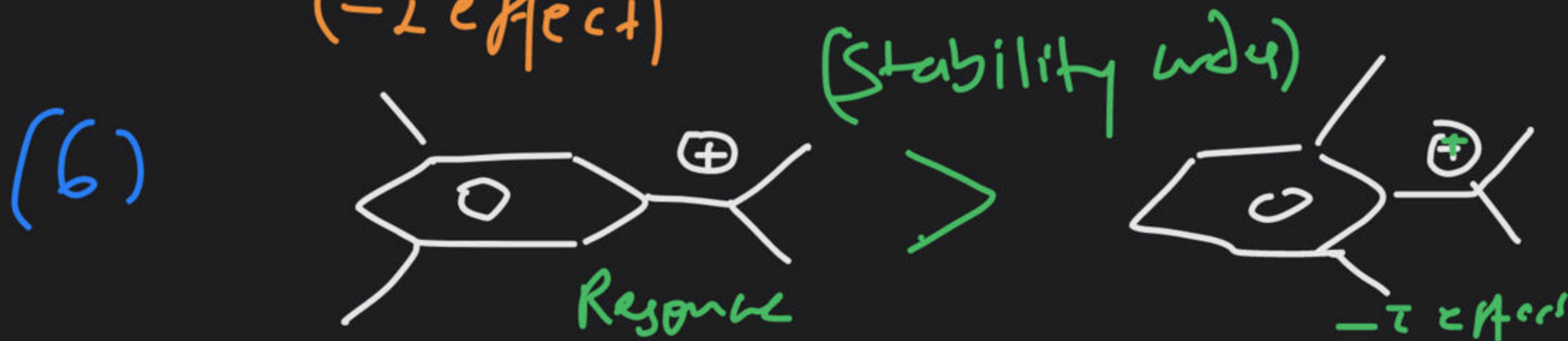
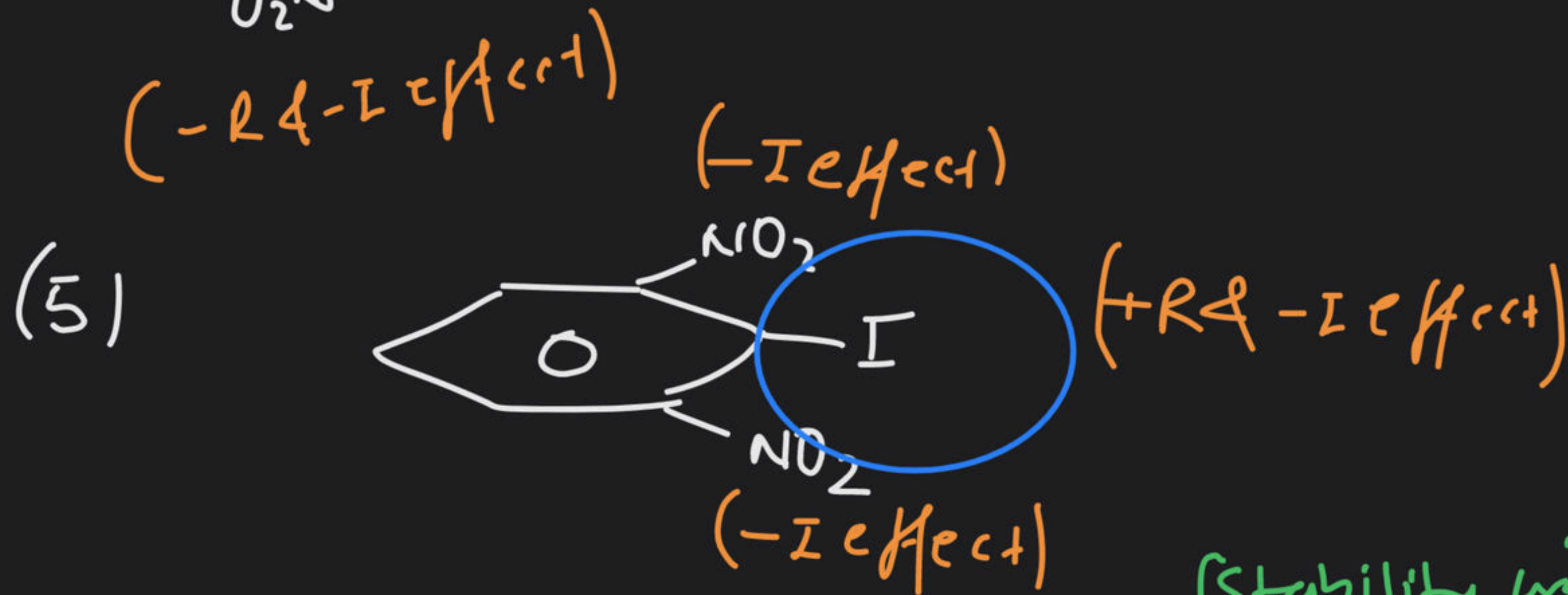


Note: (i) Functional groups which are not affected  
By SIK



(ii) Functional groups which are affected by SIK



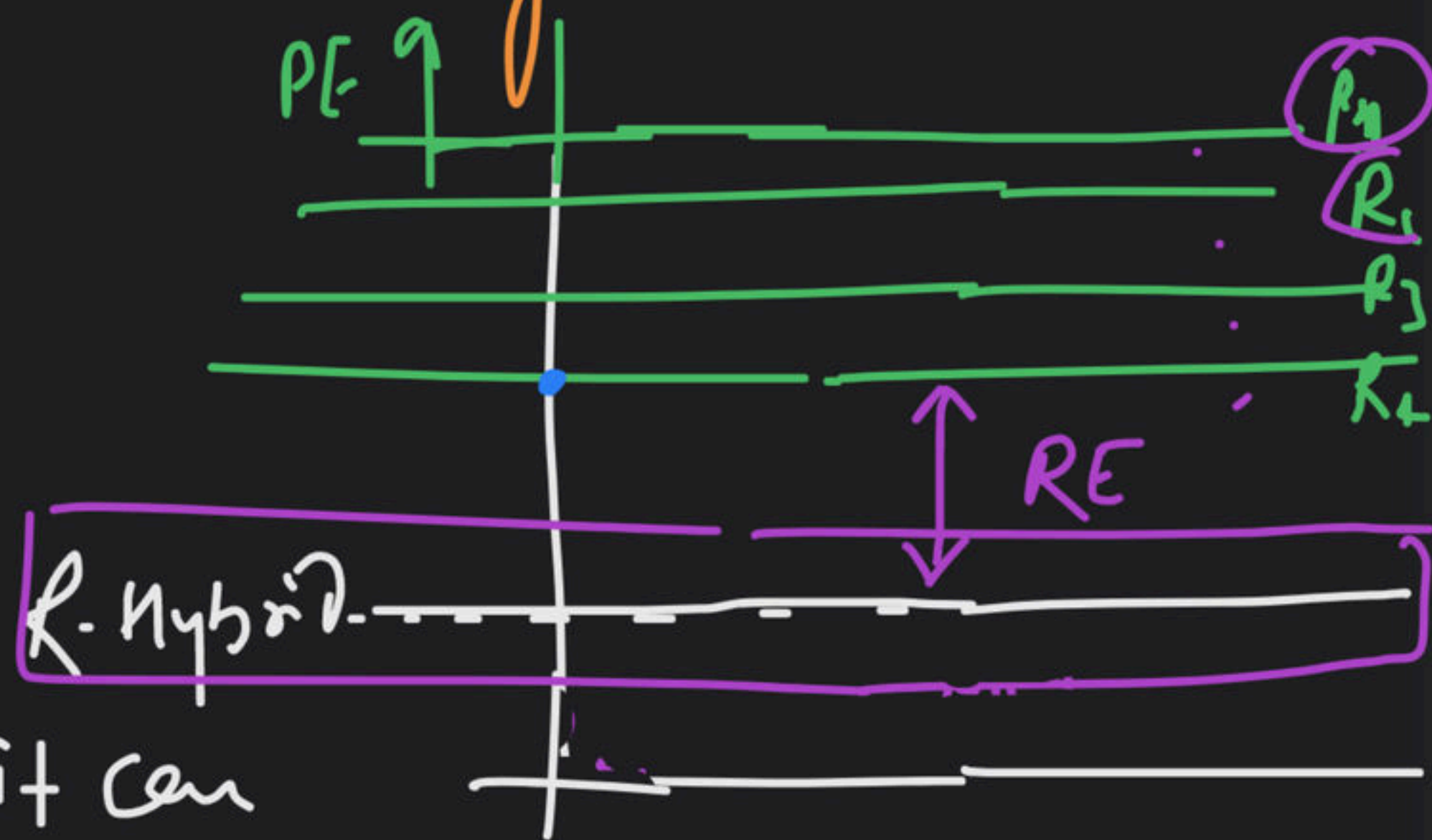




## (#) Resonance Energy

⇒ Energy difference by which Resonance Hybrid is more stable than its most contributing R.S.

$$R.E = E_{R.Hybrid} - E_{m.c.R.S}$$



Note: (i) RE can't be calculated, it can be estimated only.



(ii) Resonating str. of same Compound Containing same RE.

(iii) Resonance Energy  $\propto$  Extent of Resonance:

$\propto$  No. of R. Str.

$\propto$  Stability<sup>only</sup> (when Resonance is responsible for stability)

(iv) Resonance Energy can also be estimated by  
Heat of Hydrogenation method.

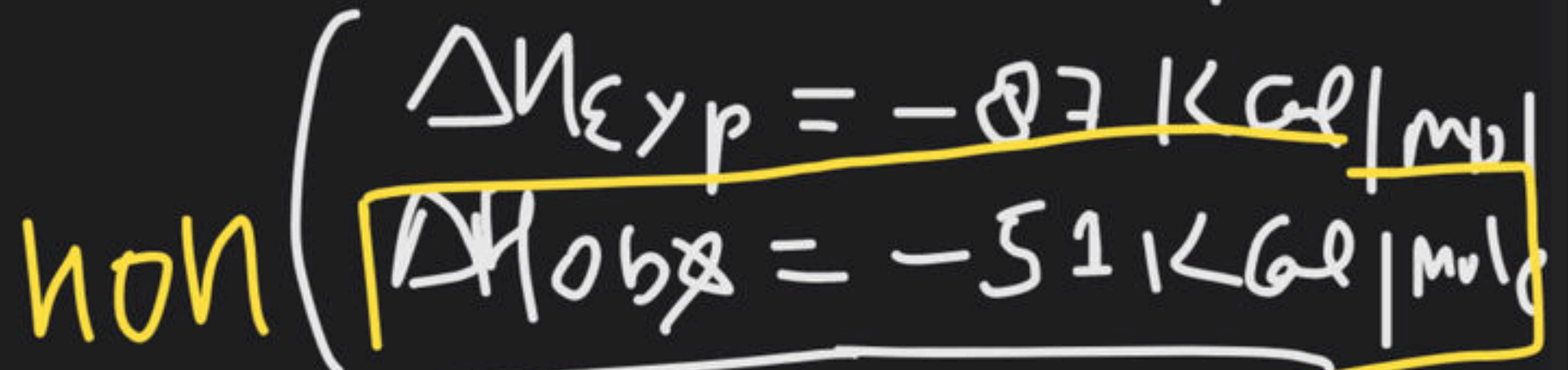
$$RE = \Delta H_{exp} - \Delta H_{obs}$$



~~Ex-11~~ Calculate RE of Benzene from following data

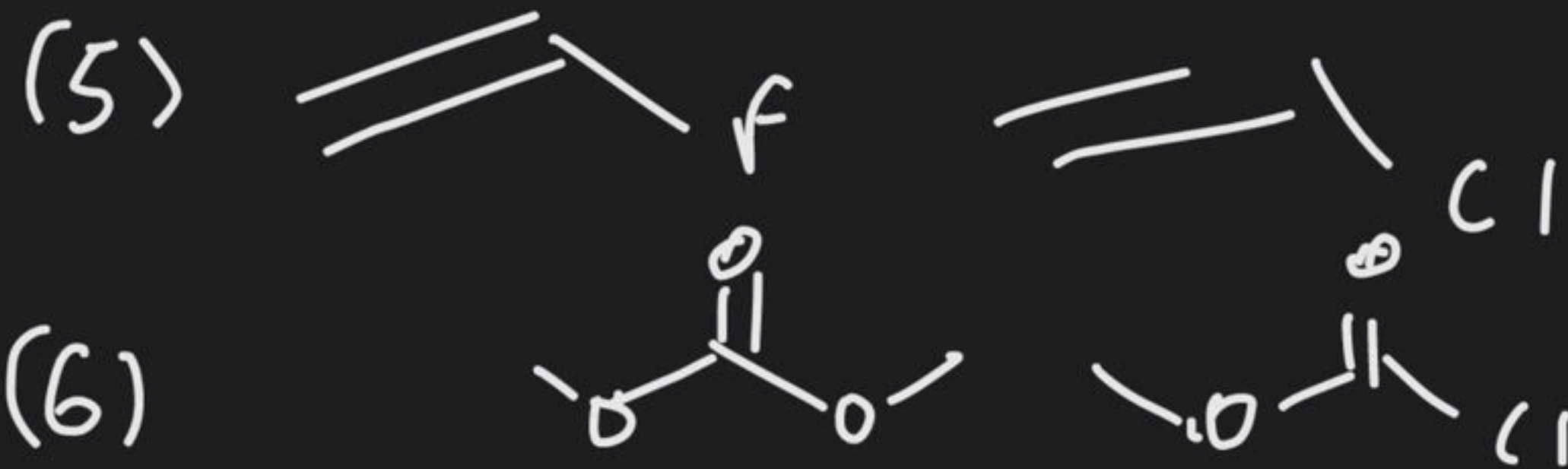
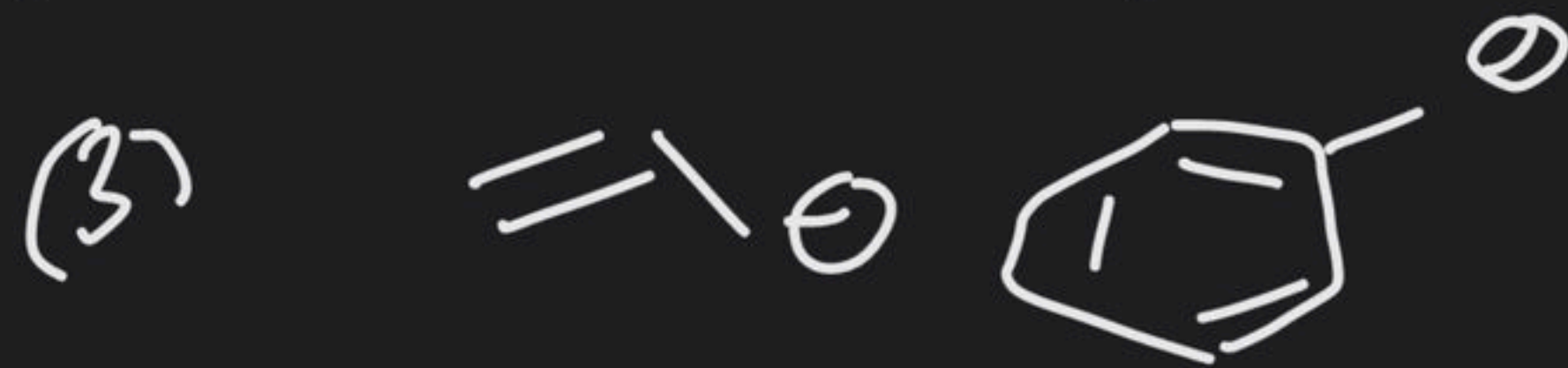


$$\begin{aligned} \text{RE} &= \Delta H_{\text{Exp}} - \Delta H_{\text{obs}} \\ &= -3 \text{ K Cal/mole} \end{aligned}$$



~~RE = -36 K Cal/mole~~









(9)

(per Benzene  
Ring)

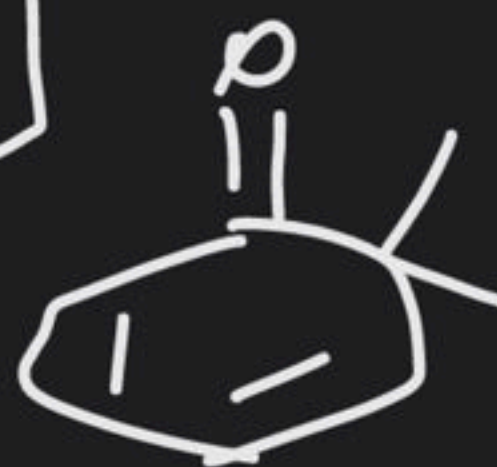
(10)



(11)

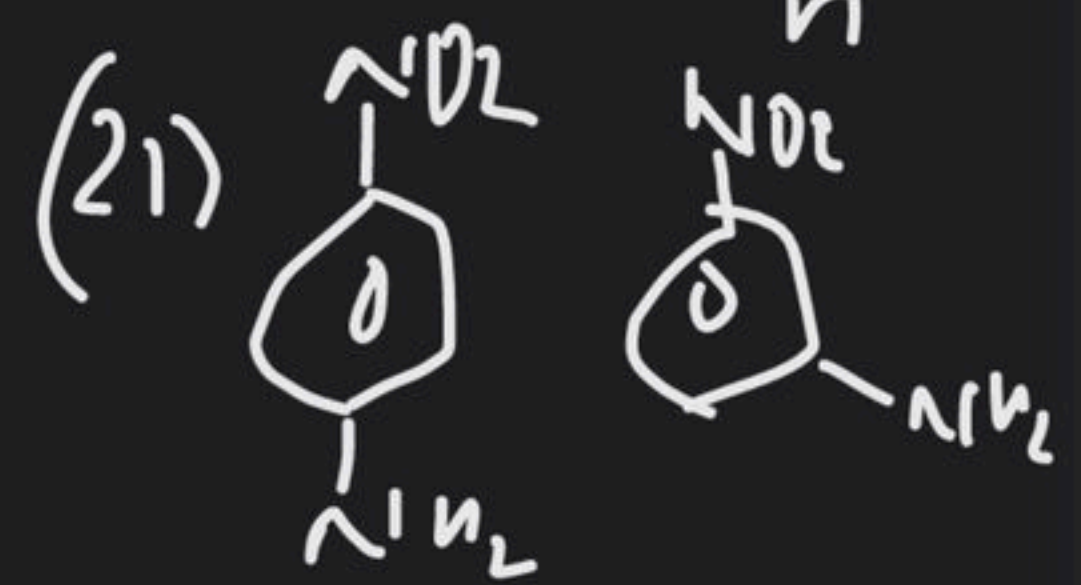
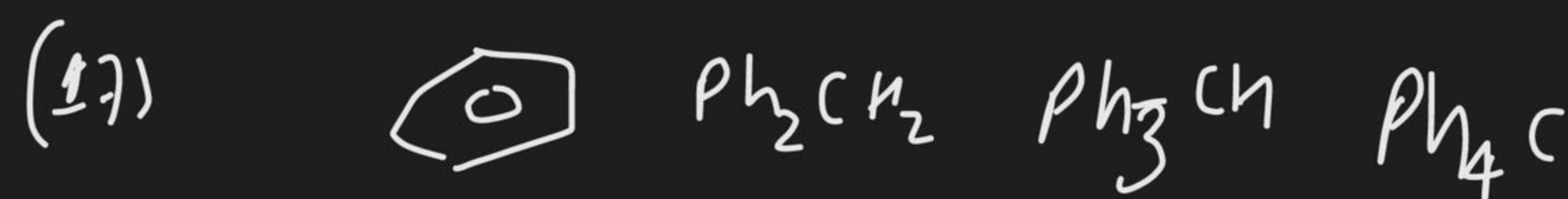
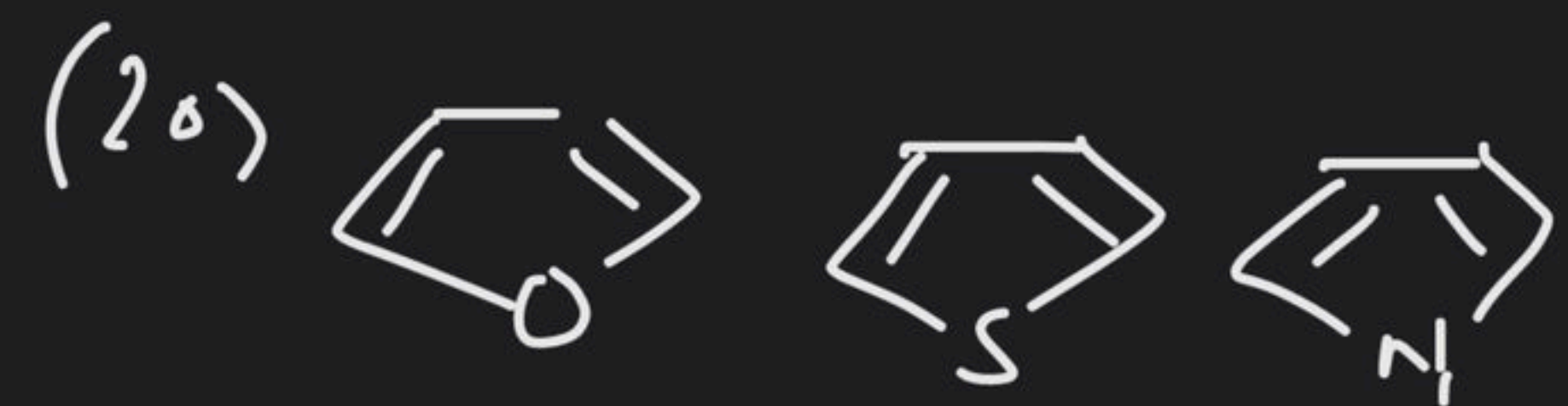
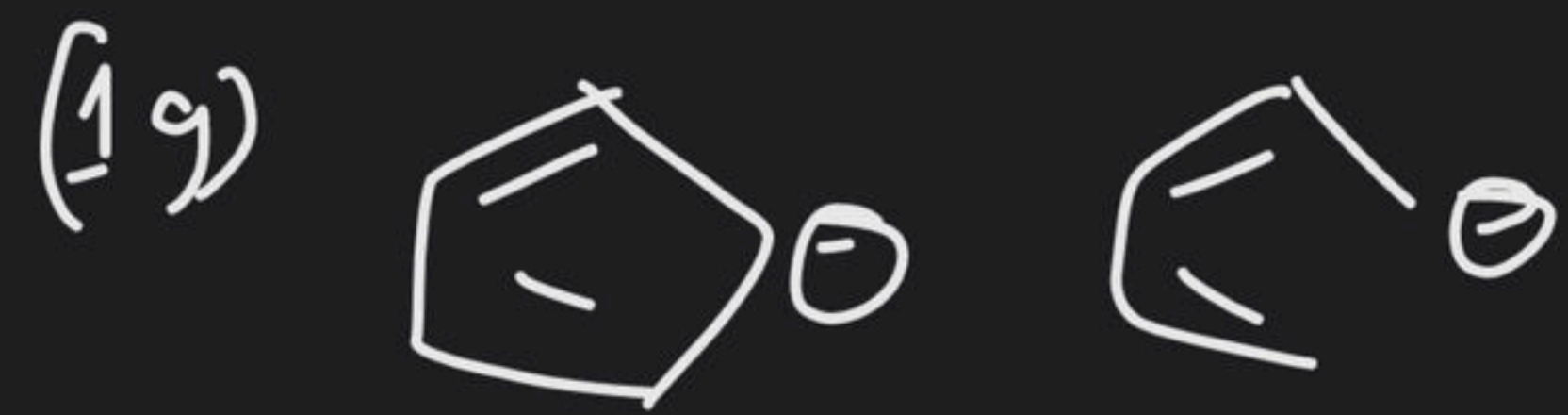
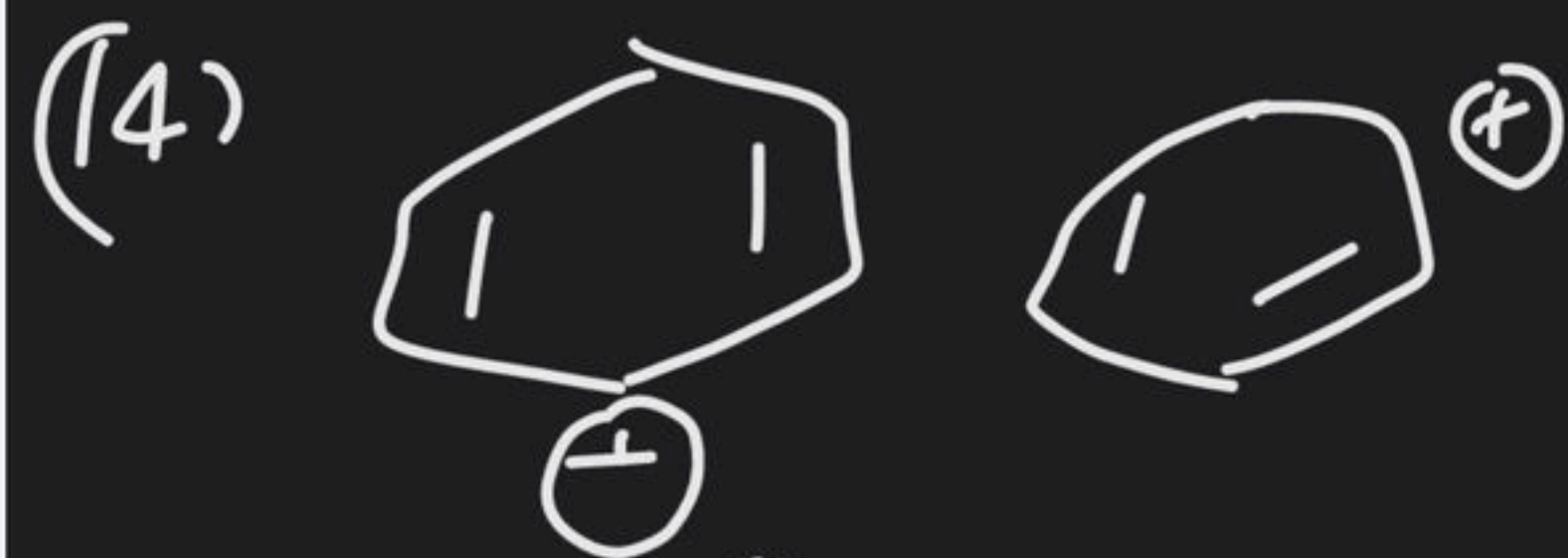


(12)



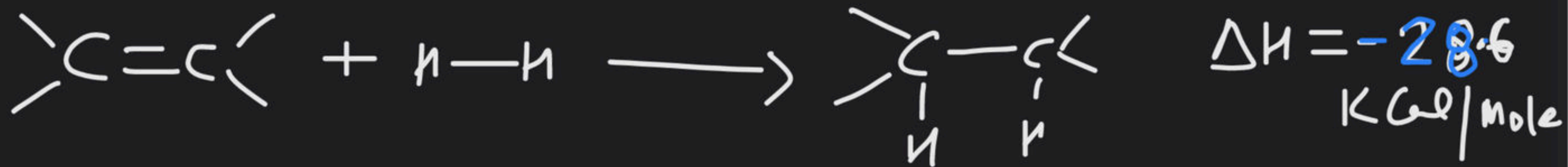
(13)







## (#) Heat of Hydrogenation (H<sub>OH</sub>)



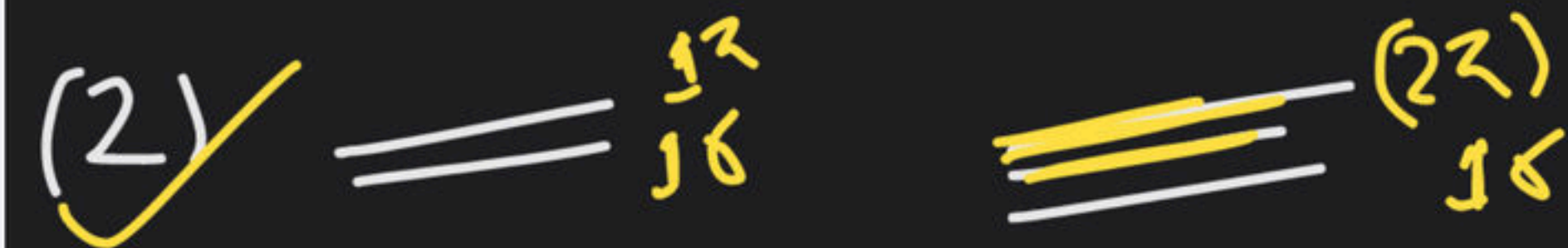
Enthalpy change when 1 mole of any compound is completely hydrogenated (Reduced) is known as Heat of Hydrogenation

Heat of Hydrogenation  $\propto$  No. of  $\pi$  Bond  
(when all or none is Aromatic)  
 $\propto$   $1/\text{Stability}^*$





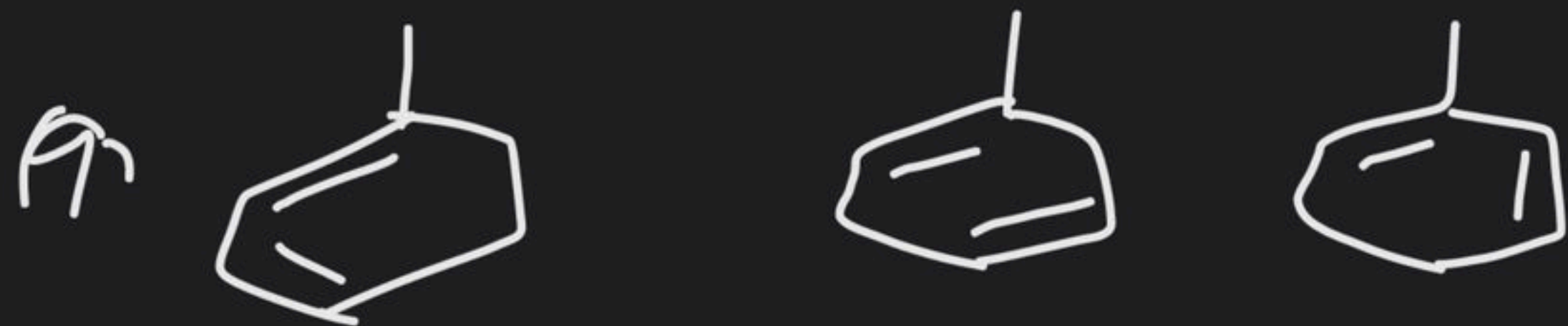
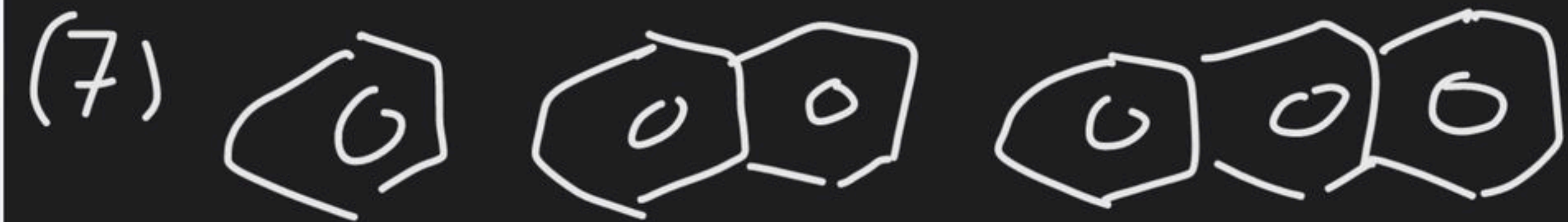
(271)



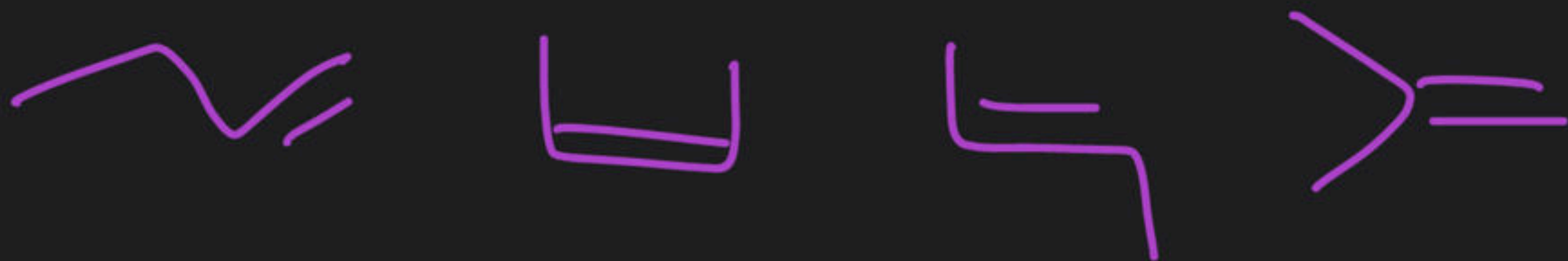
(271)







M.T.P  
(11)





② Sheet discuss IVPAC  
Copy























