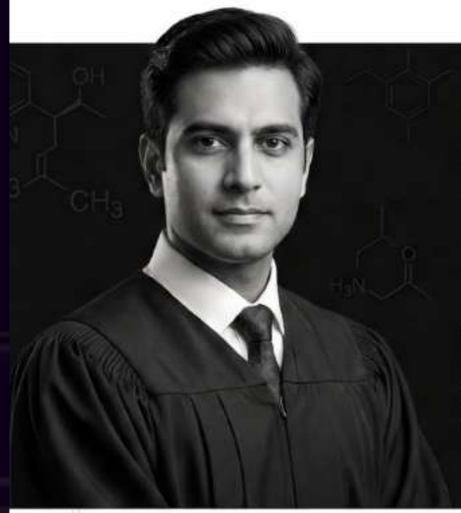
Chiral Academy

CSIR NET
Chemical Sciences



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CSIR NET JRF AIR 01 के खुशी में

★★★ TOPPER'S CELEBRATION EDITION ★★★

NAME REACTIONS

Enolization

LECTURE 02

Complete Chapter Free 🔥

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Avinash Sir

Topics to be cover

#02

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1) Introduction to Tautomerism
2) Condition for Tautomerism
3) Examples and Question

Revision

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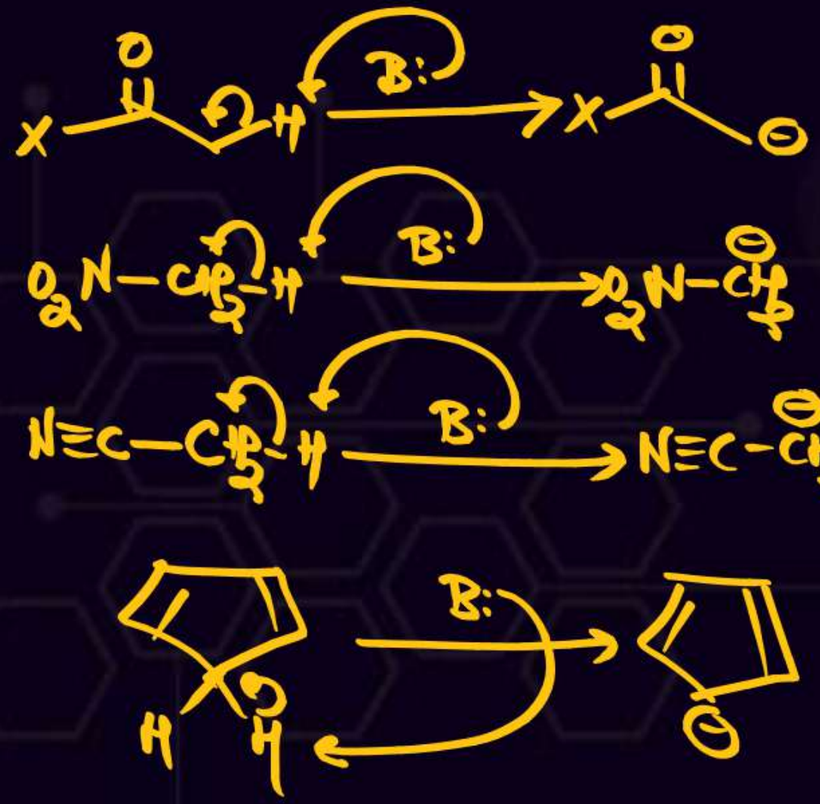
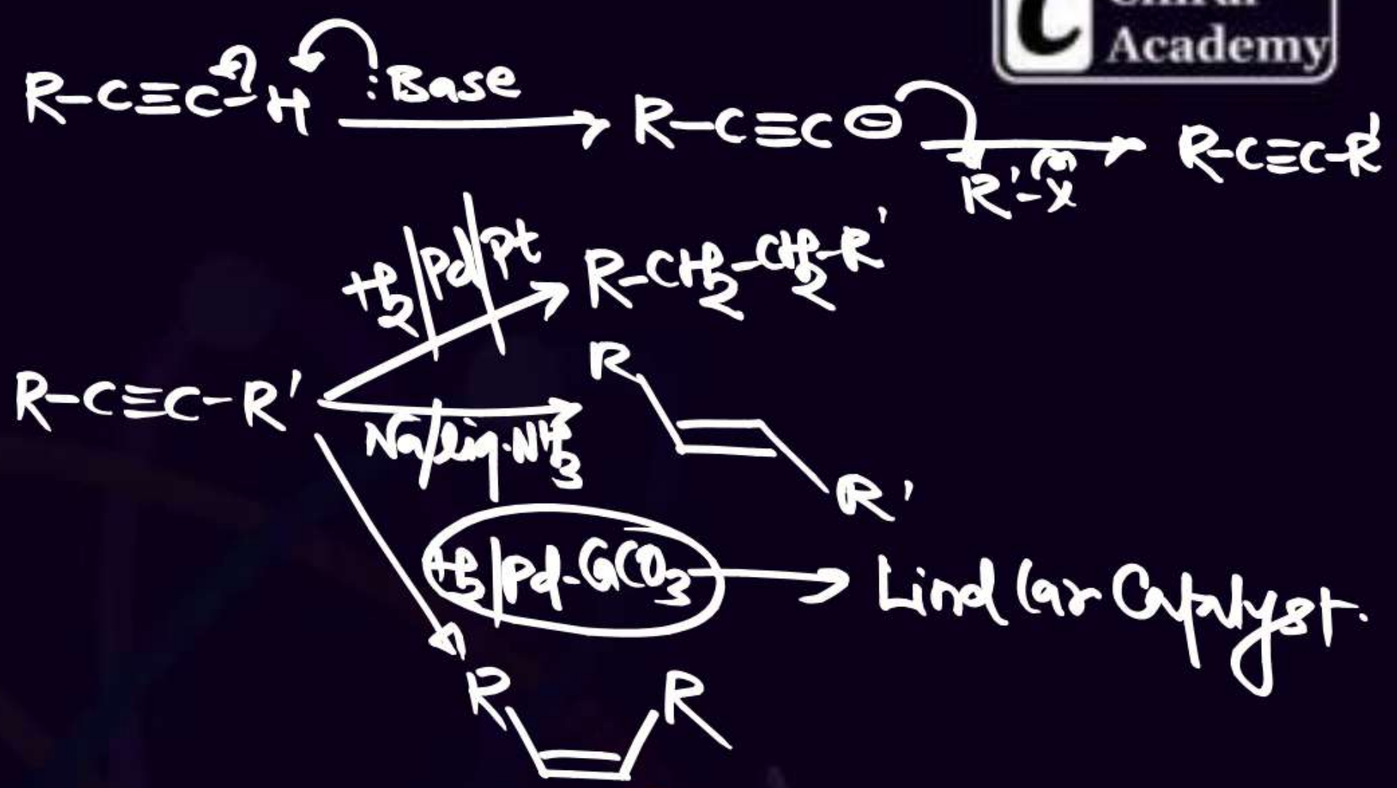
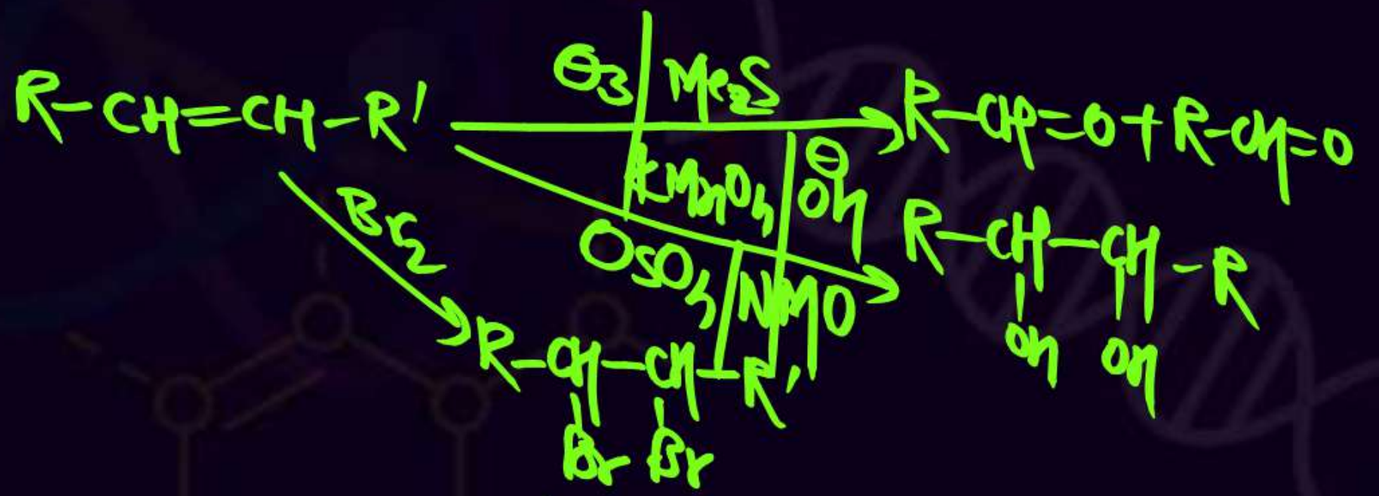
* Carbanion & It's Rxns







Introduction to Tautomerism

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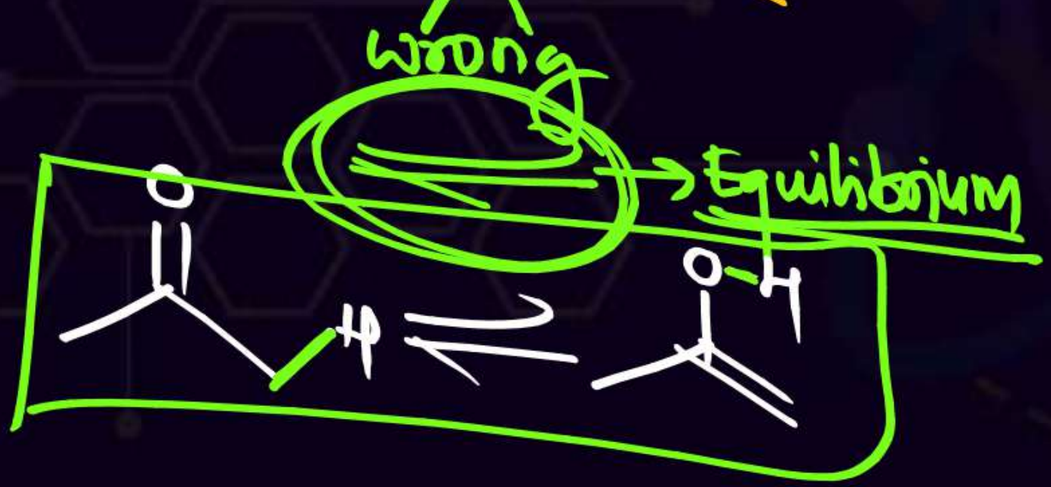
*** Resonance :-** Delocalization of $e^{\ominus}$'s in conjugated system.

→ Movement of $e^{\ominus}$s
→ movement of π-Bond / π-$e^{\ominus}$s

→ Shifting of atom is not possible

← Not Resonance



Shifting of atom (H) & Shifting of π-Bond

→ Tautomerism

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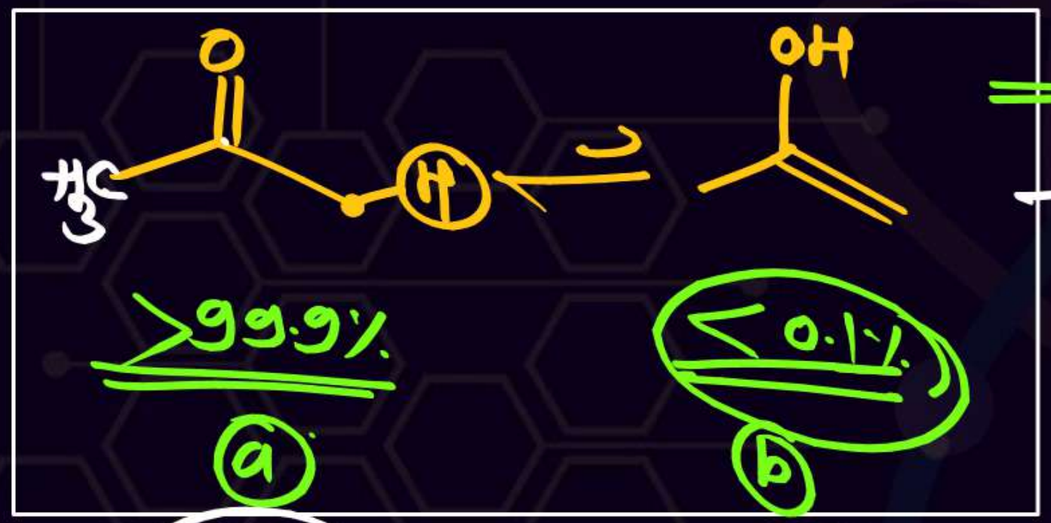
Resonance



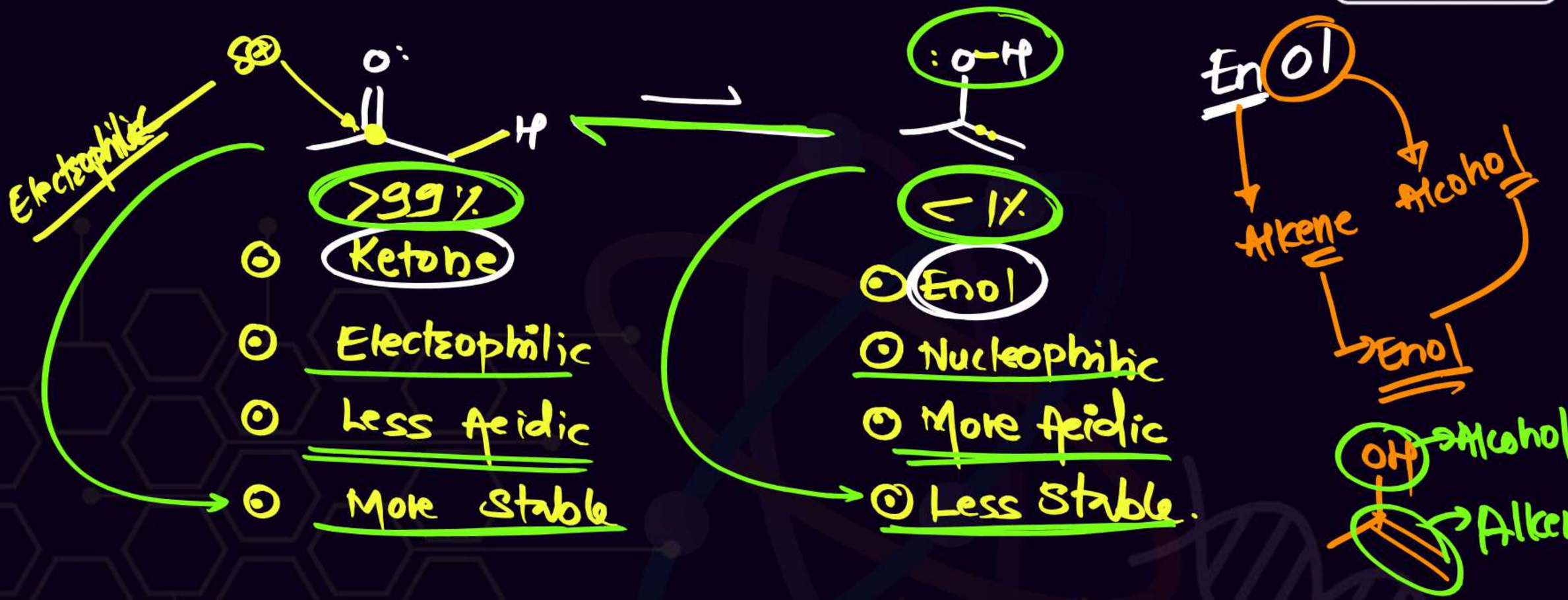
⇒ Tautomerism

→ constitutional isomers

Atom to Atom connectivity

→ Same ⇒ Stereoisomers.

→ Different ⇒ constitutional isomer.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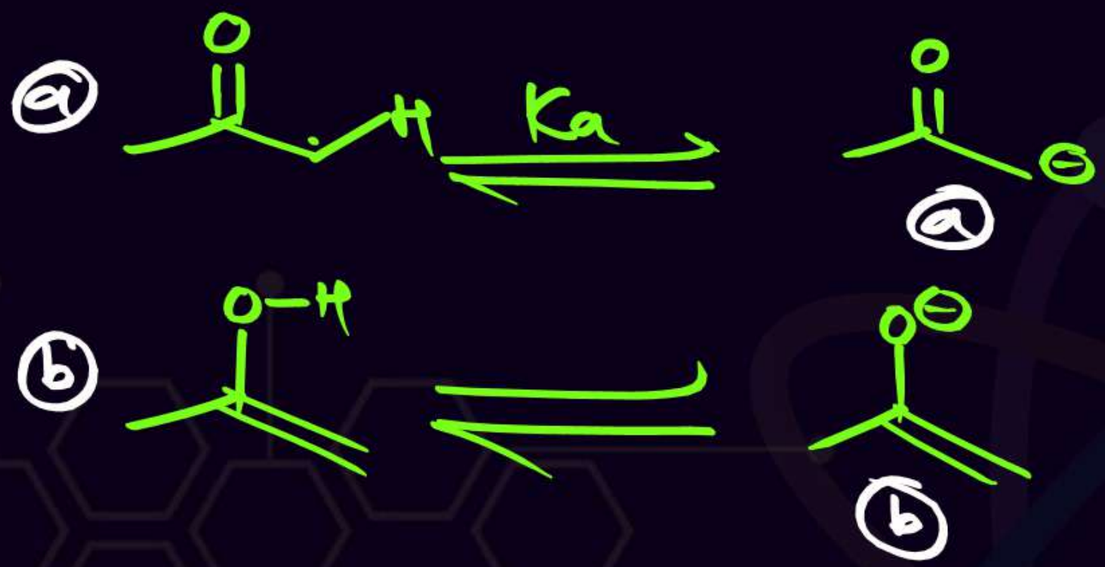
Electrophile
>99%
Ketone
Electrophilic
Less Acidic
More Stable
<1%
Enol
Nucleophilic
More Acidic
Less Stable
Enol
Alkene
Alcohol
Enol
OH
Alcohol
Alkene

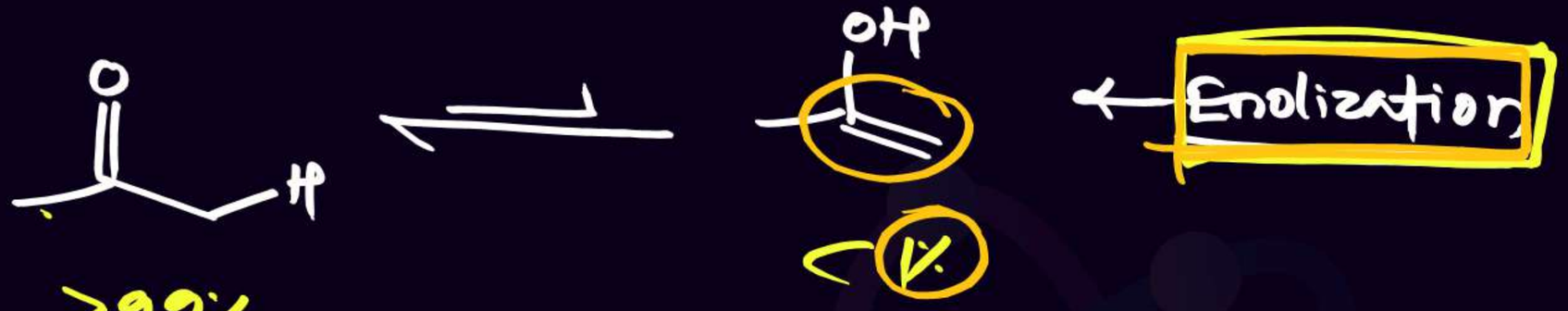
Acidity



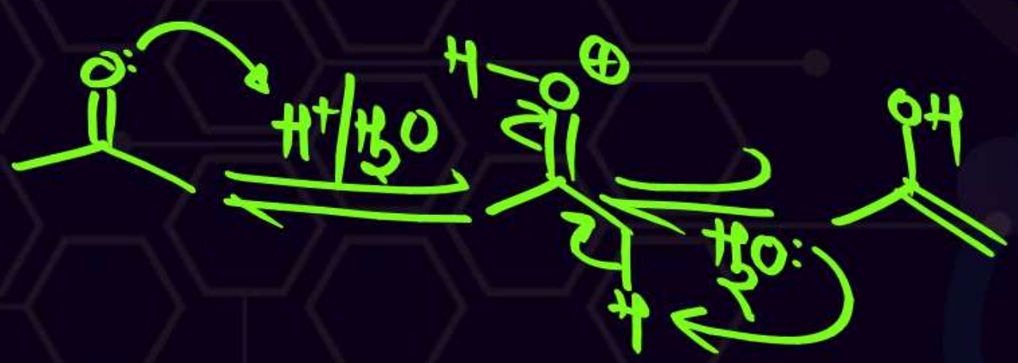
b > a

Stability of Anion = b > a

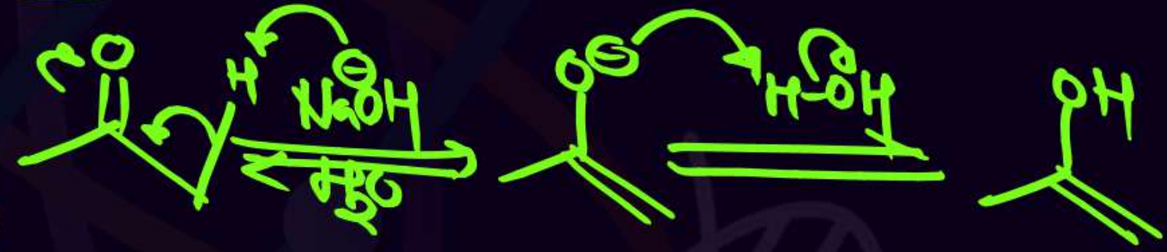
Enolization :-



Acidic condition



Basic condition



Condition for Tautomerism

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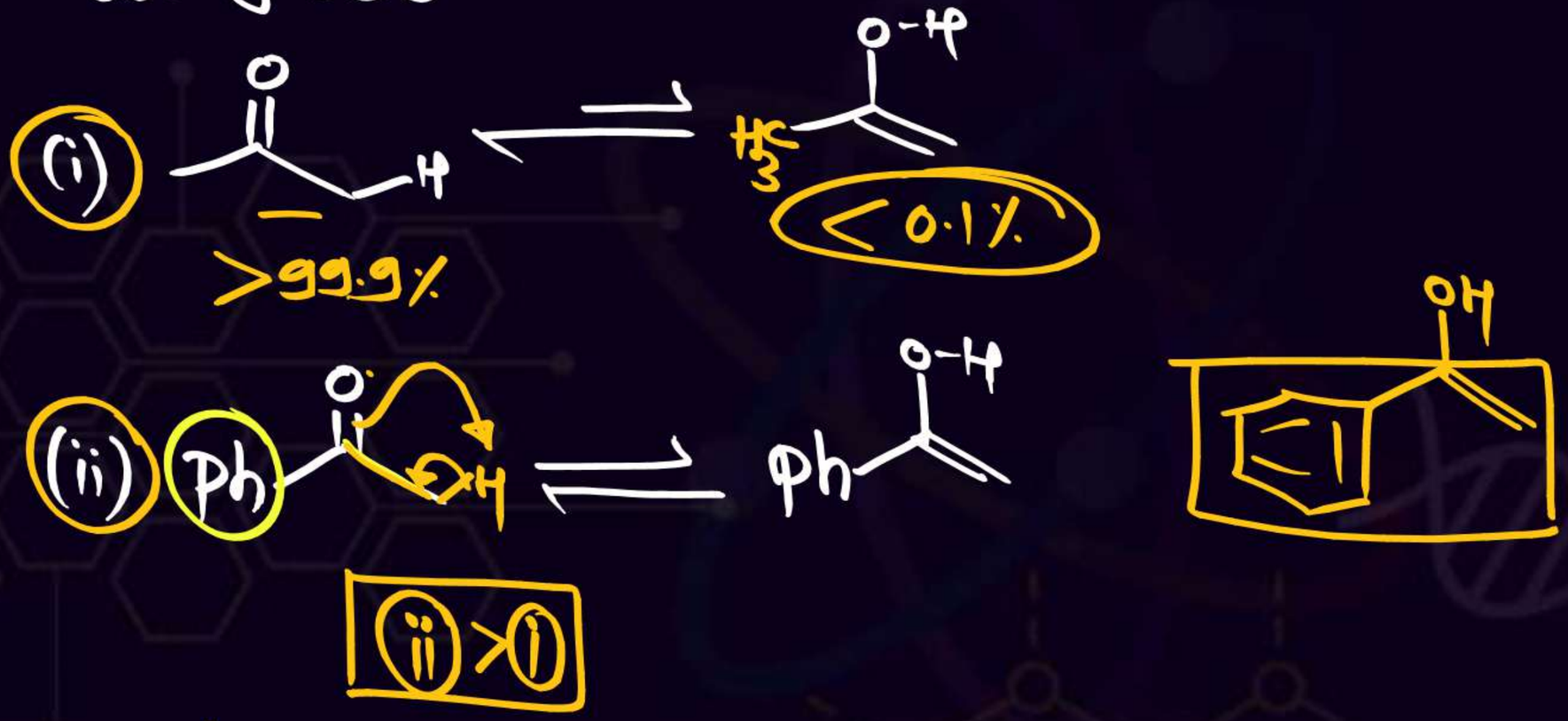
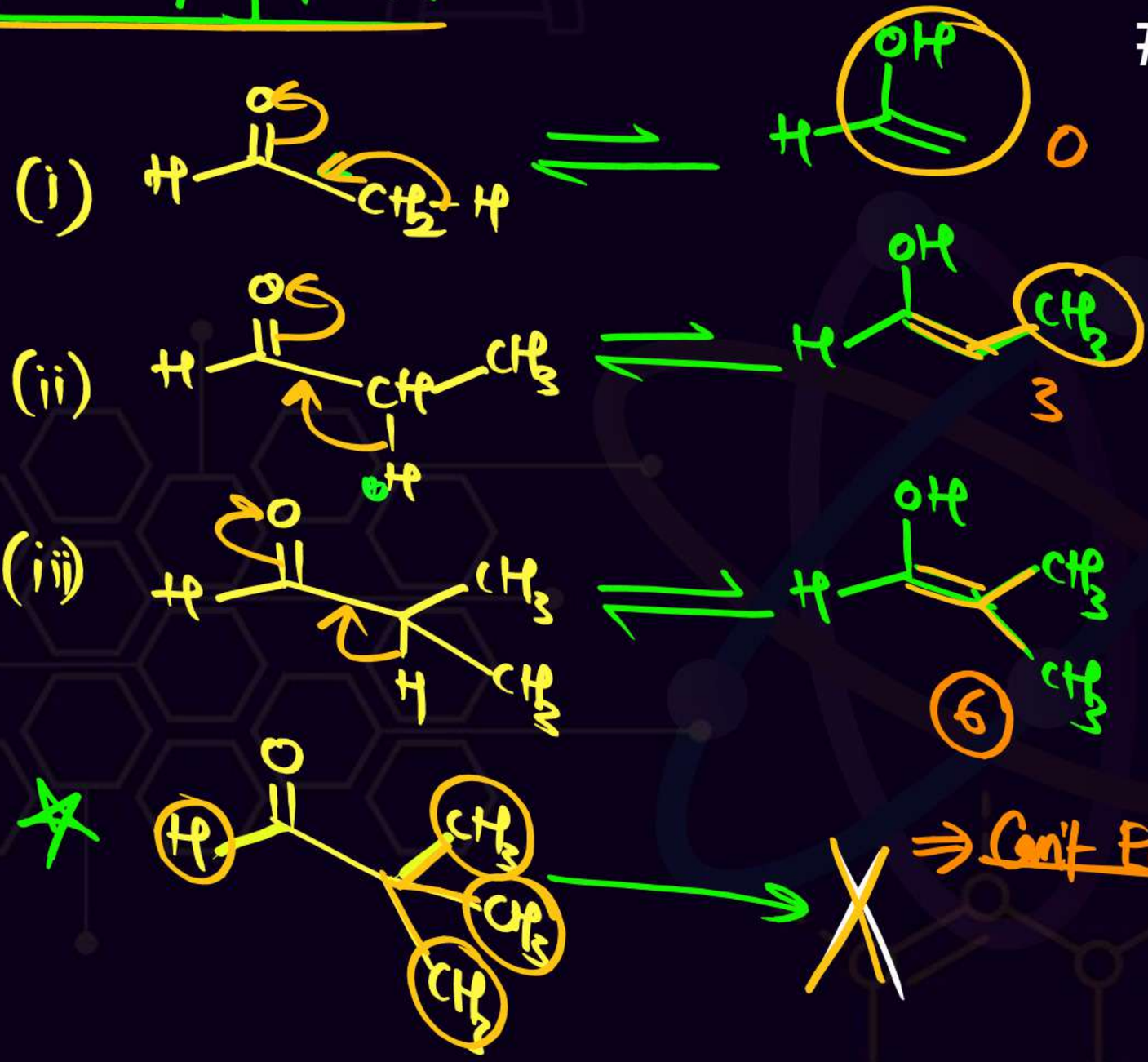
① conjugation :-



② Hyperconjugation :-



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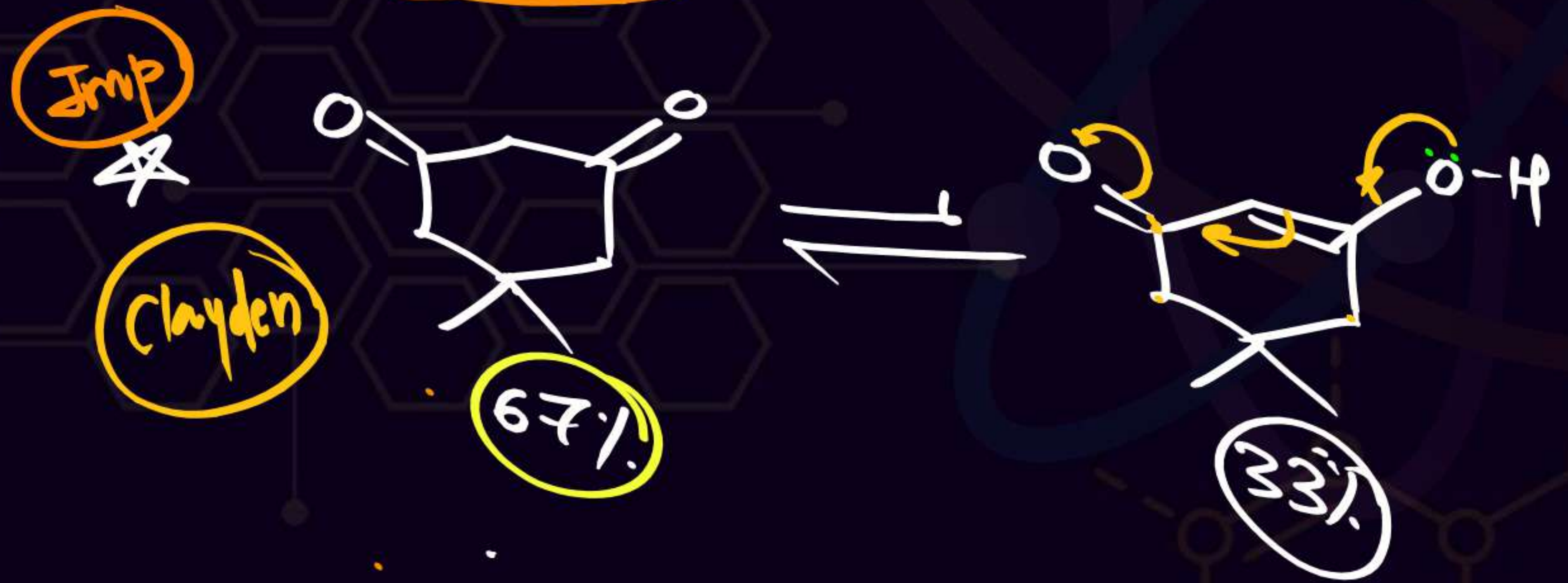
#Q Rate of Enolization ?

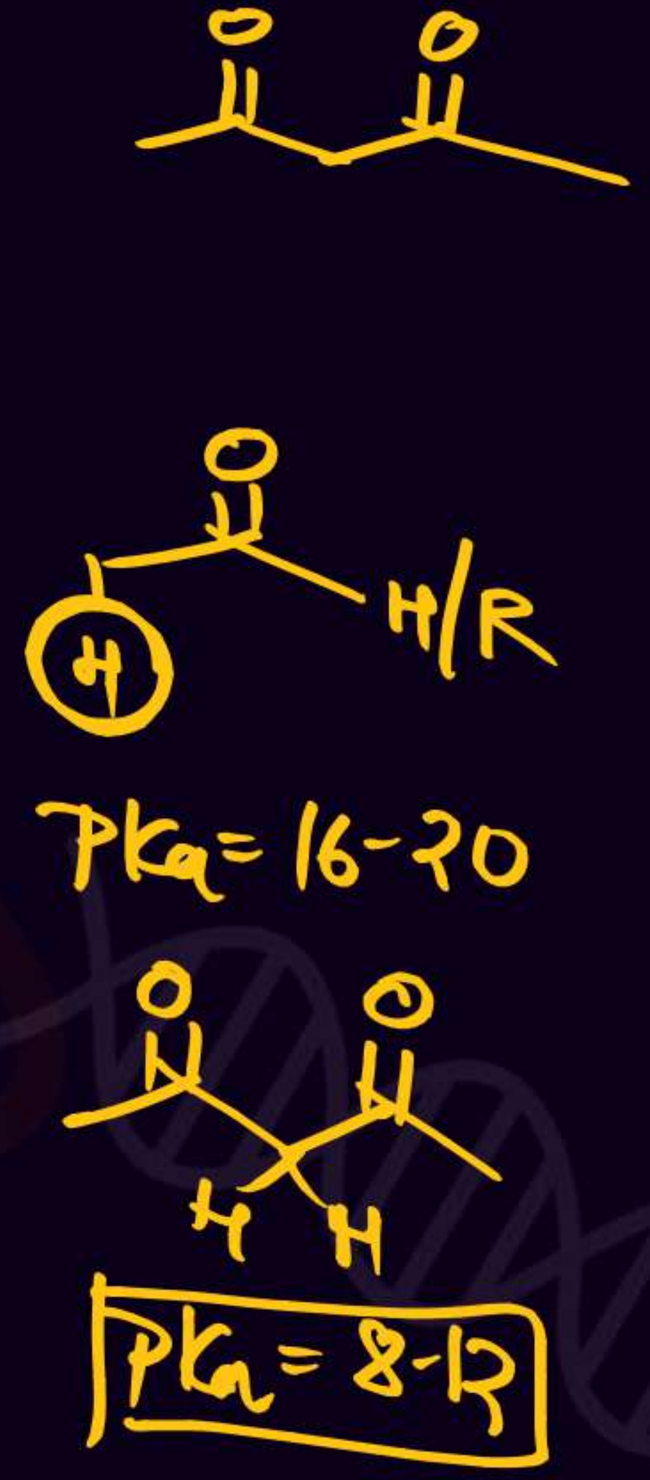
Stability of Alkene ∝ No. of ∝ Hydrogens

(iii) > (ii) > (i)

⇒ Can't Enolize

③ Intramolecular Hydrogen Bonding





Examples and Question

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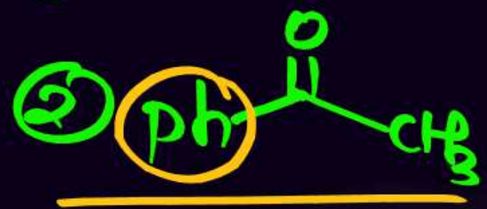
Arrange following in increasing order of enol form ?



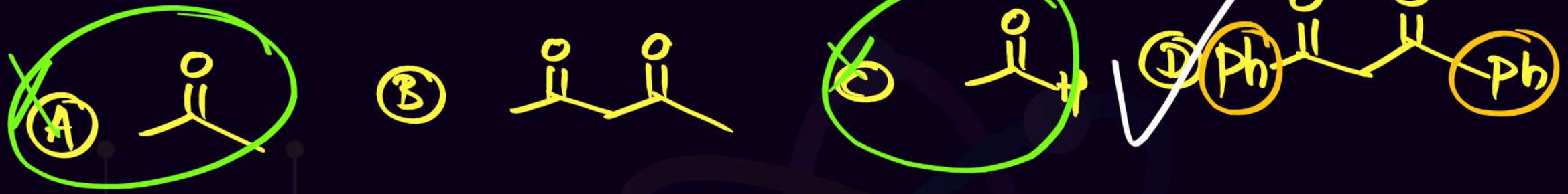
(A) ~~(A)~~ ① > ② > ③ > ④

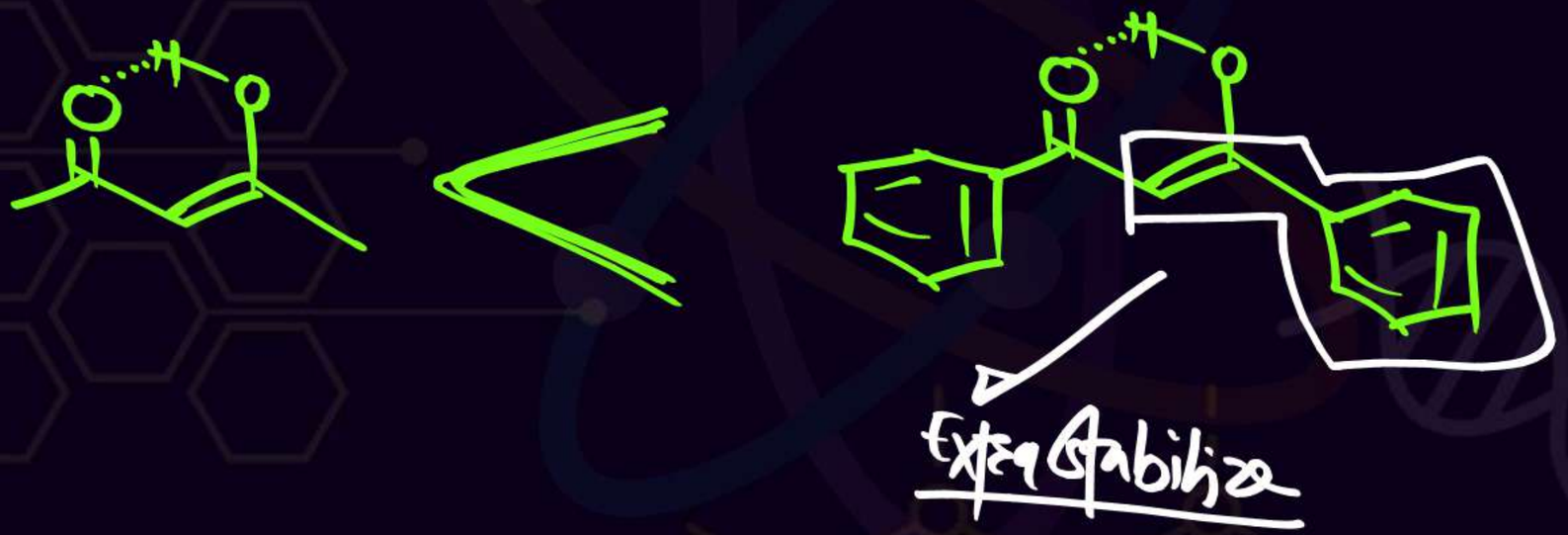
(B) ~~(B)~~ ③ > ④ > ① > ②

(C) ~~(C)~~ ④ > ③ > ② > ①

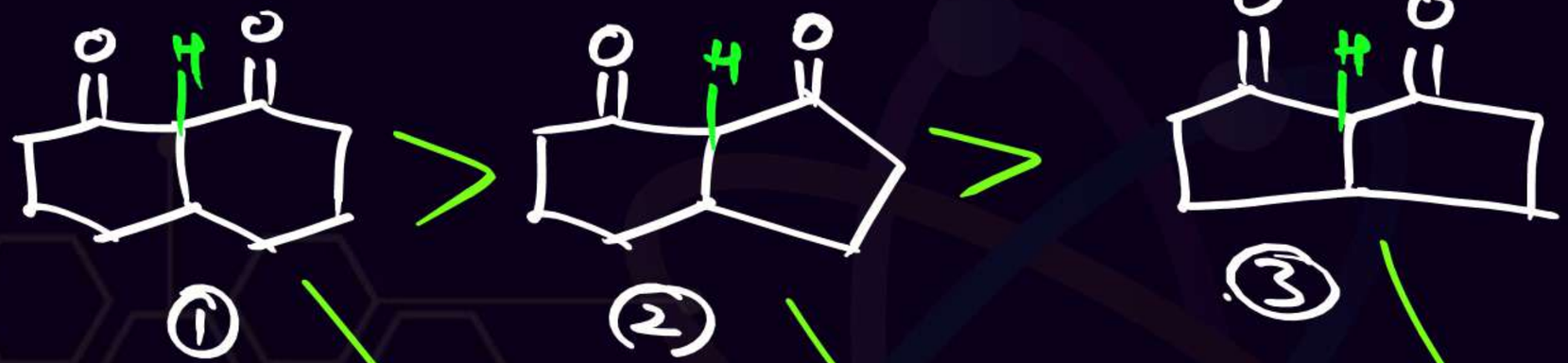
(D) ✓ ③ > ④ > ② > ①

Q Maximum Enol content is in :





#Q The correct order of enol content in following molecules.



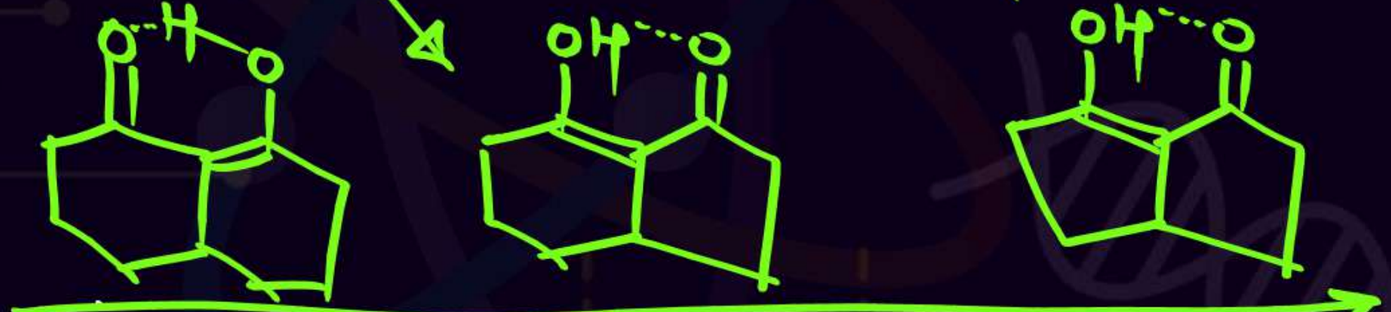
(1) (2) (3)

(A) (1) > (2) > (3)

(B) (3) > (2) > (1)

(C) (2) > (3) > (1)

(D) (2) > (1) > (3)



(Stearin ↑ses, Enol content ↓ses.

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#Q Which of the following has unstable enol form?

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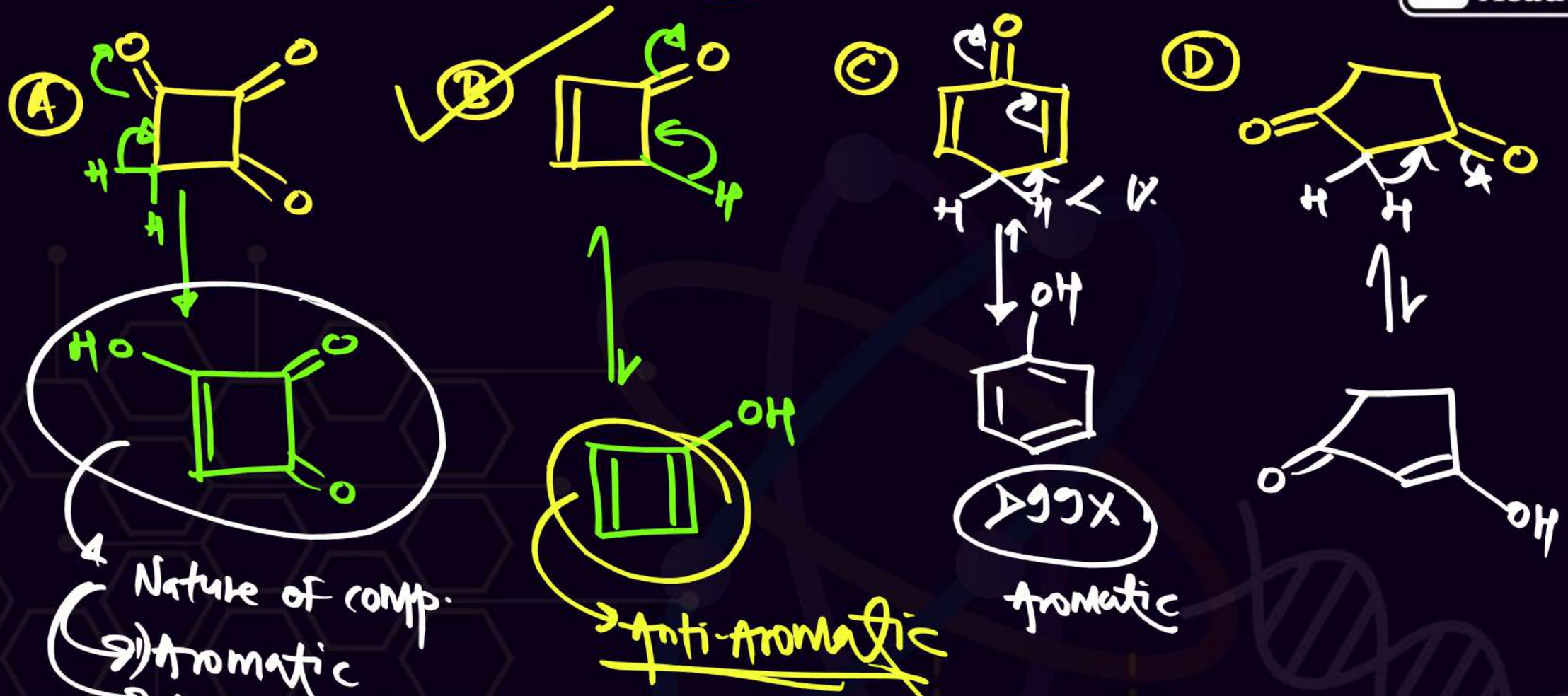
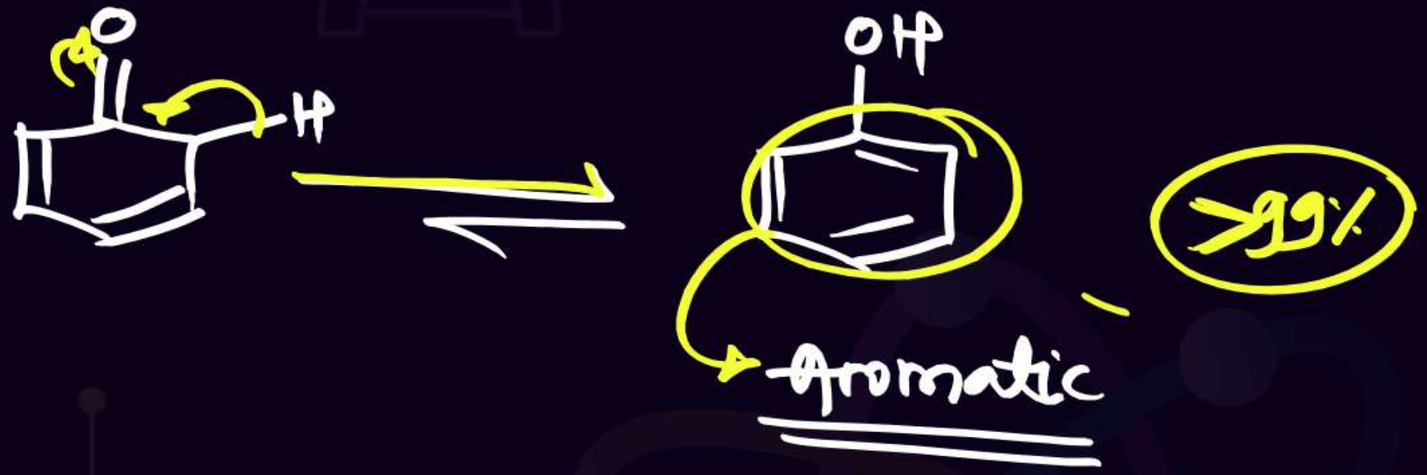
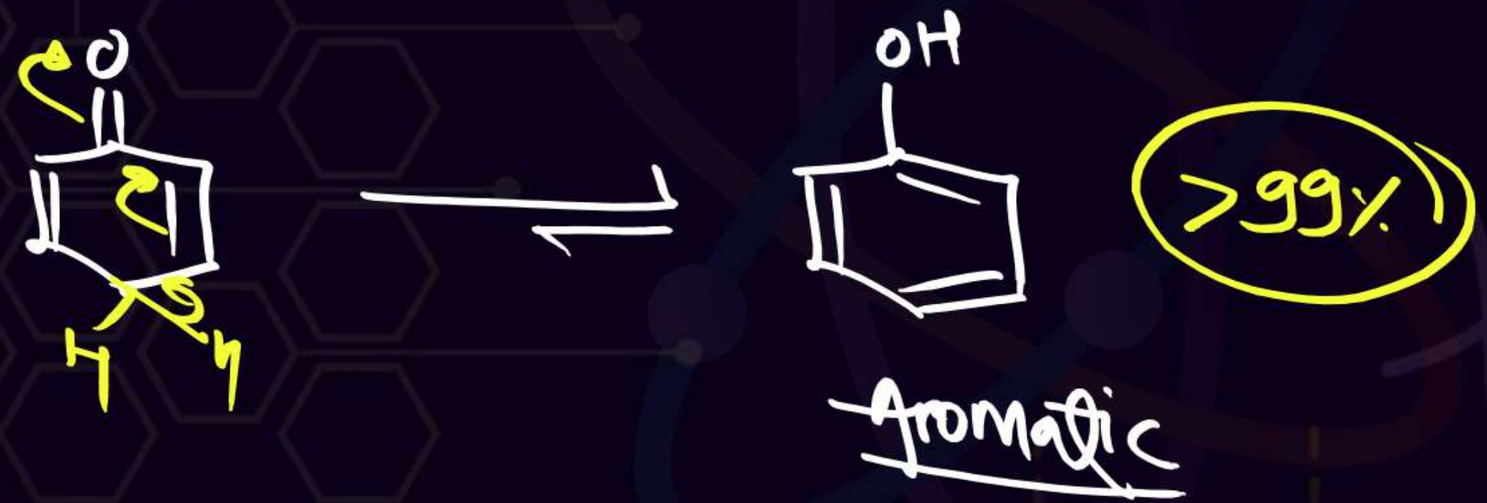


* Favour Enol form :-





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*EWG favour Enol Form:-

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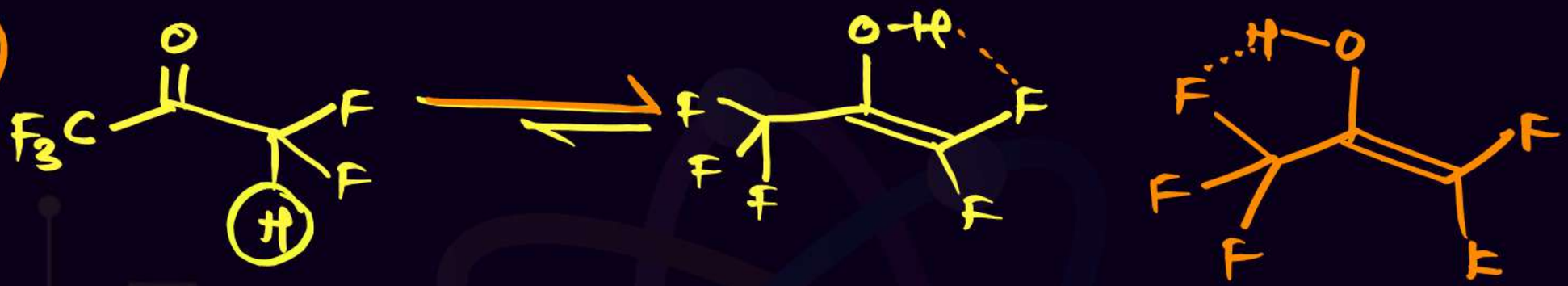

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✱ Effect of Temperature on % Enol :-

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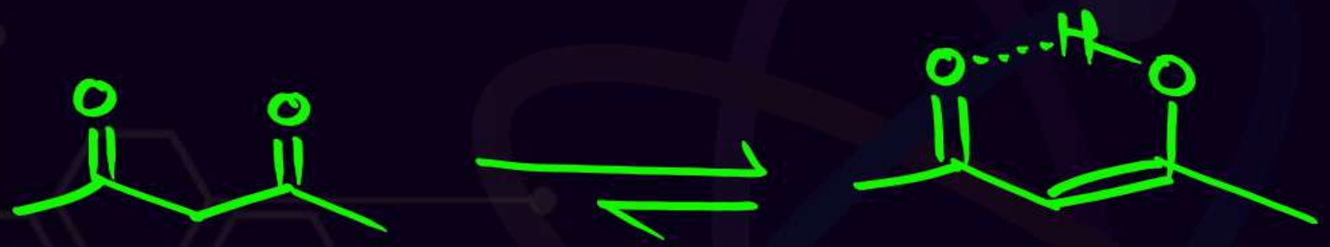
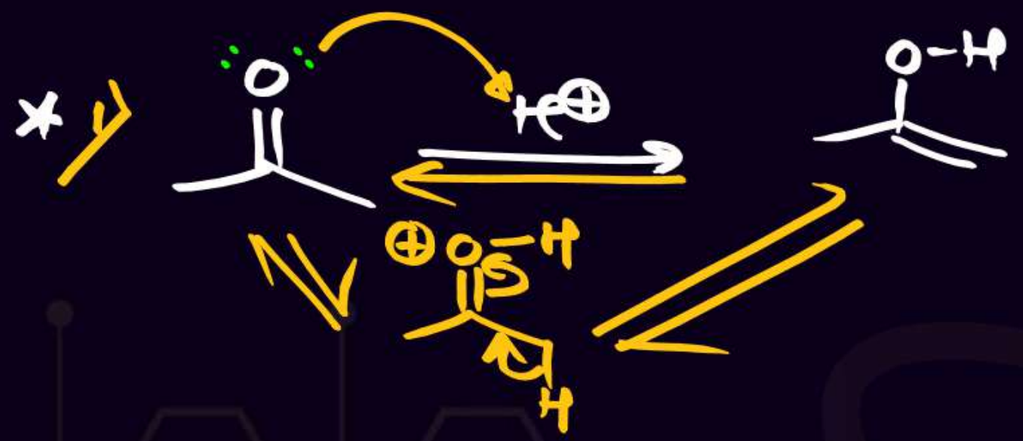
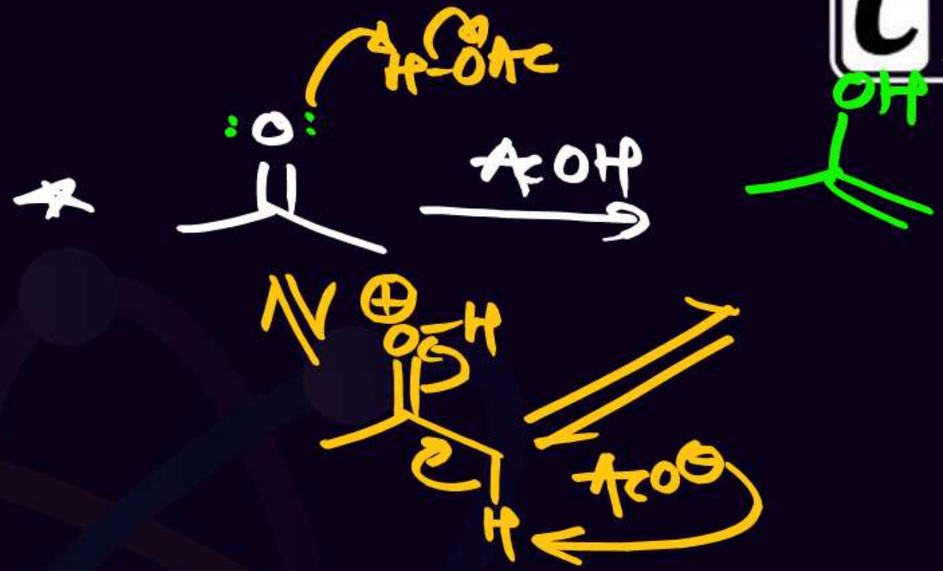
$$\text{Temperature} \propto \frac{1}{\%\ \text{Enol}}$$

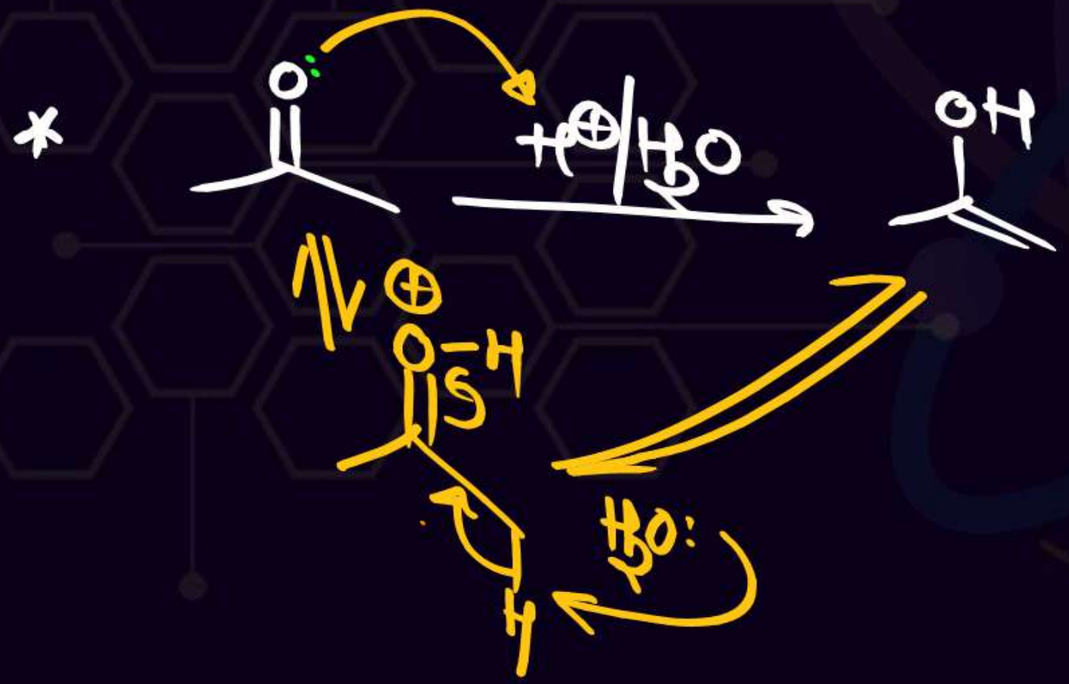


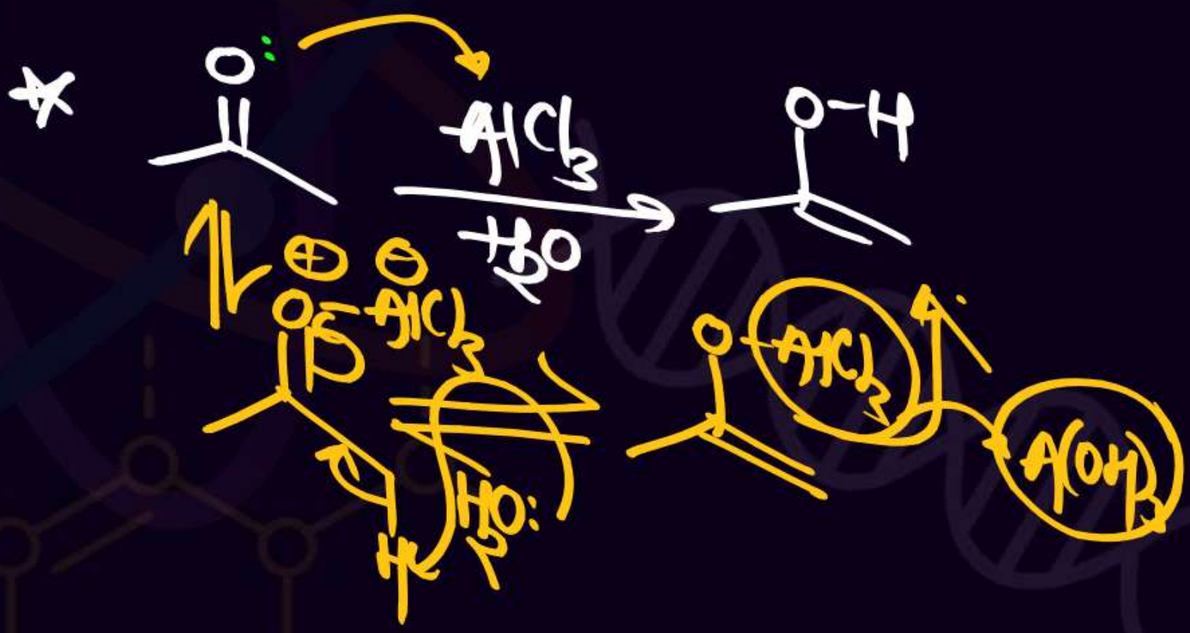
Temp. →	20 °C	180 °C	275 °C
% Enol	90%	62%	44%

* Acid Catalyzed Enolization :-

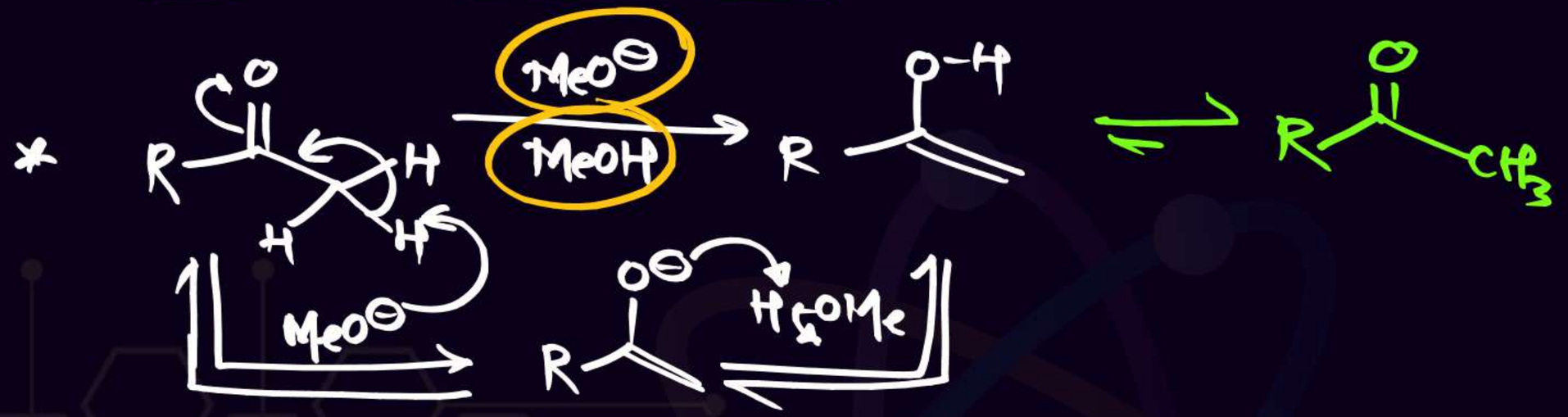


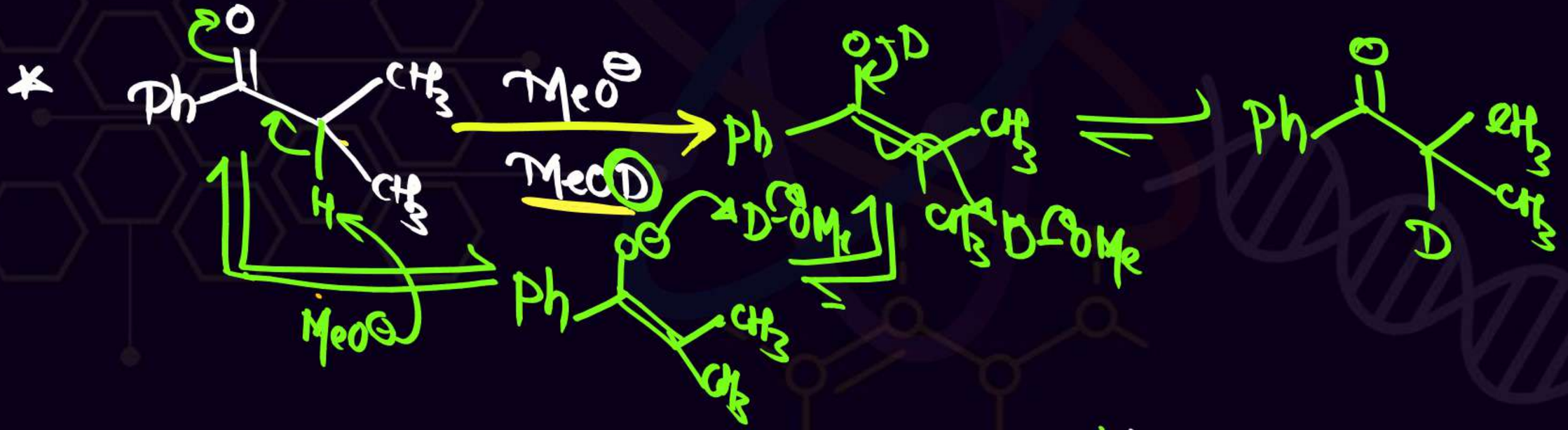






Base Catalyzed Enolation :-





#Q In following molecule which Hydrogens will not show Deuterium exchange when reaction with $CH_3-O^{\ominus}$ / CH_2-OD ?

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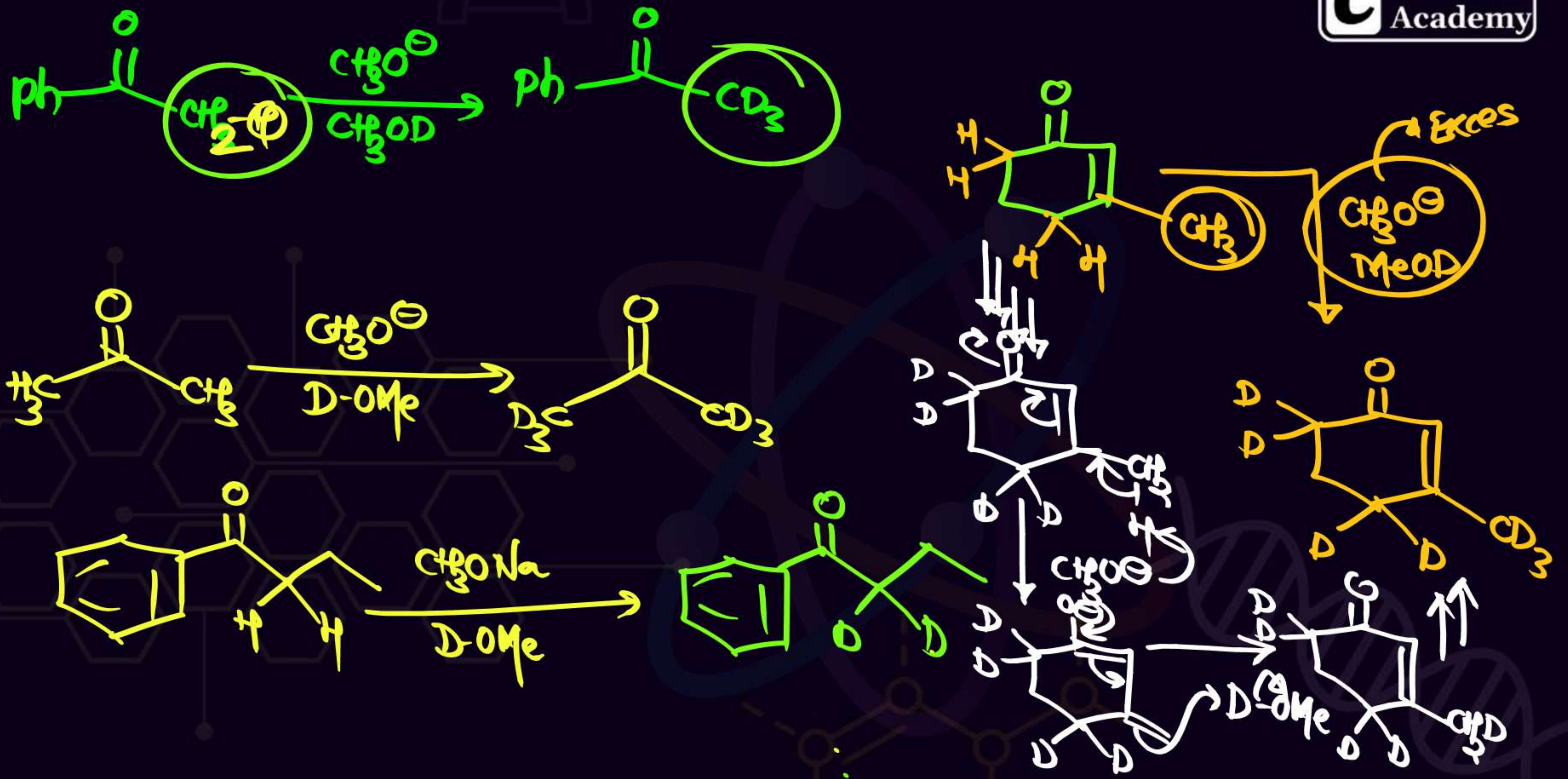
(1) H1 & H3

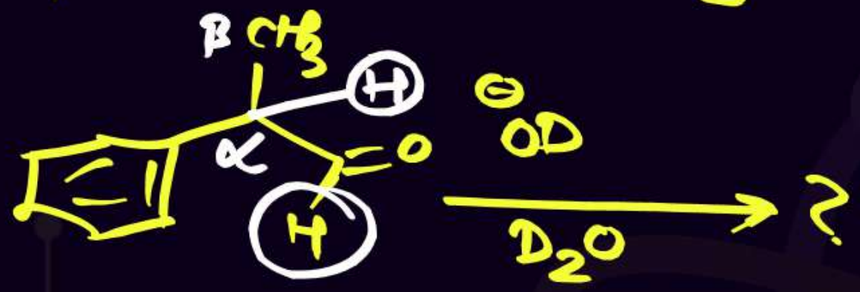
(2) H4 & H5

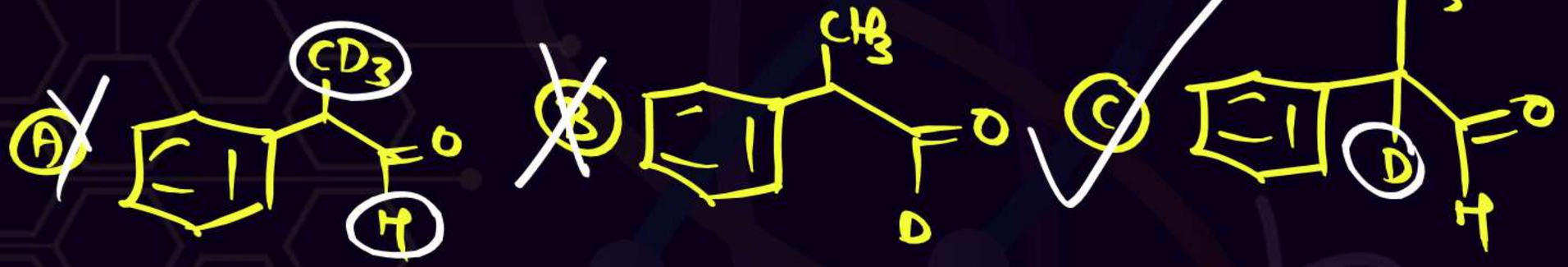
(3) H1 & H4

(4) H3 & H4



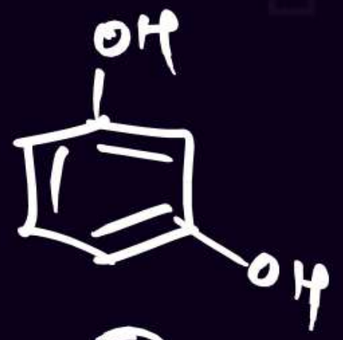
The product of following Rxn should be?



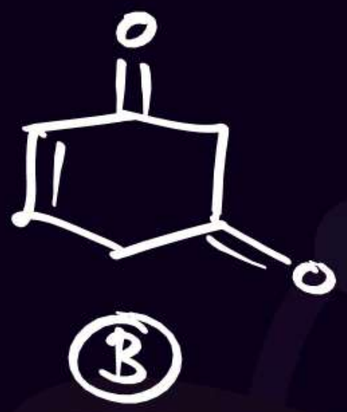


(D) None of these.

What will be relation of (A) & (B) _



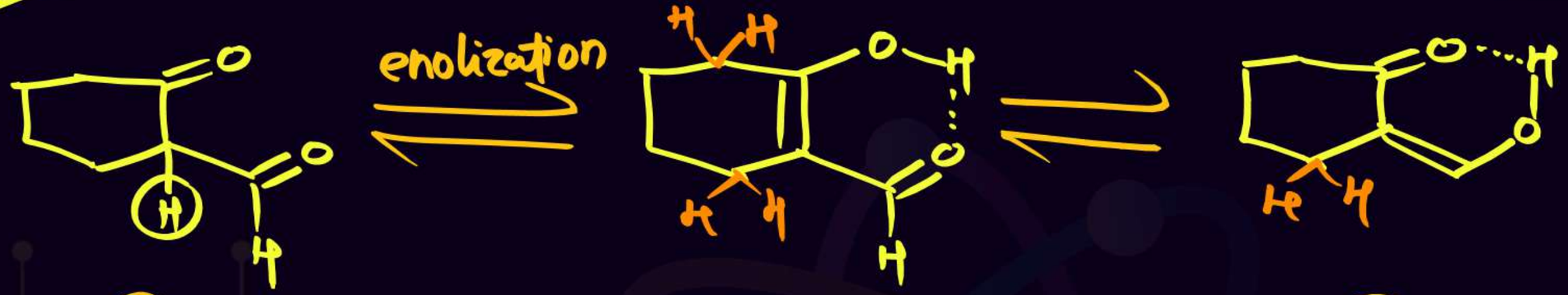
(A)



(B)

(1) Resonance structures.
(2) Functional isomers.
(3) Tautomers
(4) positional isomers

Clayden



(a) 0%

(b) 76%

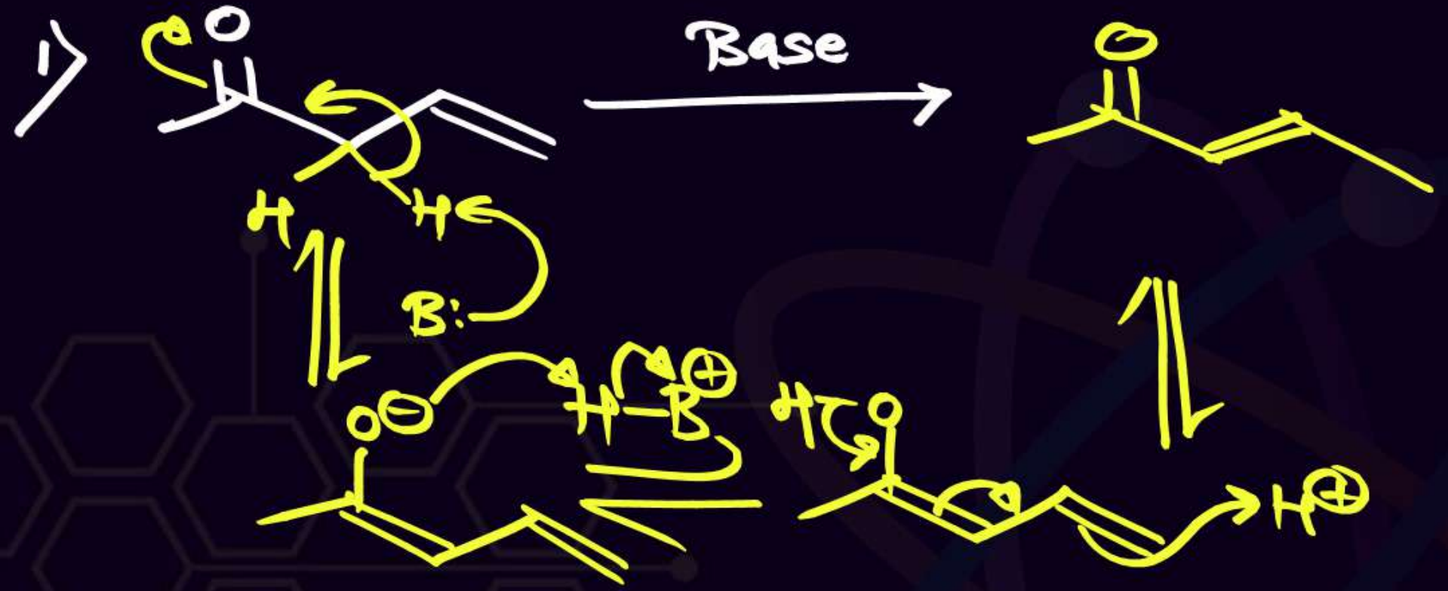
(c) 24%

% of enol content ?

1) a > b > c 3) c > b > a

2) a > c > b 4) b > c > a

* Consequences of Enolization :-



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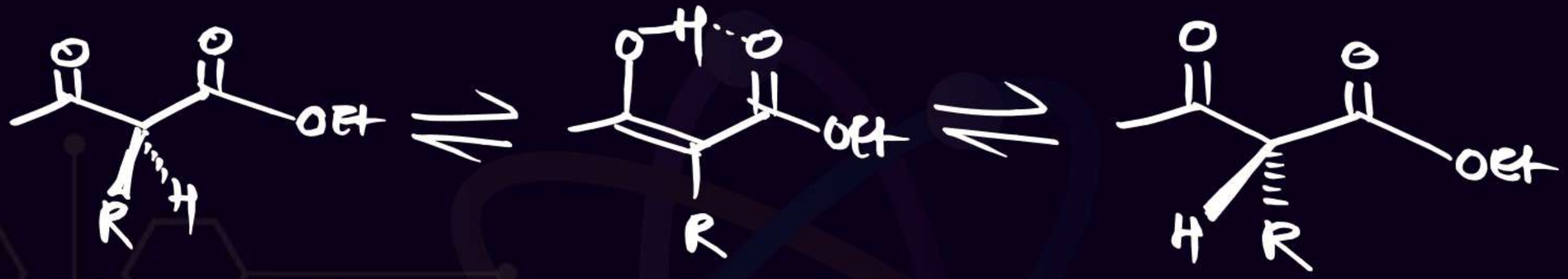
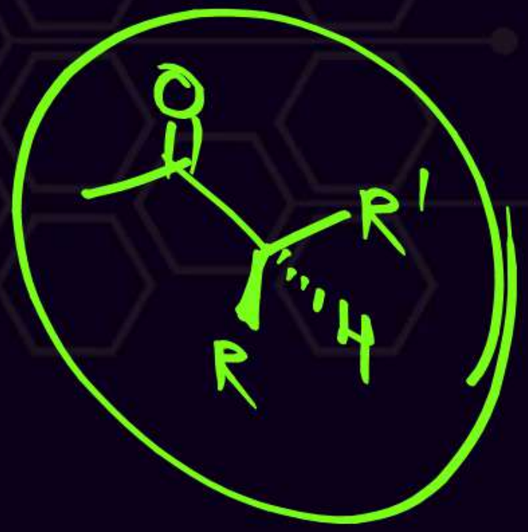
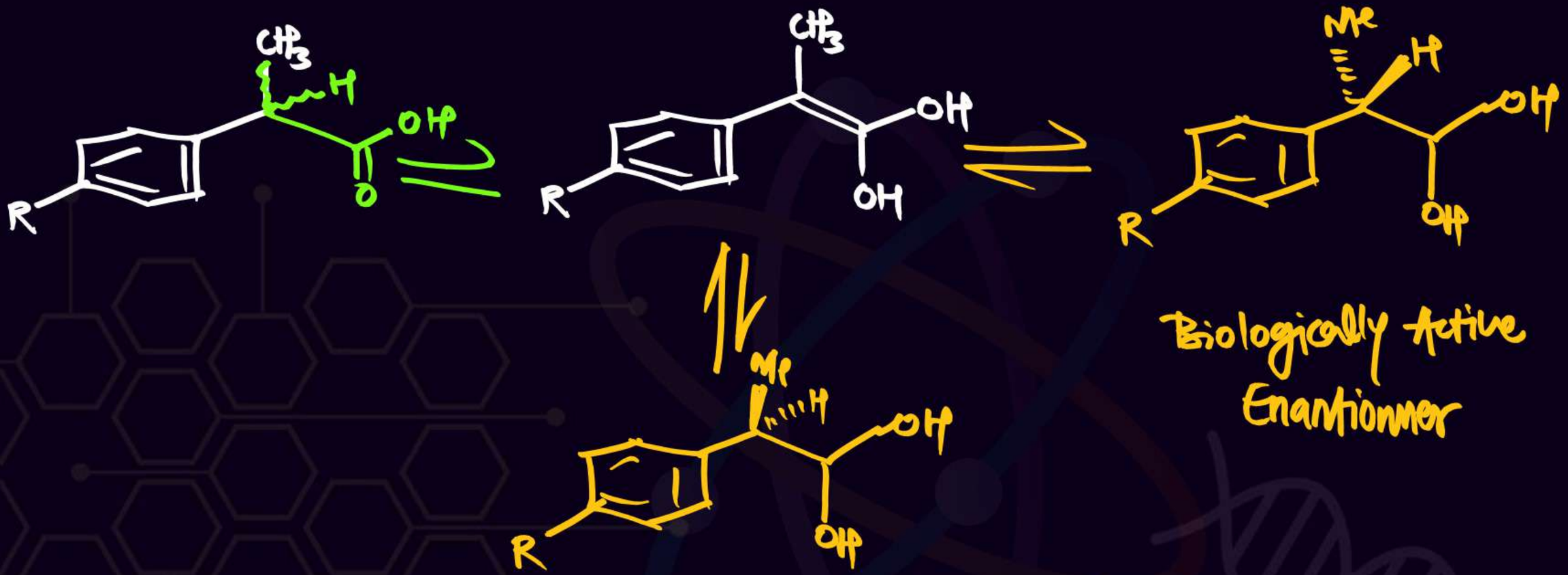
a) Racimization







Biologically Active Enantionmer

Biological Inactive Enantionmer

SUMMARY

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Thank you