

Grignard reagent

Properties :

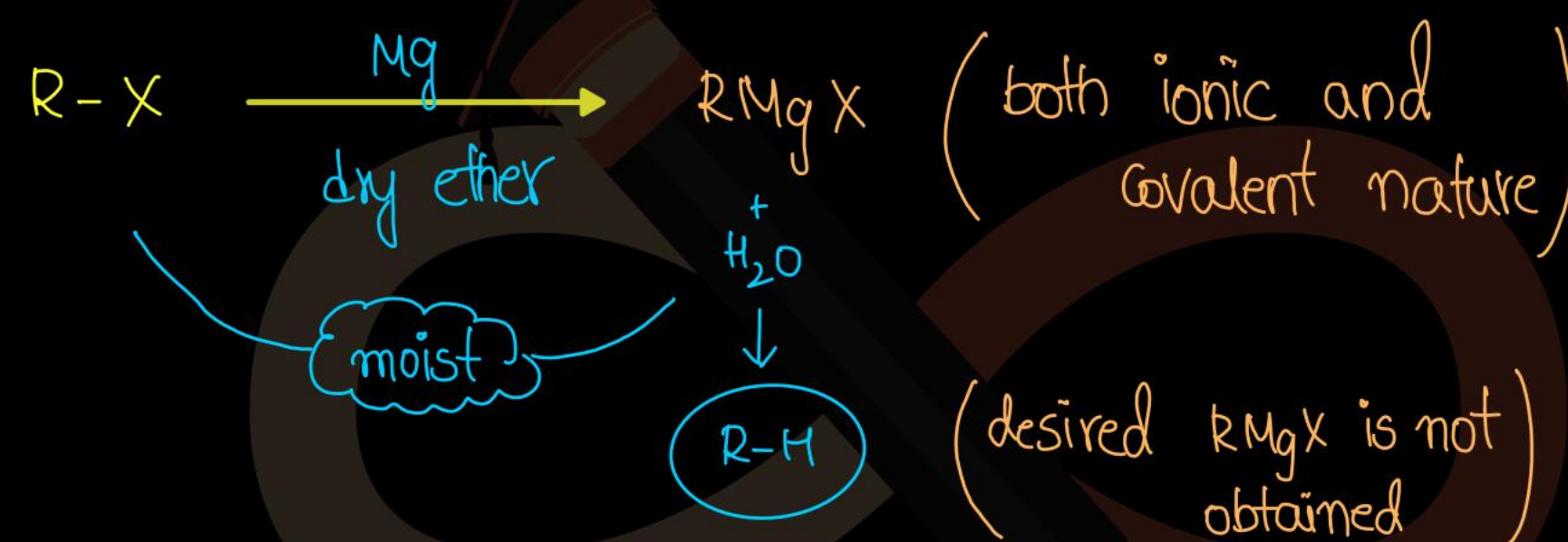
- 1) Zerewitinoff's rxn▶ 4
- 2) NAR▶ 6
- 3) SNAE▶ 8
- 4) SN_2 ▶ 12
- * Reactivity order▶ 9
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- 5) Rxn with Cyclic ethers▶ 14
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- 10) Rxn with Oxy & Sulphur▶ 18
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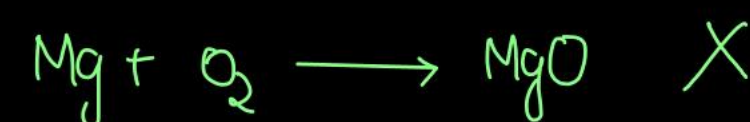
Grignard reagent

* Organo mettalic compound : Metal is directly bonded to 'Carbon'.
 a) Ionic b) Covalent

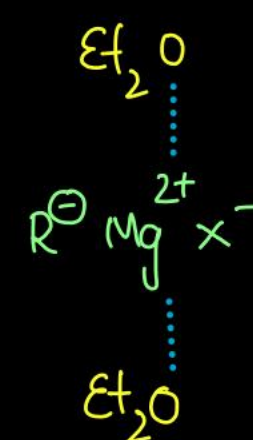
MDP :-



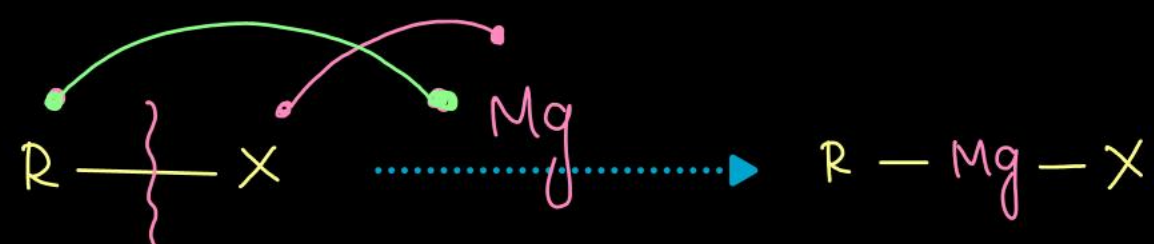
Ether: 1) To avoid Mg oxidise in air



2) Solvates the product

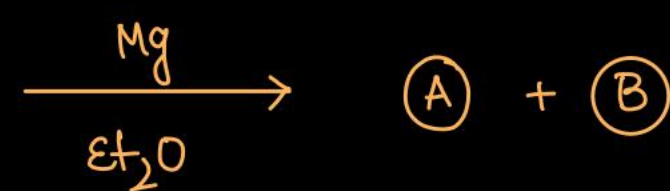
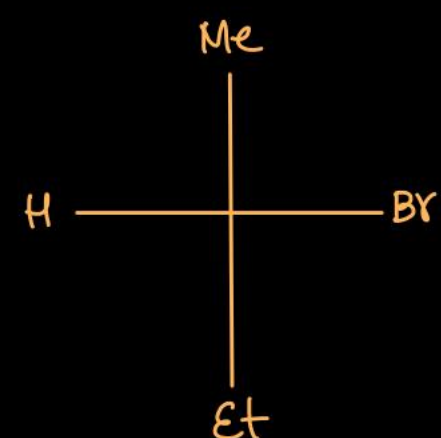


Mechanism :

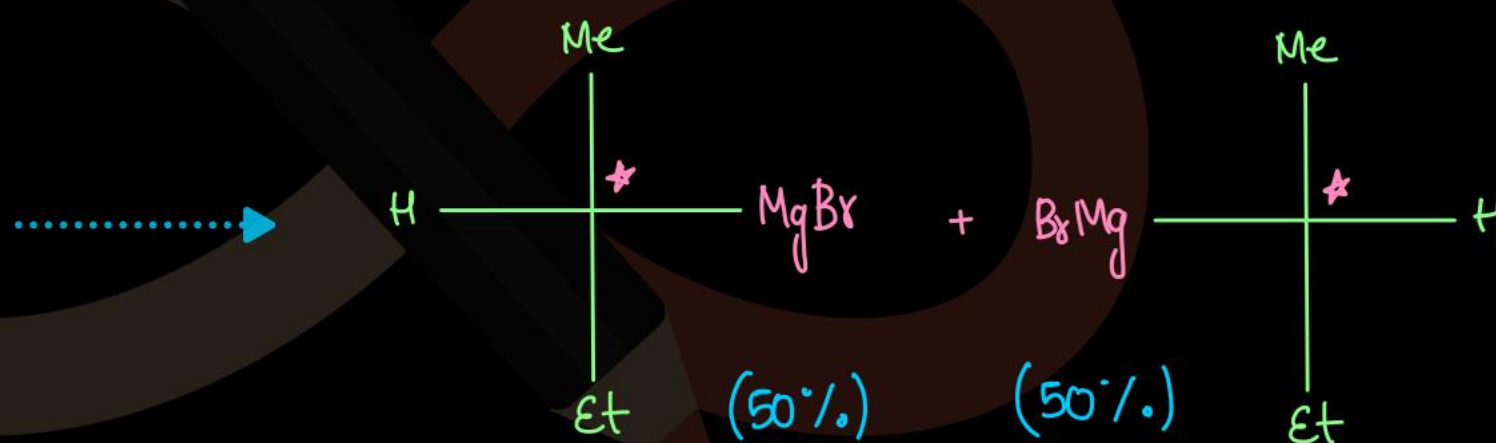
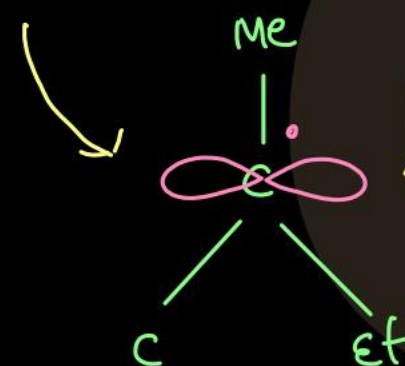
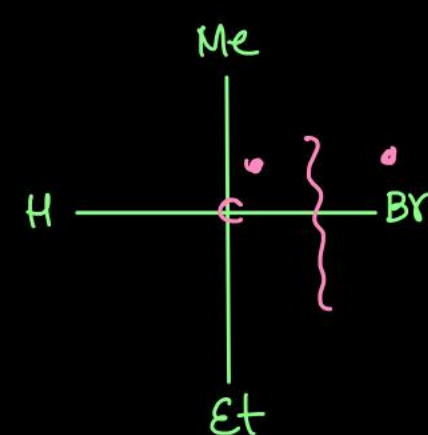


R.O.P :- $R-I > R-Br > R-Cl > R-F$

Q)

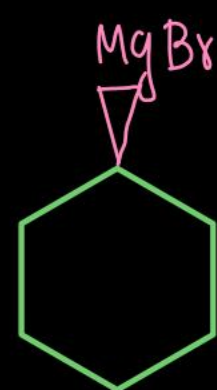
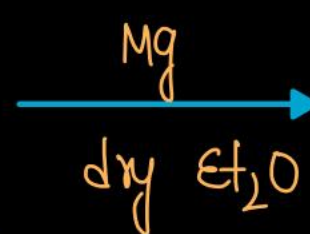
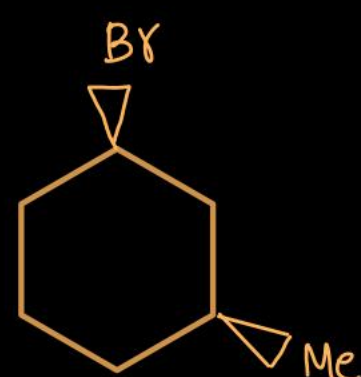


What is the relation between A & B ?

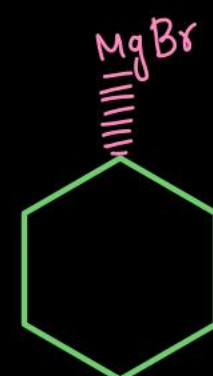


enantiomers
(racemic mixture)

Q)



+



diastereomers

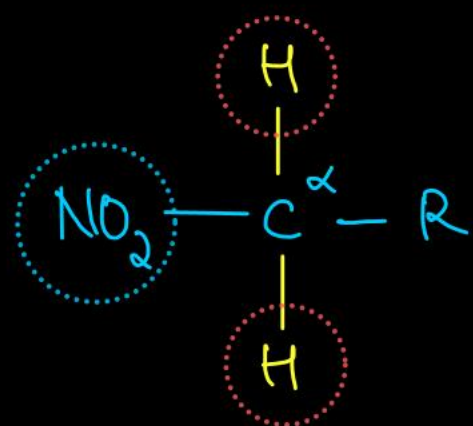
Properties :-

1) Zerewitinoff's Rxn for Estimation of active 'H'.

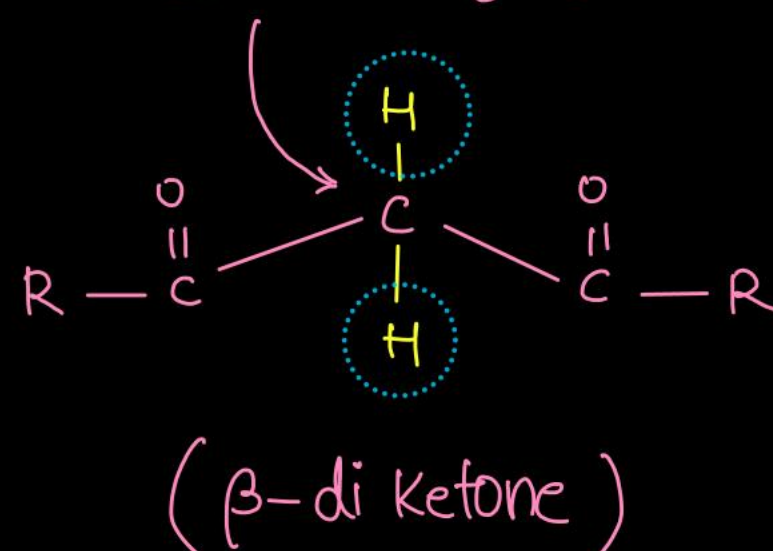
NAONS Q HX

N	A	C	O	N	S	Q	HX
Nitro alkane	Active methylene	terminal alkyne	Oxygen	Nitrogen	Sulphur	Quasi Aromatic	Halogen Hydride

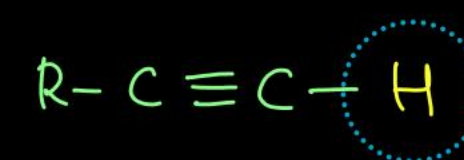
i) Nitro alkanes



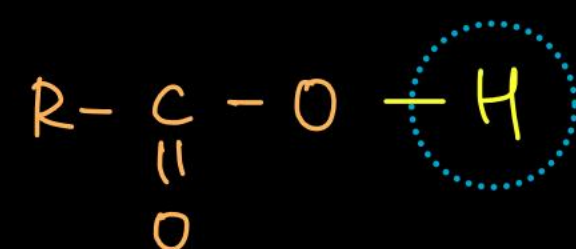
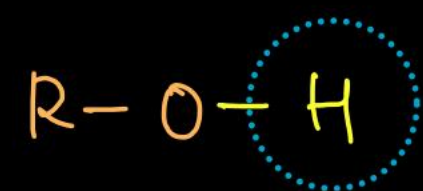
ii) active methylene :-



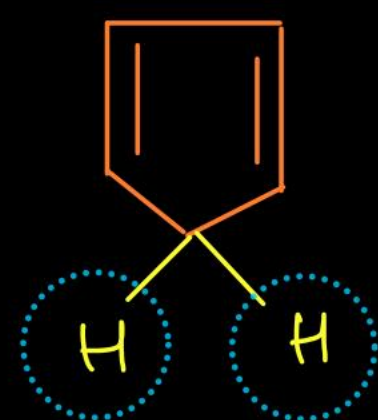
iii) terminal alkyne



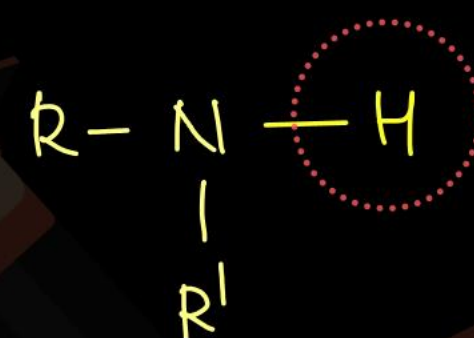
iv) Oxygen



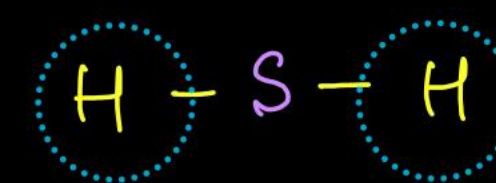
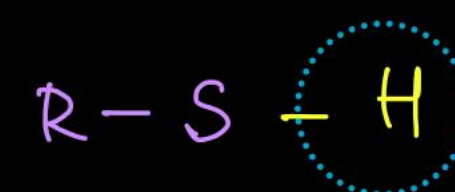
vii) Quasi aromatic



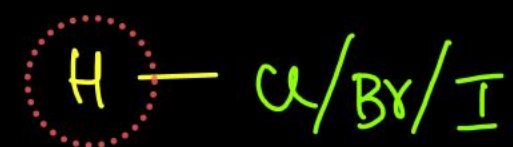
v) Nitrogen



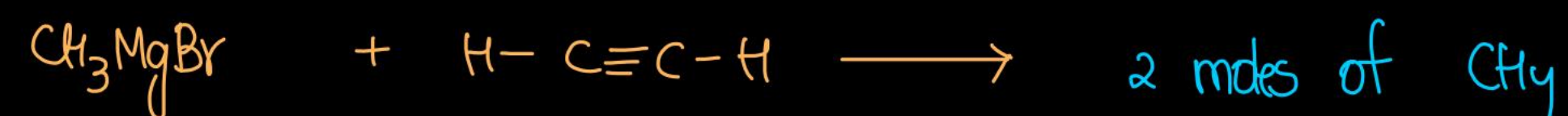
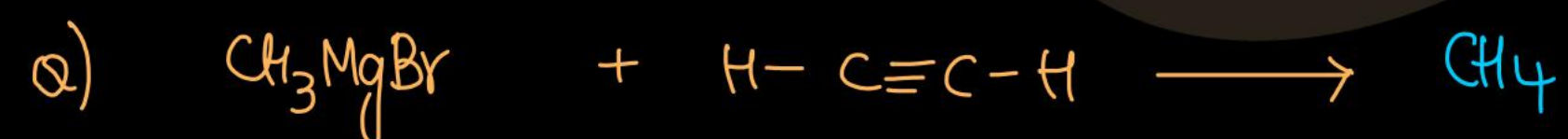
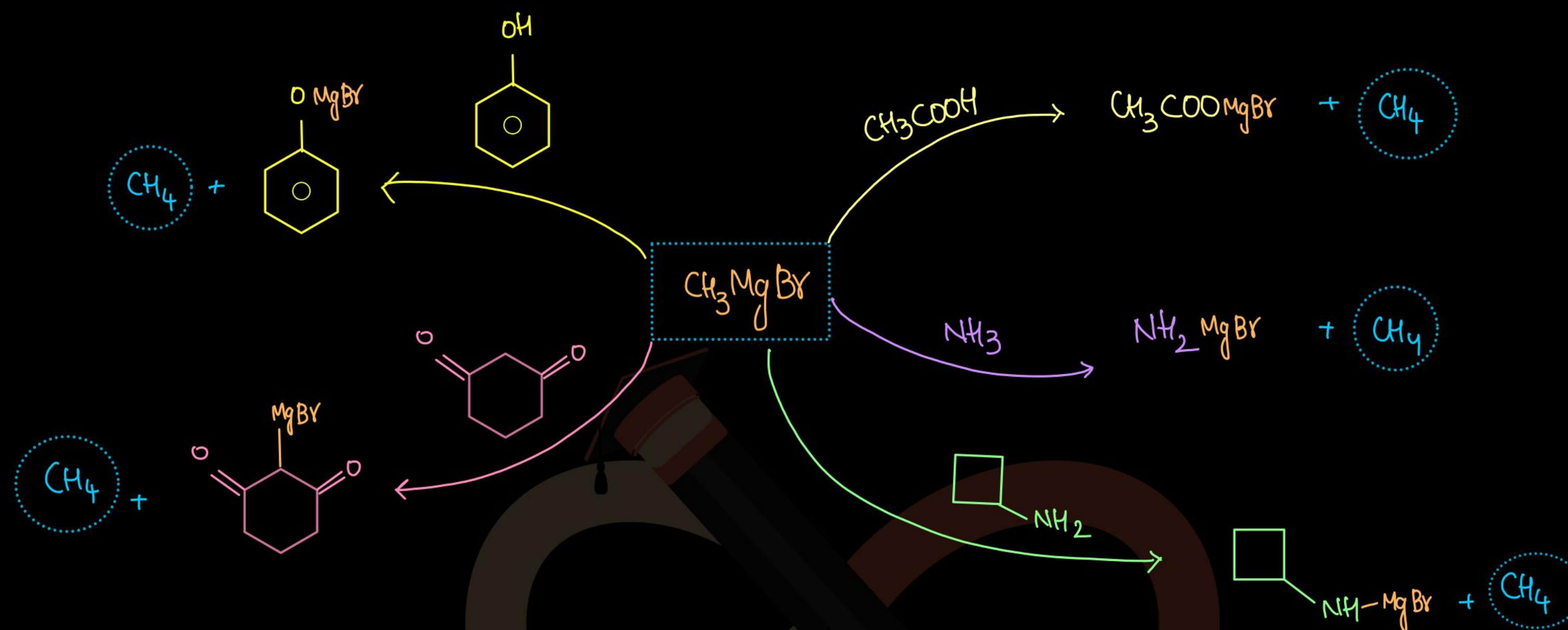
vi) Sulphur



viii) Halogen hydride :



2)

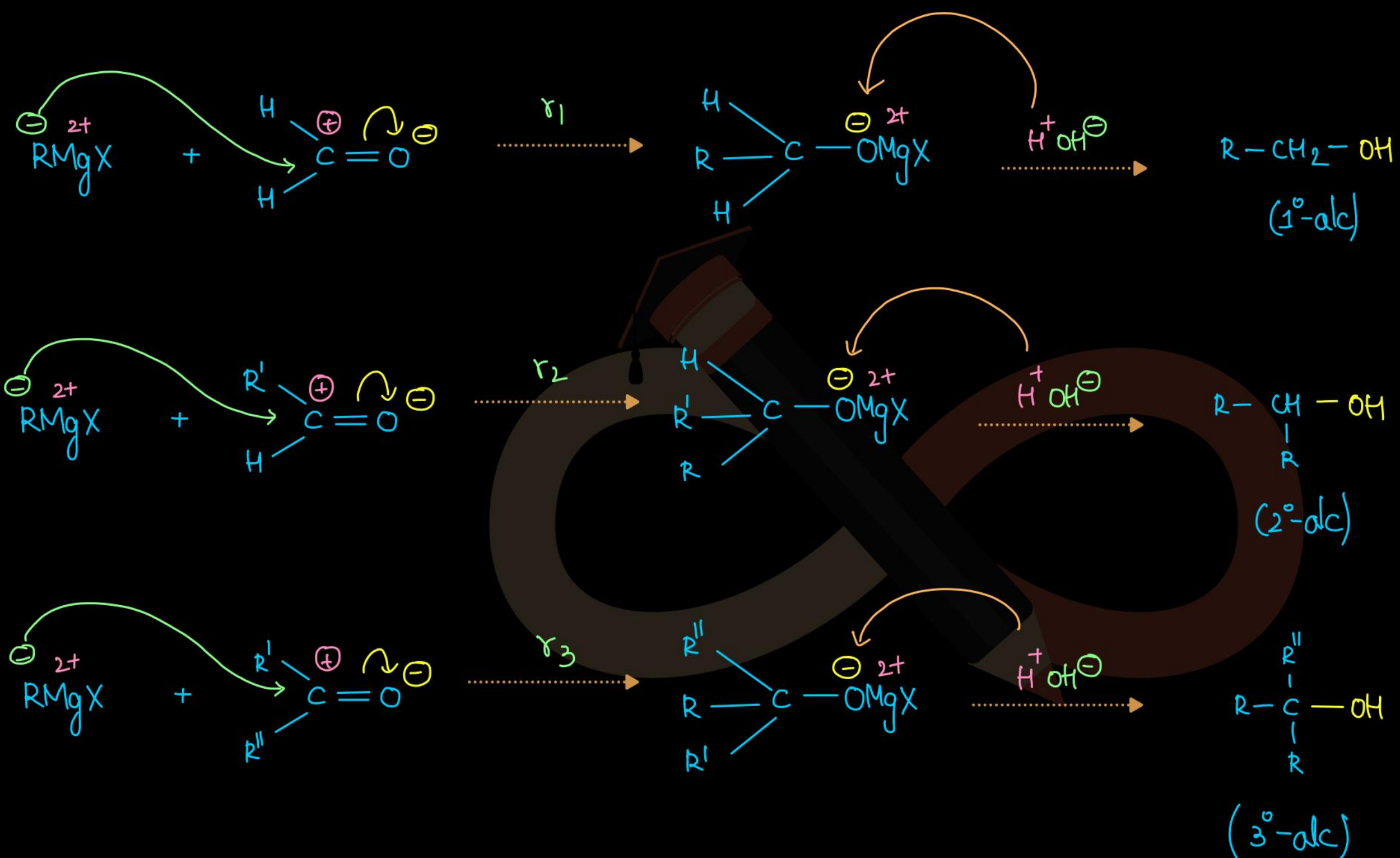


(2 moles)

(1 mole)

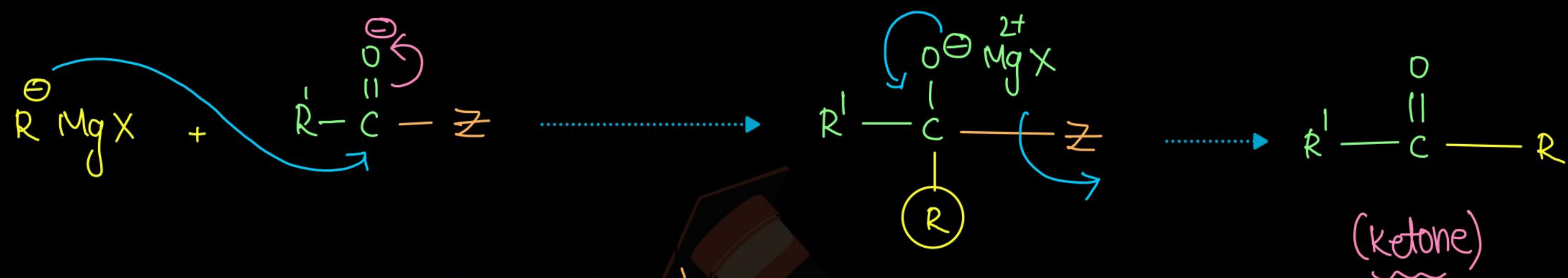


2) Nucleophilic addition reaction (NAR) :



$$\text{R.O.R} \propto \frac{1}{\text{SH}} \Rightarrow r_1 > r_2 > r_3 \quad \{ \text{aldehydes} > \text{ketones} \}$$

3) Nucleophilic Substitution by Addition-Elimination: (S_NAE)

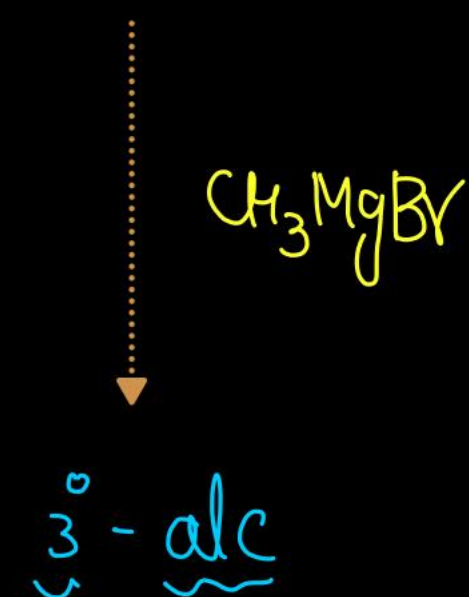


$Z = Cl$ (acid chloride)

$= O-COR''$ (anhydride)

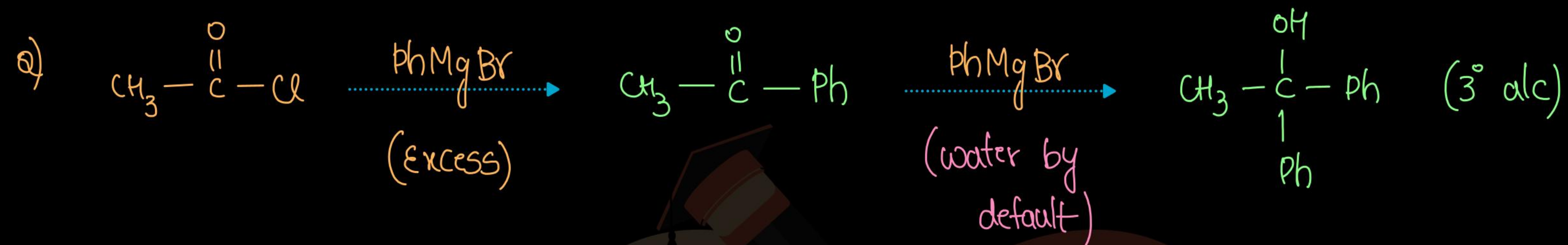
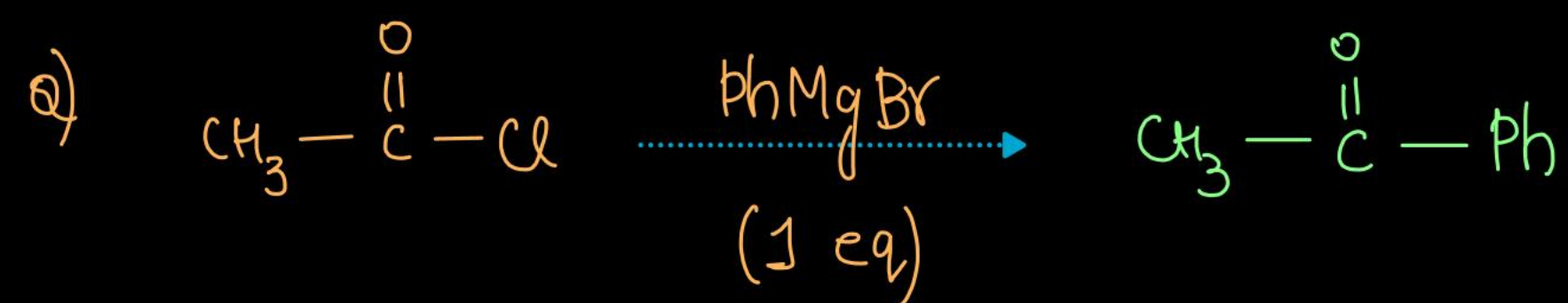
$= OR''$ (ester)

$= NR_2''$ (3° amine)



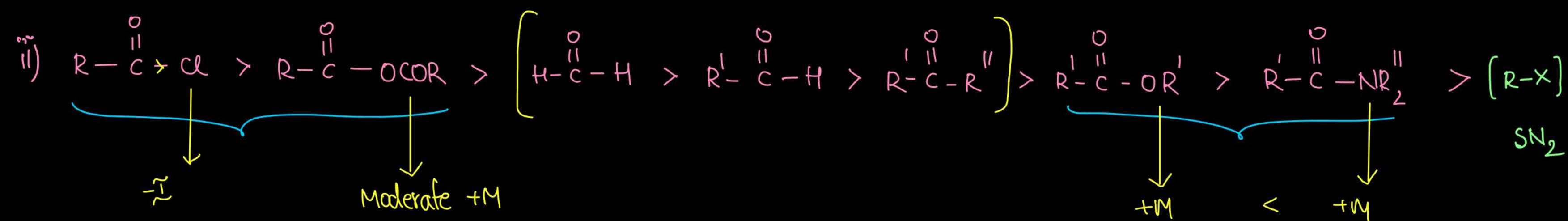
DM:



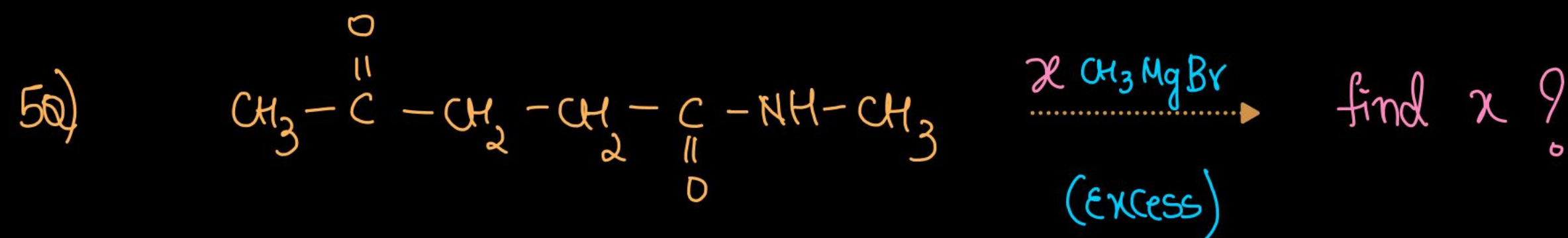
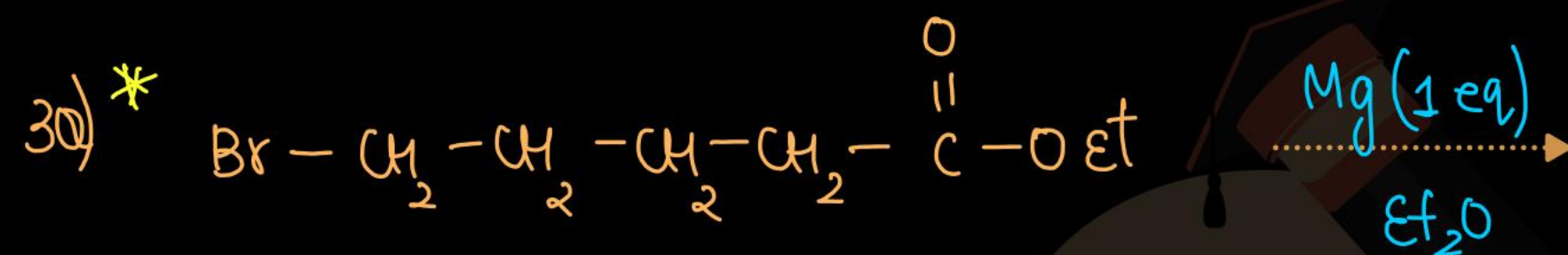
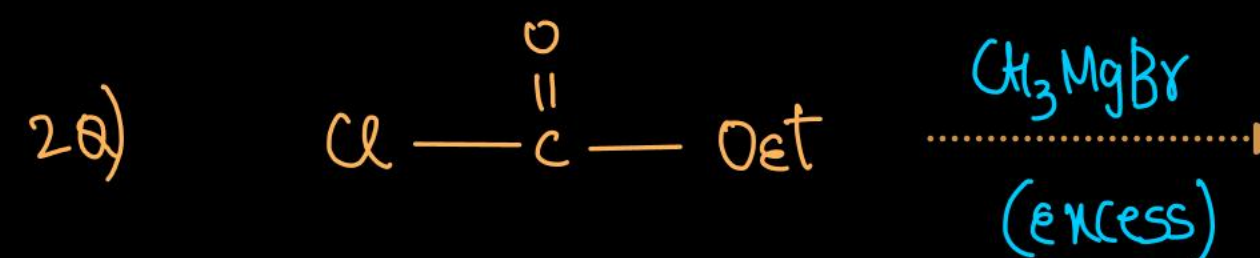
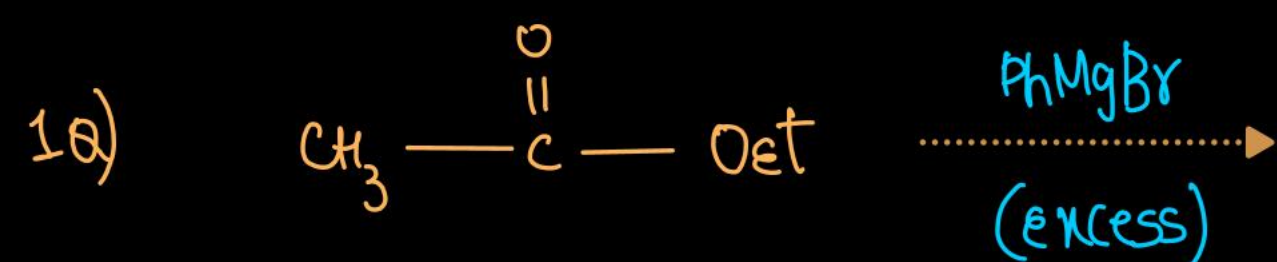


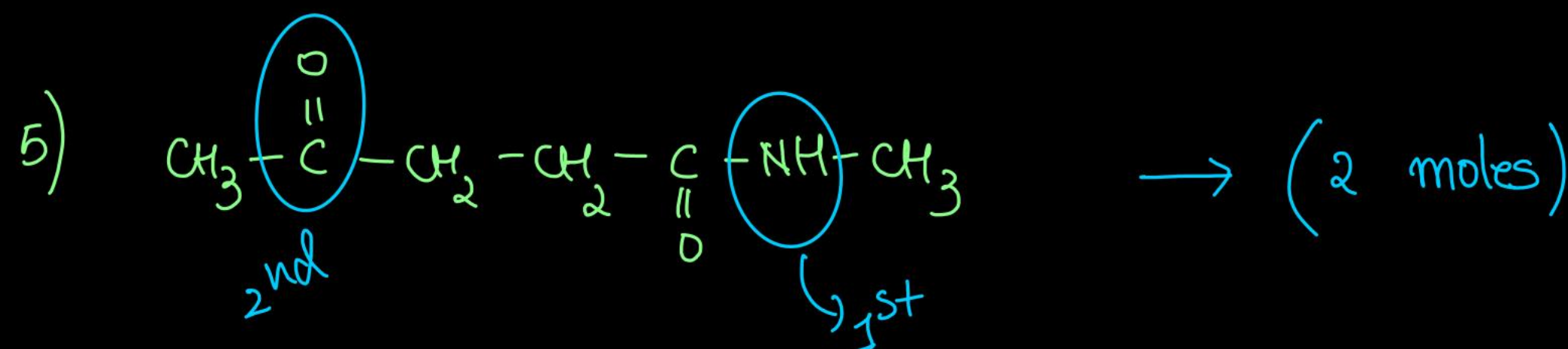
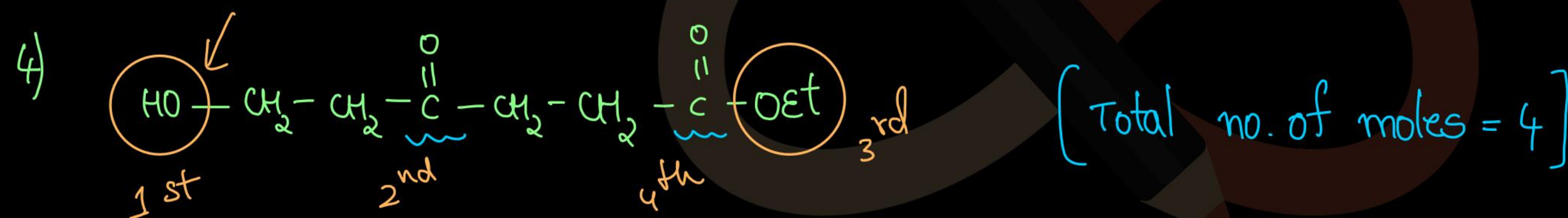
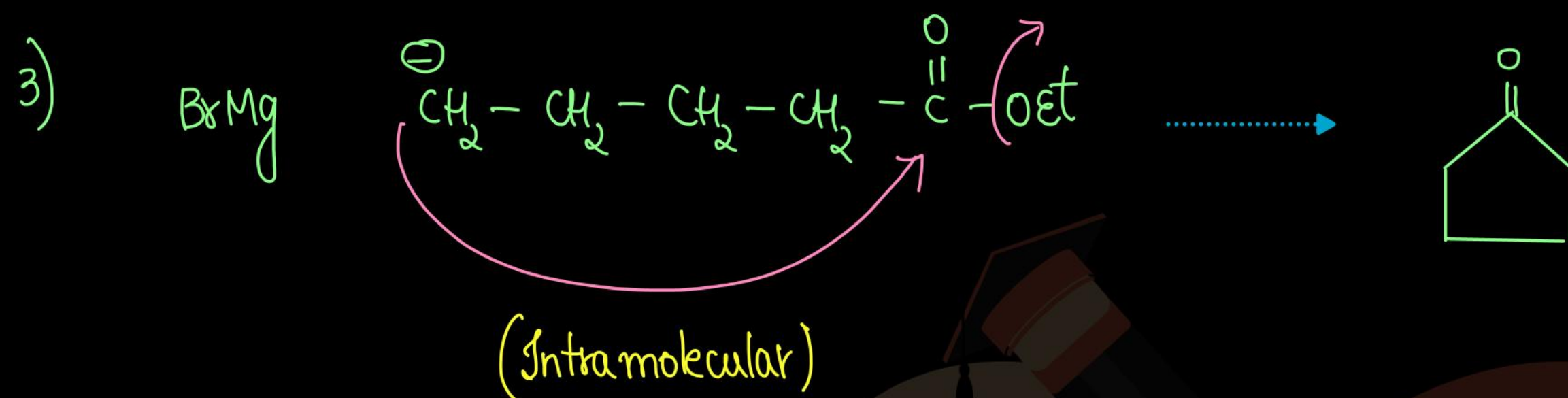
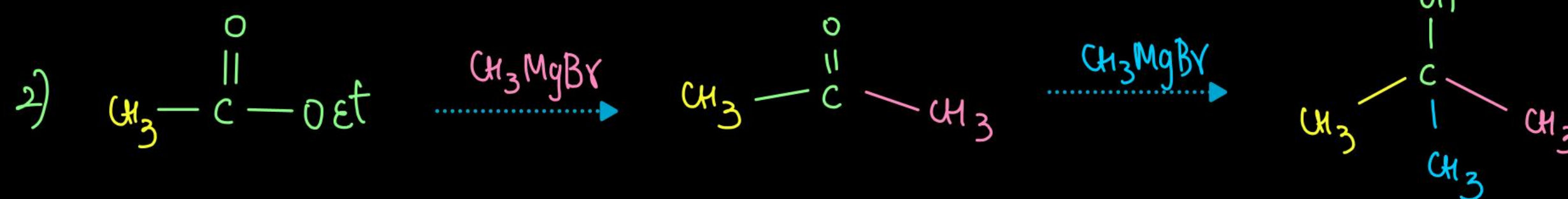
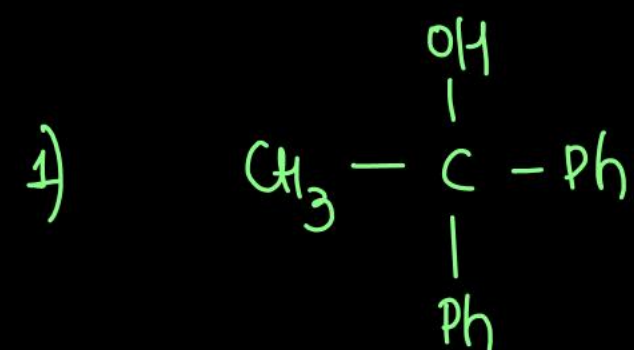
* Reactivity order :

i) Acid Base rxn are fastest

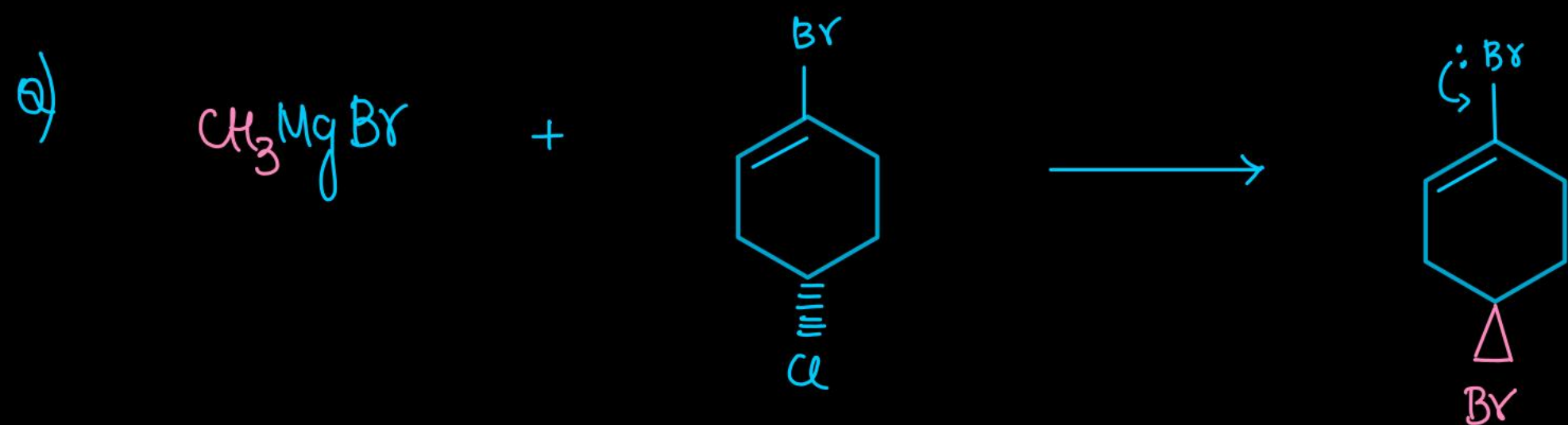
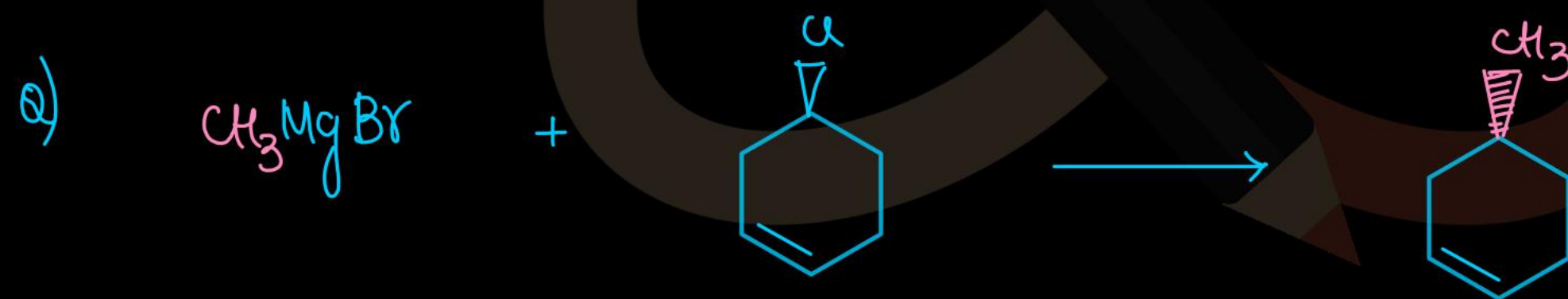
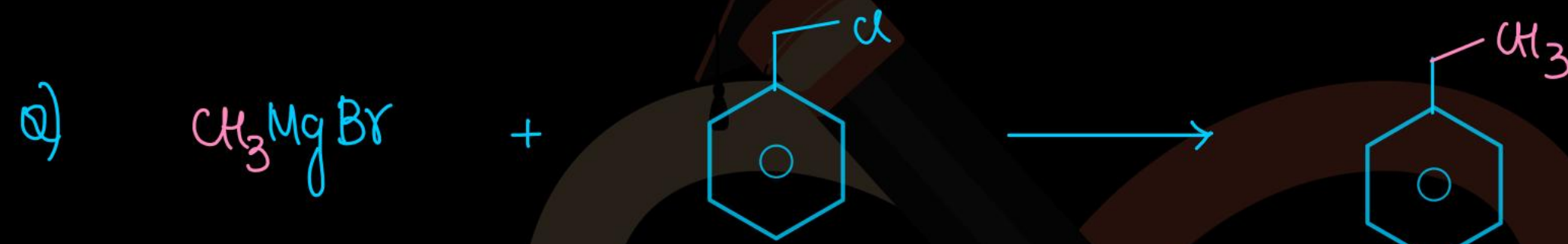
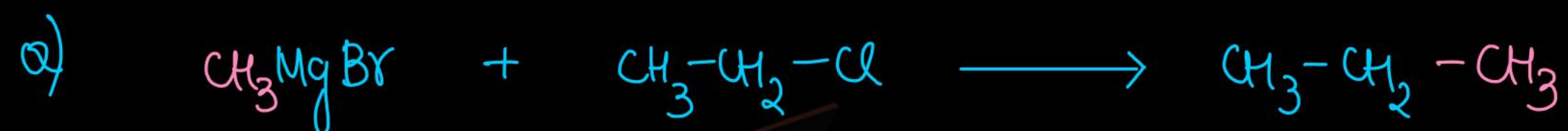
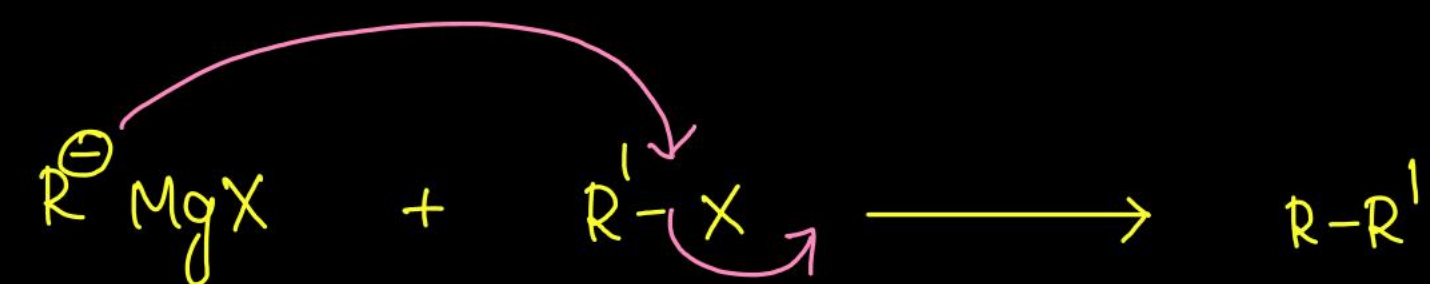


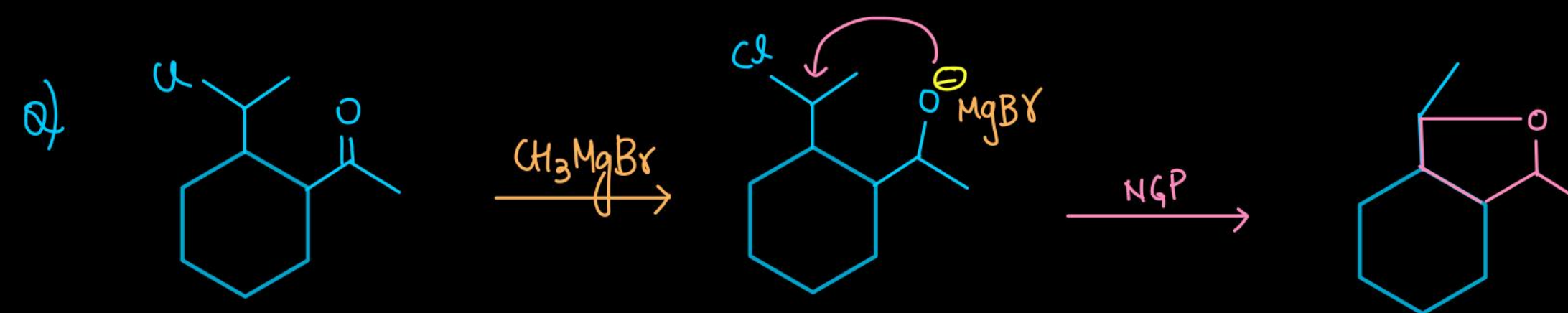
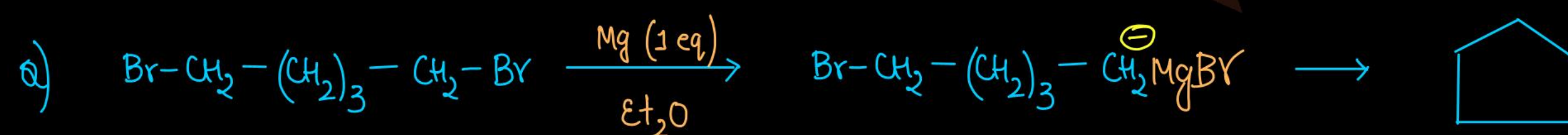
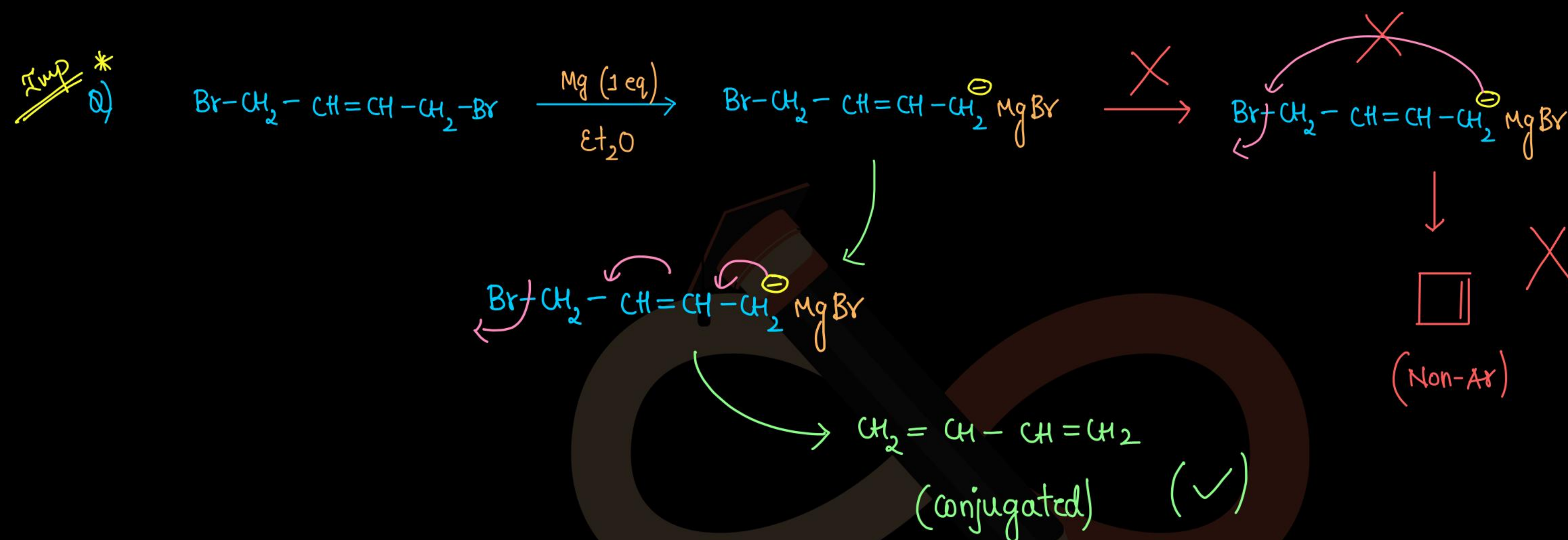
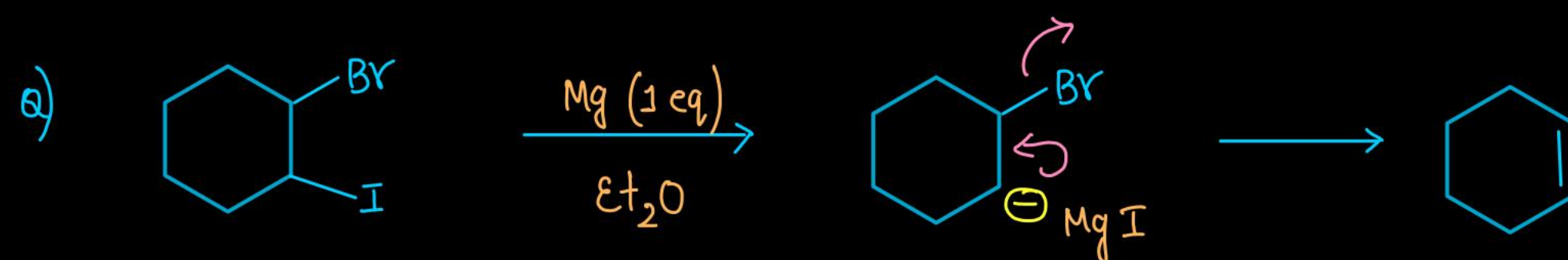
SNAE Practice :



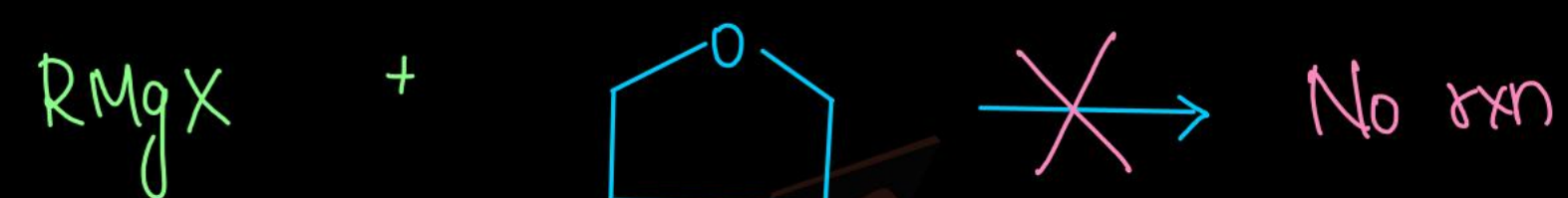
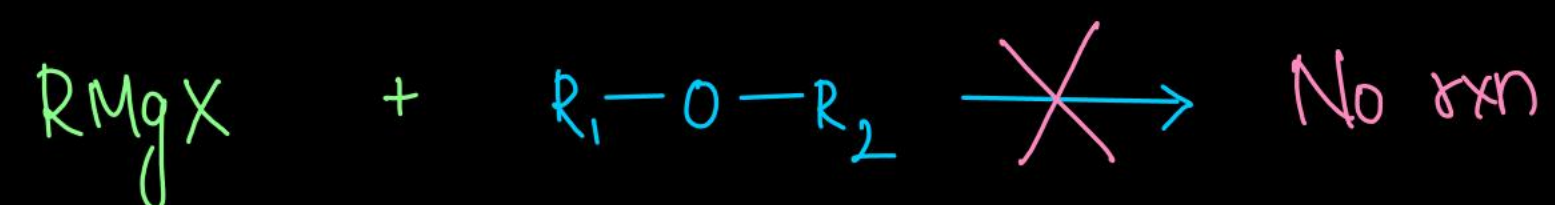


④ SN₂ rxn

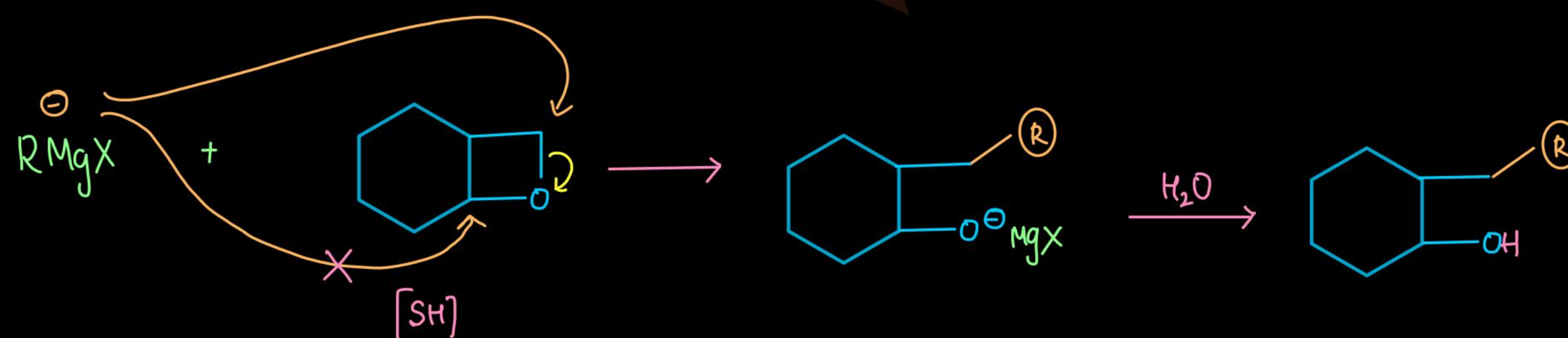
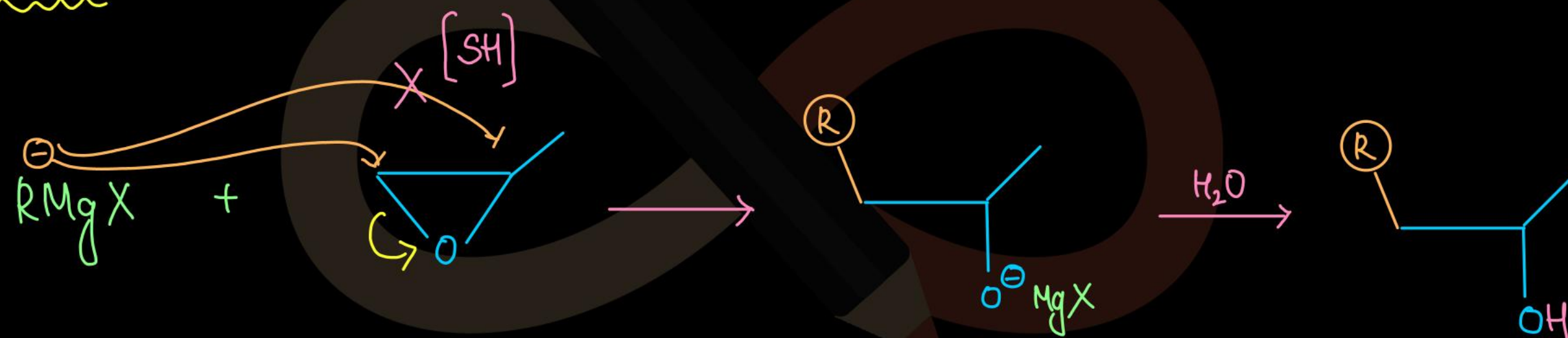




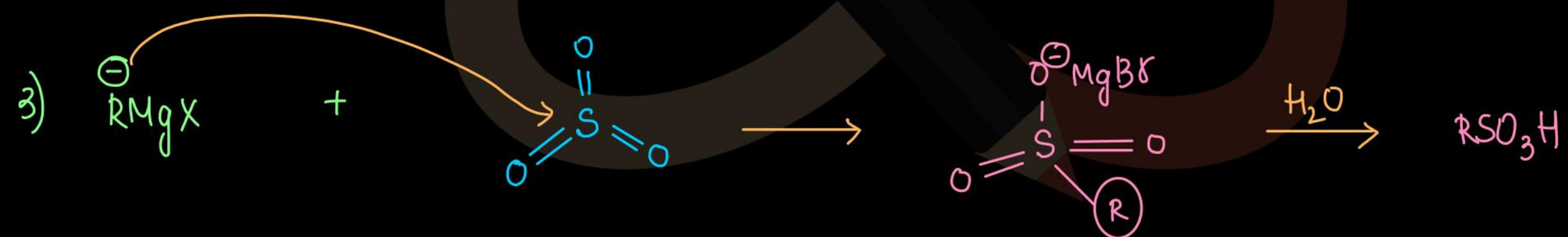
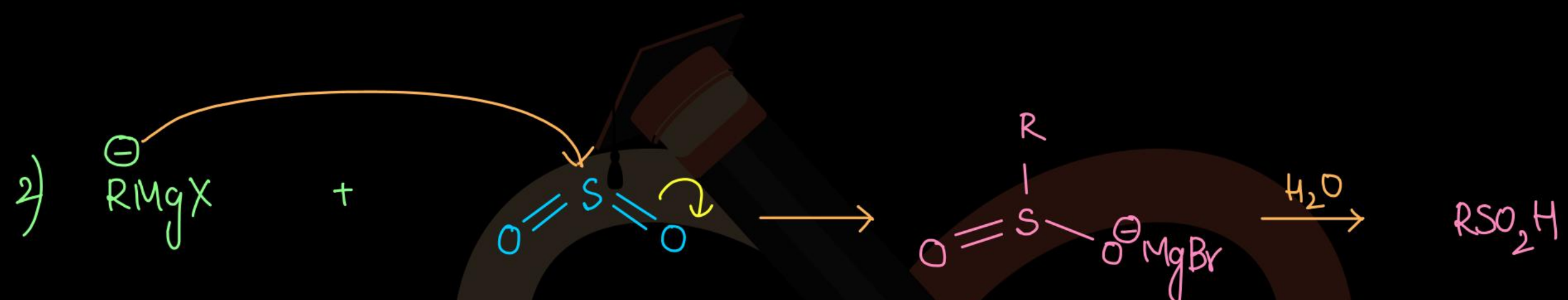
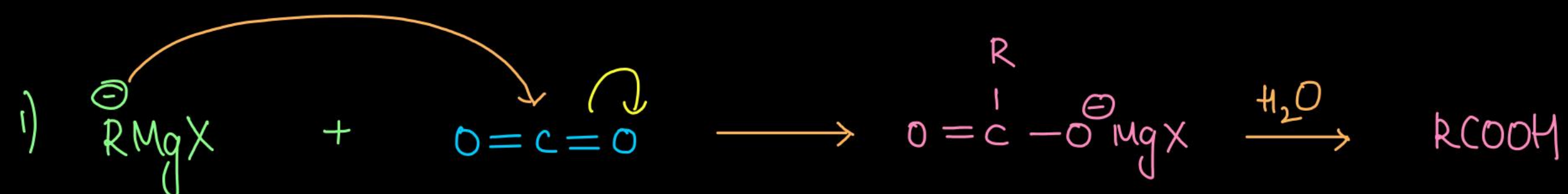
⑤ Rxn with cyclic ether :



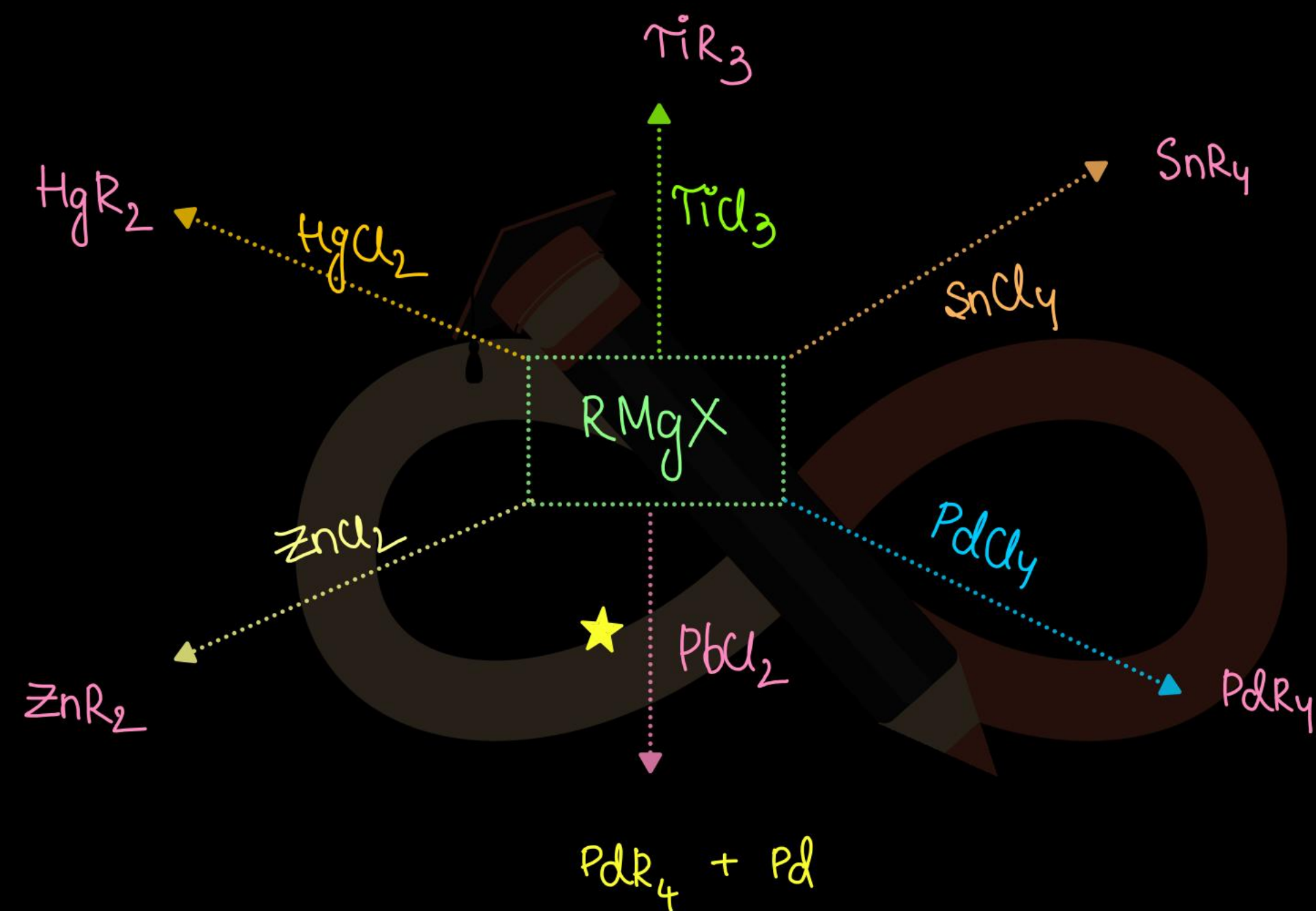
* Only 3,4 membered :



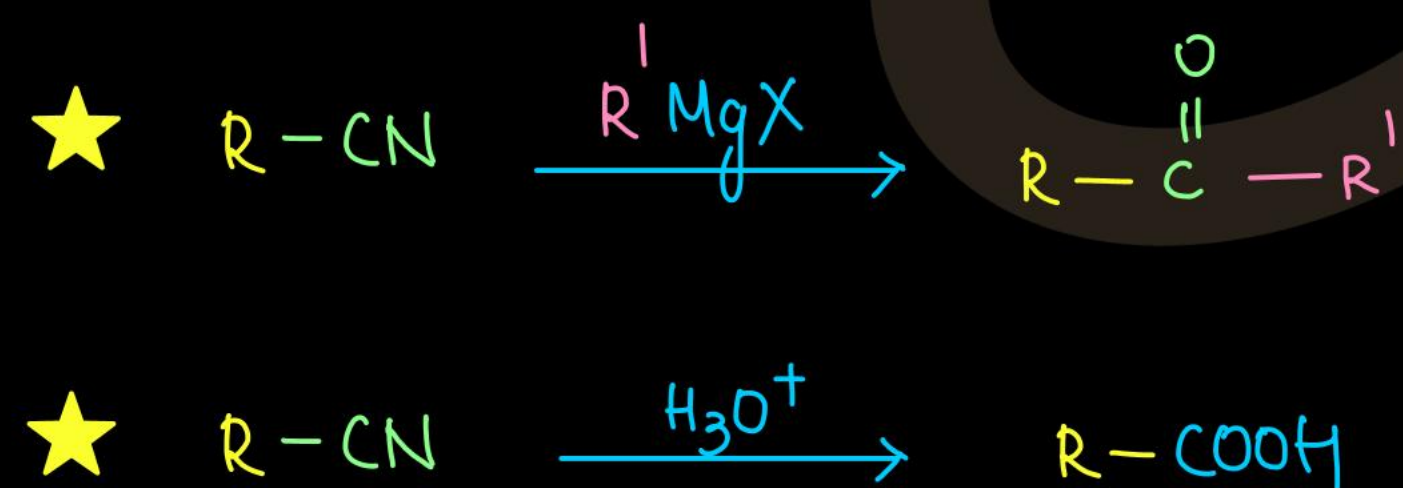
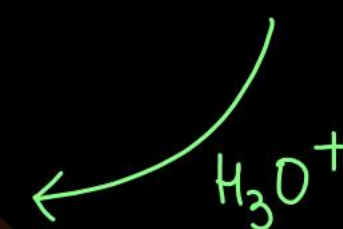
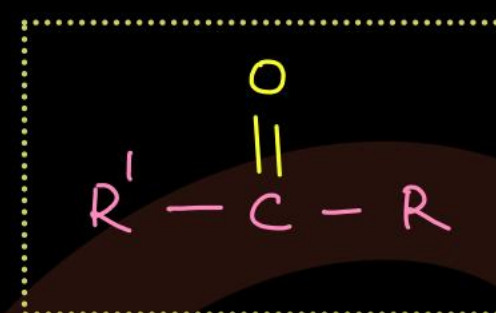
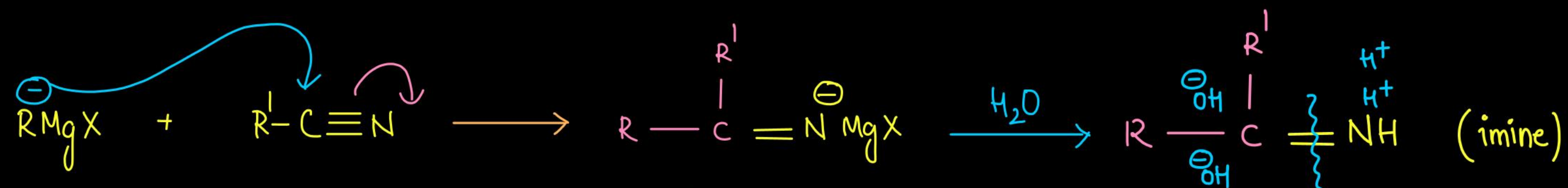
⑥ Rxn with oxides and sulphides



⑦ Rxn with p & d block Compounds :



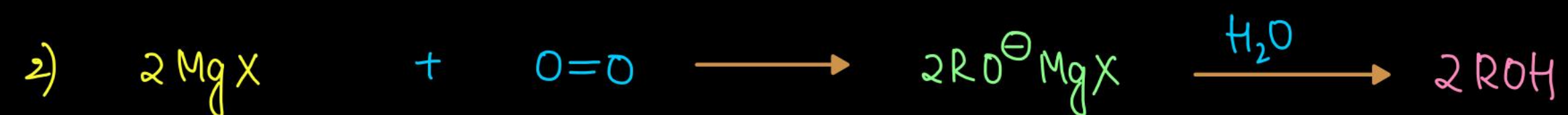
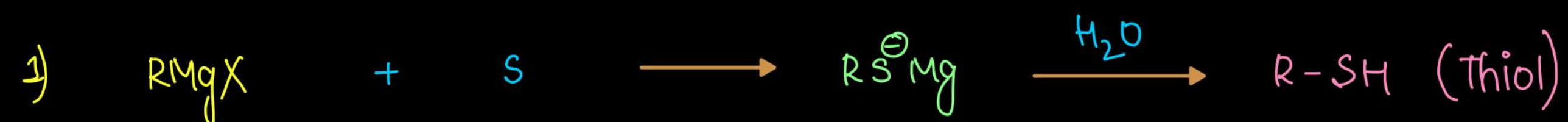
⑧ Rxn with Cyanide :-



⑨ Synthesis of Cyanide :



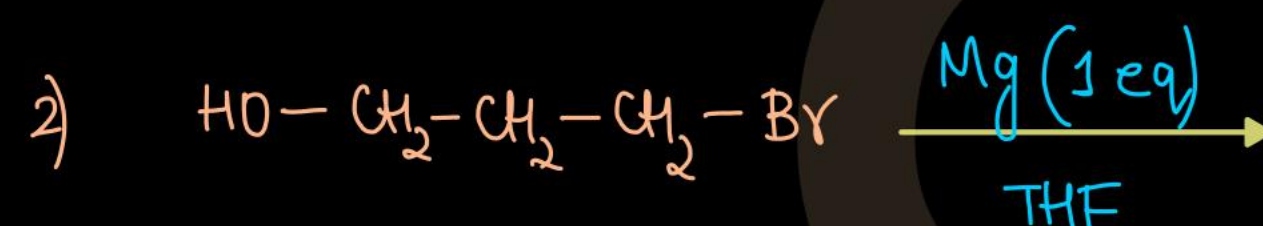
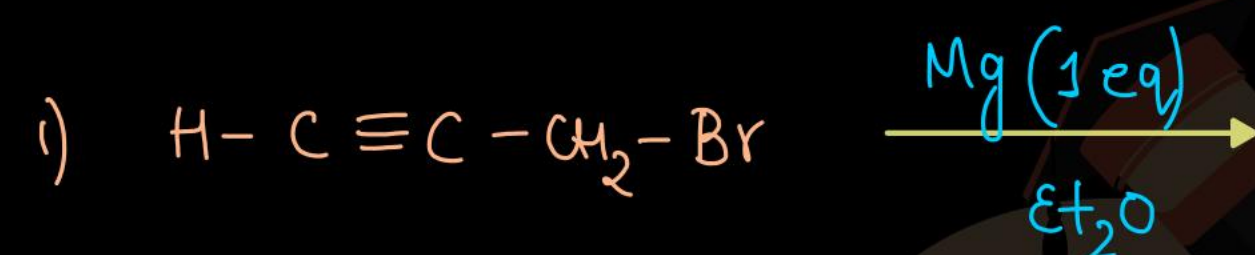
⑩ Rxn with Sulphur and Oxygen :



② Rxn with Halogen

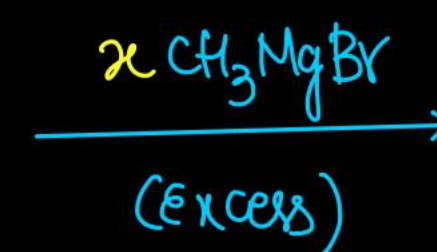
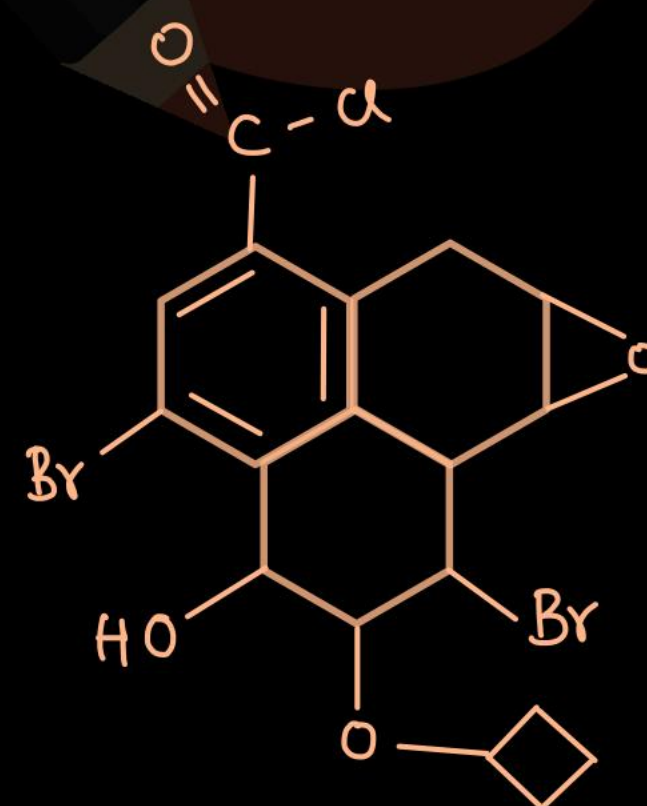


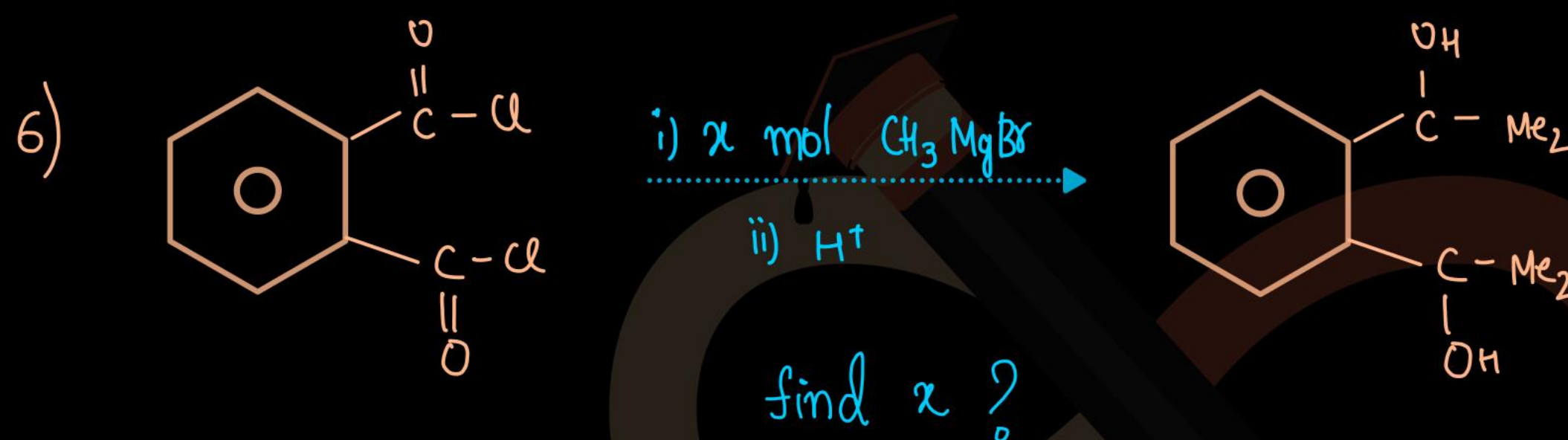
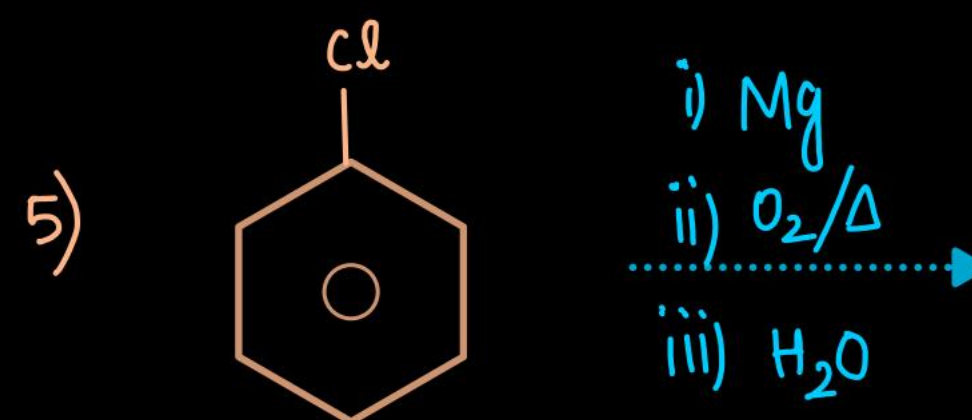
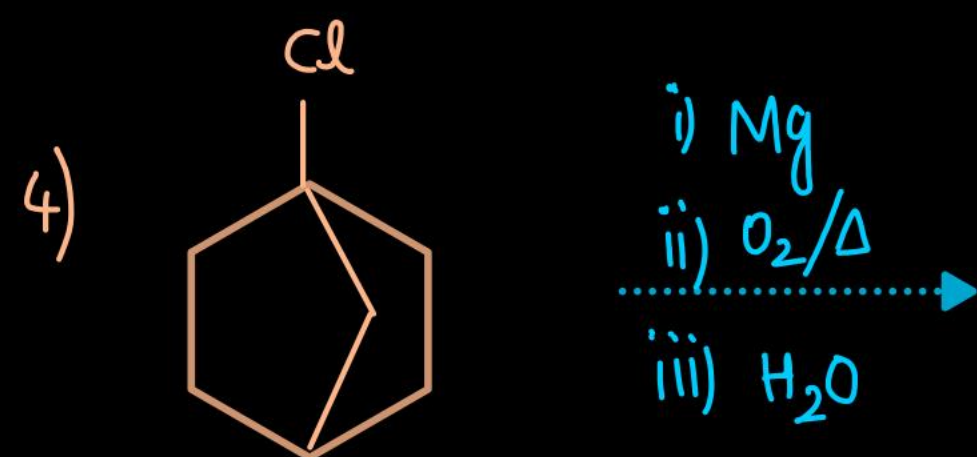
Practice :-



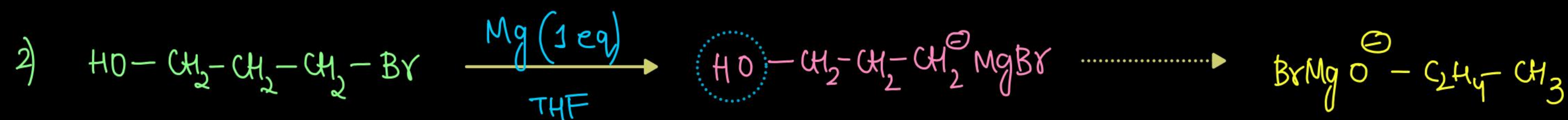
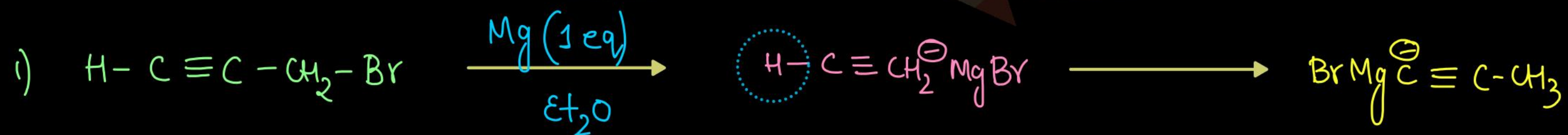
3) Find no. of moles of G.R used ?

$x = ?$

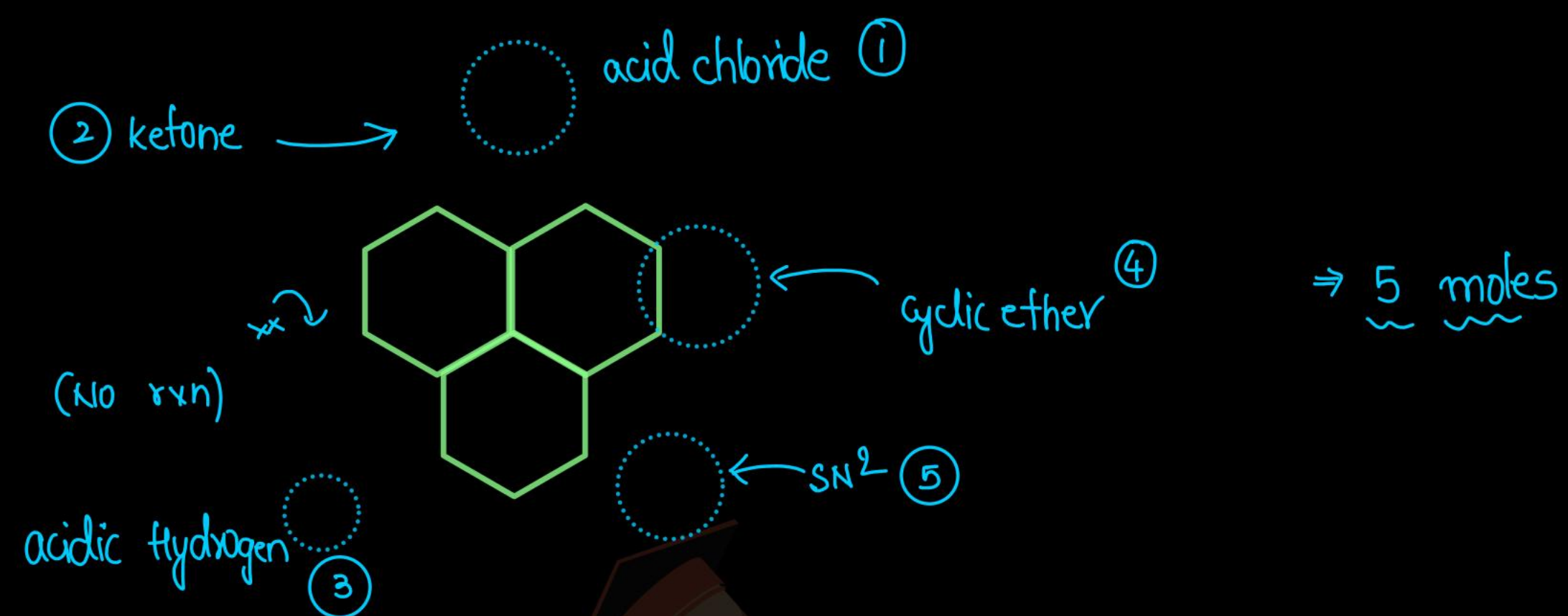




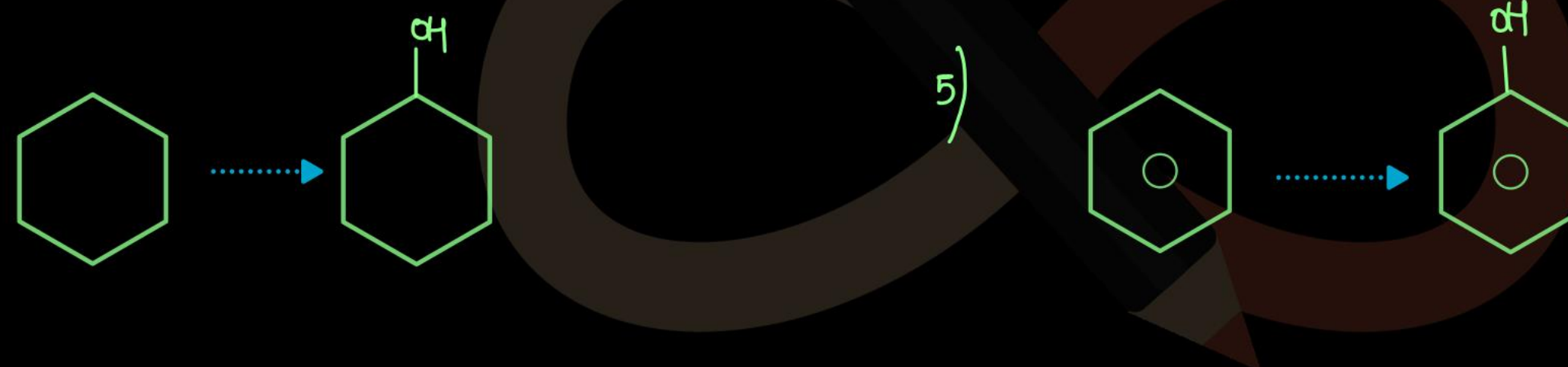
Sol :-



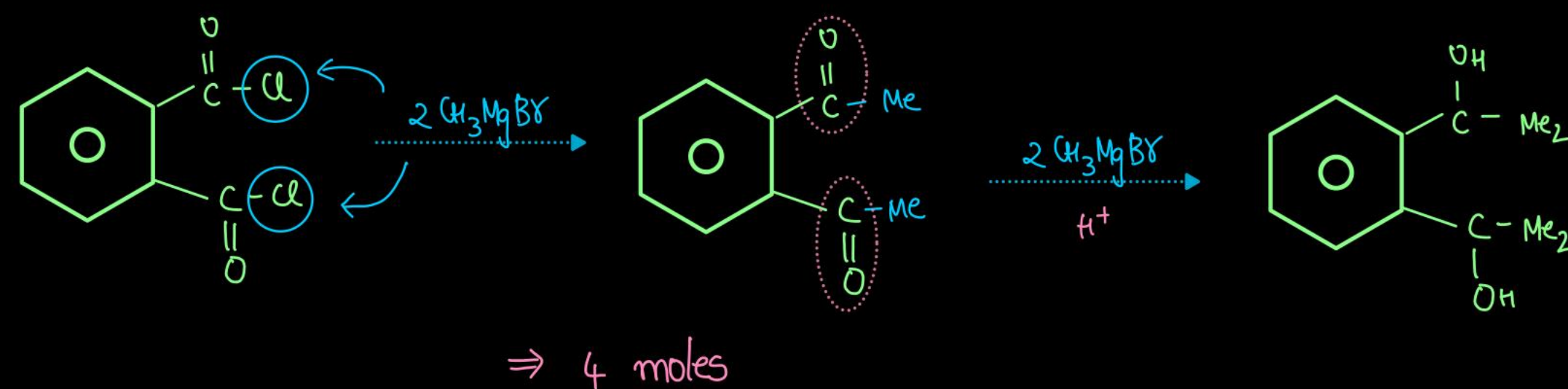
3)



4)



6)



★ Q)

