

BSc. I (H) - PAPER - IC

Reactions of Grignard Reagent

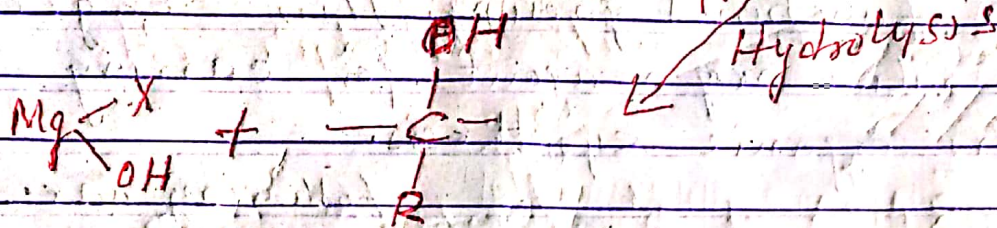
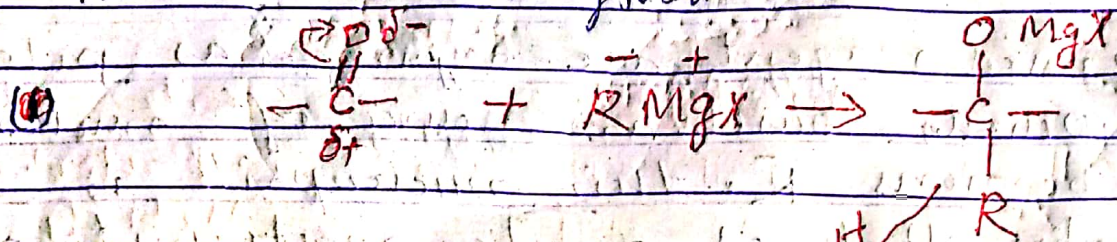
Grignard reagents are regarded as polar compounds which are source of nucleophilic carbonions R^- . This nucleophile is so reactive that it reacts with most of the functional groups. This reagent is a versatile reagent for carrying out various organic synthesis.

Following are the synthetic applications of Grignard reagent are listed below:

1. Nucleophilic reaction of Grignard reagent with carbonyl groups \longrightarrow

Grignard reagent reacts with carbonyl groups of aldehydes, ketones, carboxylate ester, anhydride and amide. Alkyl group of Grignard reagent bonded to carbon of carbonyl group and Mg Magnesium halide is attached to oxygen of carbonyl group.

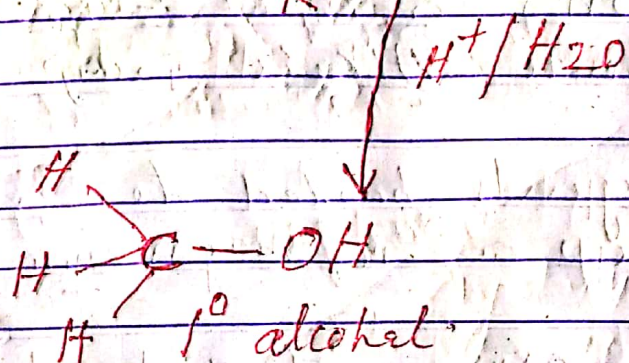
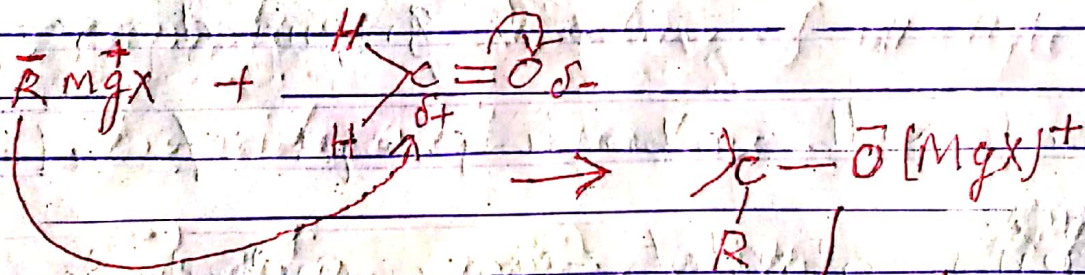
The reaction is given below.



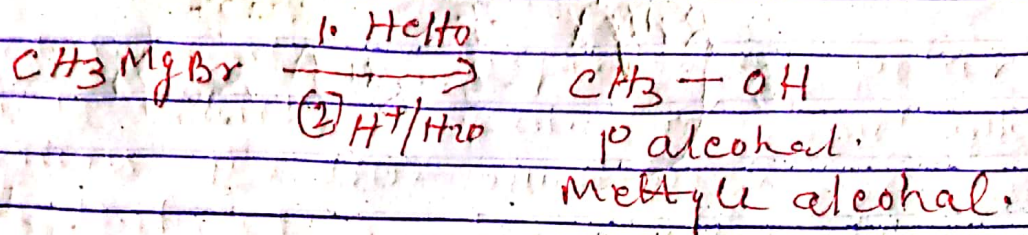
Hydroxy magnesium halide.

The reaction of various carbonyl groups are given below.

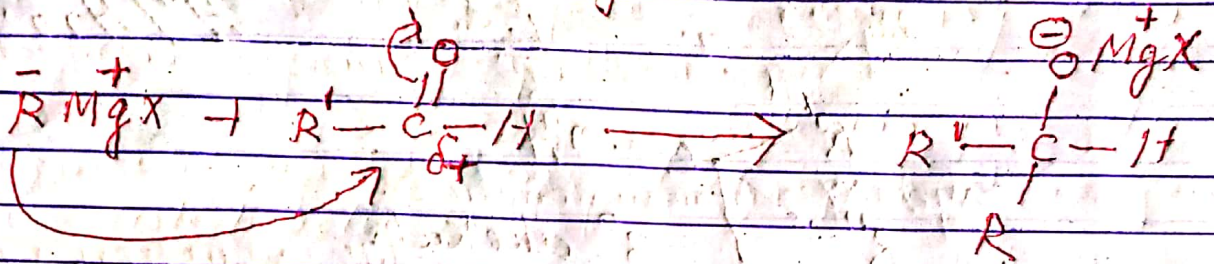
(1) Reaction of with formaldehyde \longrightarrow



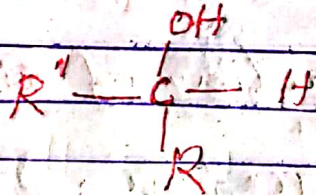
example -



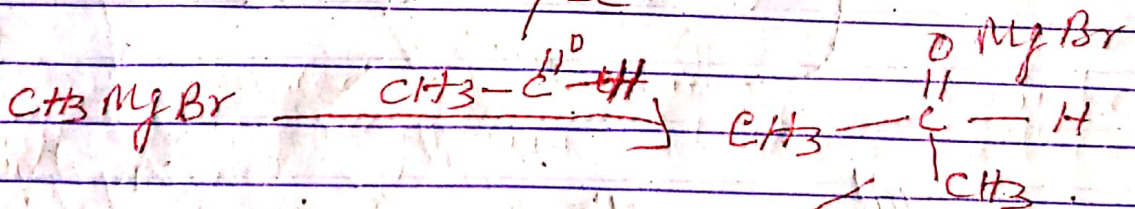
2. Reaction with aldehyde other than formaldehyde



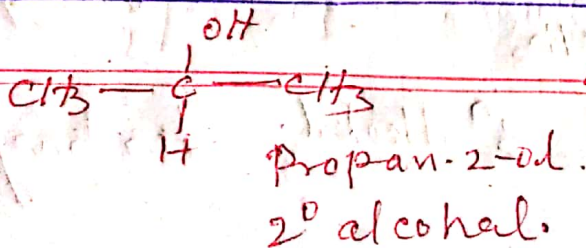
hydrolysis
H⁺/H₂O



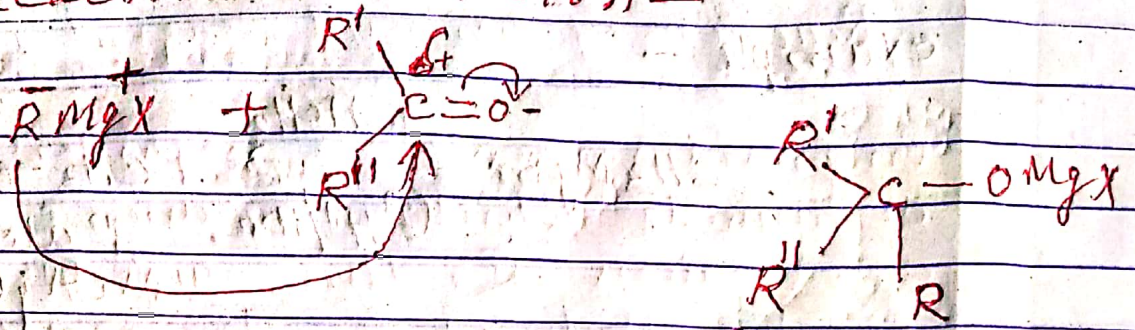
Example - Methyl magnesium bromide with acetaldehyde.



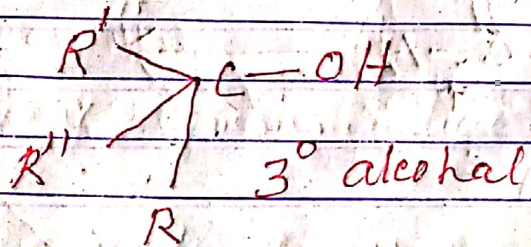
hydrolysis
H⁺/H₂O



③ Reaction with Ketone -

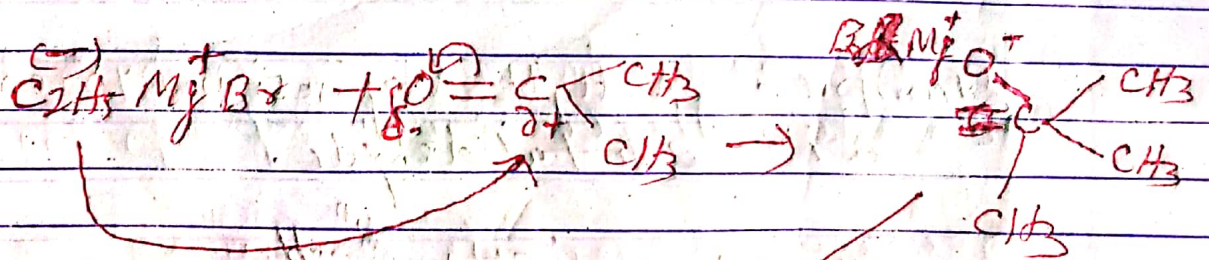


Hydrolysis
H⁺/H₂O



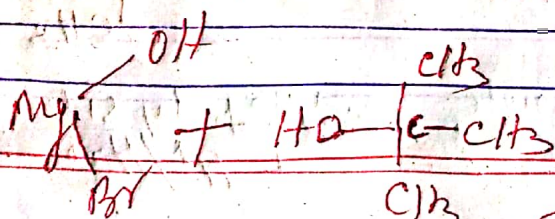
Here R, R', R'' may be equal or different

example - Reaction of ethyl magnesium bromide with acetone.



Hydrolysis

H⁺/H₂O



3^o Alcohol. tertiary butyle alcohol.