

Date: - 2078/11/18

DATE

Organometallic Compound.

The compound in which at least one metal (Ca, Mg, Li, Na) etc is bonded to the organic molecule is called Organometallic Compound.

The study of compound containing metal and carbon bond and their reaction is called Organometallic Chemistry.

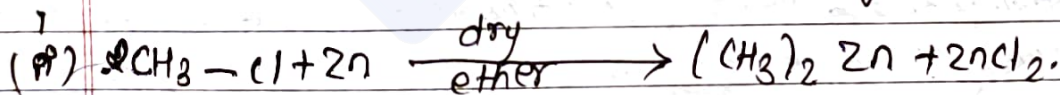
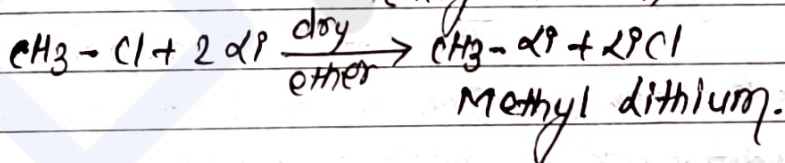
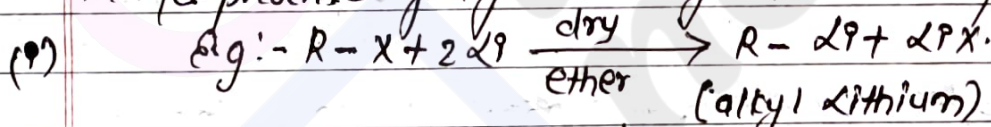
For eg:- Compound: C_2H_5MgBr , $(C_2H_5)_2ZnBr$, $(CH_3)_3AlCl$
Organometallic bond = Mg-C, Zn-C, Al-C

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Organometallic compound represented with molecular formula like organo (R₂Li), organo copper (R₂Cu), organo cadmium (R₂Cd).

* Preparation of Organometallic Compound.

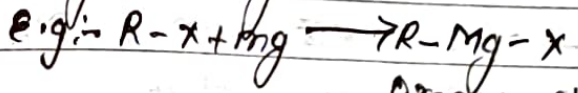
When alkyl halides are treated with metal like (Li, Zn) in the presence of dry ether, alkyl metals are produced.



* Properties of Organometallic Compound.

- (1) The bond between metal and carbon atom is highly covalent.
- (2) Organometallic compounds have low melting point.

* Grignard reagent \rightarrow When haloalkane react with magnesium to give organo-magnesium Halide is called Grignard reagent.



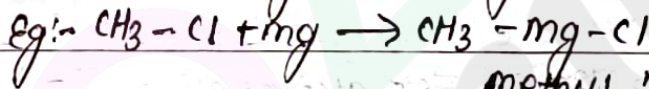
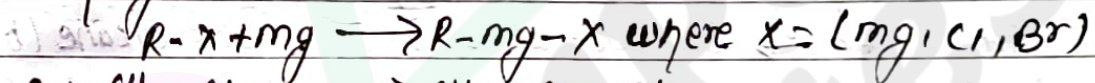
Organometallic Halide.
Organomagnesium

\rightarrow Diethyl ether or dry ether is usually used a solvent during the preparation of Grignard reagent.

\rightarrow Grignard reagent act as reducing agent which is hydrid donor or rather than is a carbon nucleophile.

* Preparation of Grignard reagent.

① From haloalkane:- Alkyl halides react with magnesium in the presence of dry ether to give alkyl magnesium halide called grignard reagent.

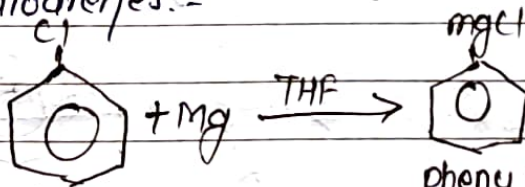


methyl magnesium chloride.

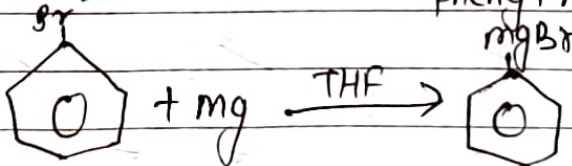
\rightarrow In the place of X fluorine cannot be used because the bond betⁿ fluorine and alkyl group is strong fluorine is less-reactive to give grignard reagent.

S.D. \rightarrow Pure and dry ether is used during the preparation of grignard reagent because it avoid the formation of impurities like H_2O and CO_2 which react with grignard reagent.

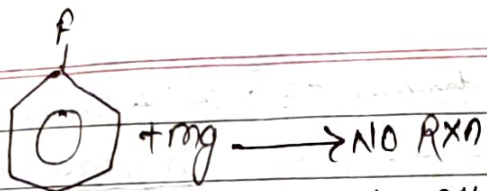
② From haloarenes:-



phenyl magnesium chloride



phenyl magnesium bromide



Haloarenes react with magnesium in the presence of tetrahydrofuran to give magnesium halide.

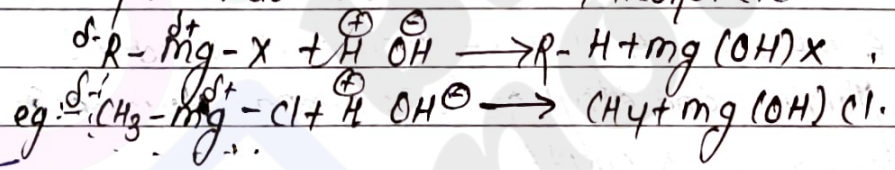
Precautions:-

- (1) Et_2O (ether) are non-aqueous (Aprotic) and anhydrous (water free solvent) so it is used in the preparation of Grignard reagent.
- (2) It should be free from moisture.
- (3) It should be free from air otherwise O_2 from air combines by hydrolysis to give carboxylic acid.

~~V.V.V. Imp~~

Reaction of Grignard Reagent (G.R)

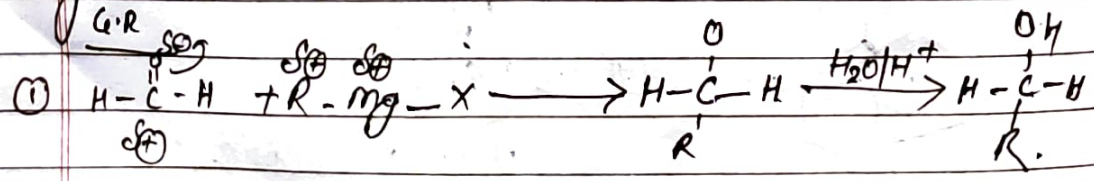
(1) With water: \rightarrow GR react with water to give alkane (because carbon atom of GR is more electro negative than mg). So it react with proton donor like water, alcohol etc.

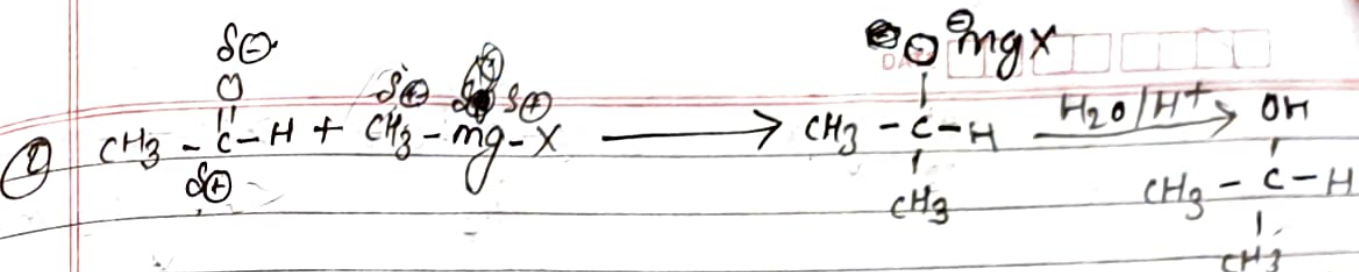


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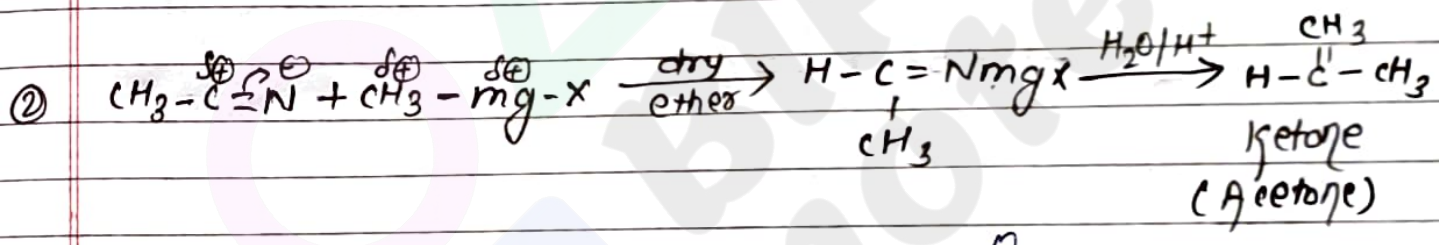
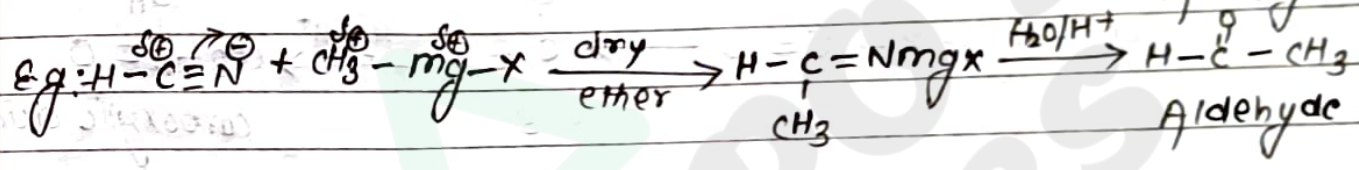
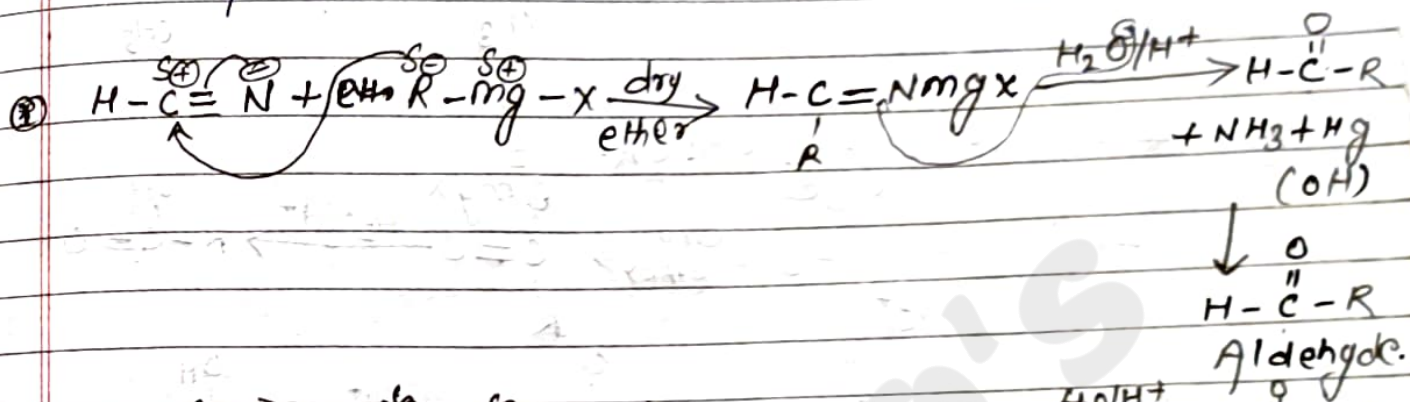
(2) Preparation of 1° alcohol and 2° alcohol from Grignard Reagent:

preparation of primary alcohol, secondary alcohol and tertiary alcohol from Grignard reagent are given below:-

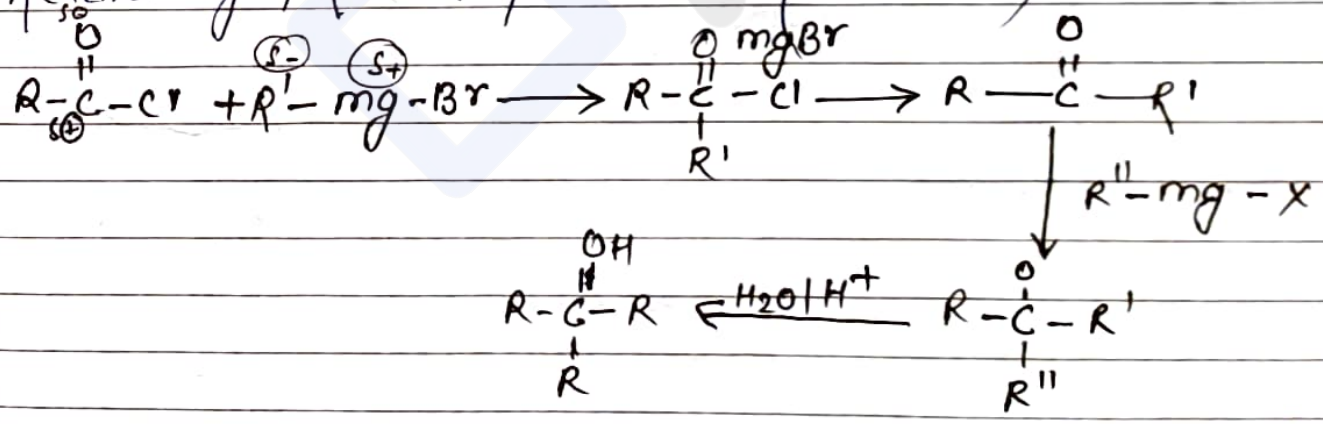




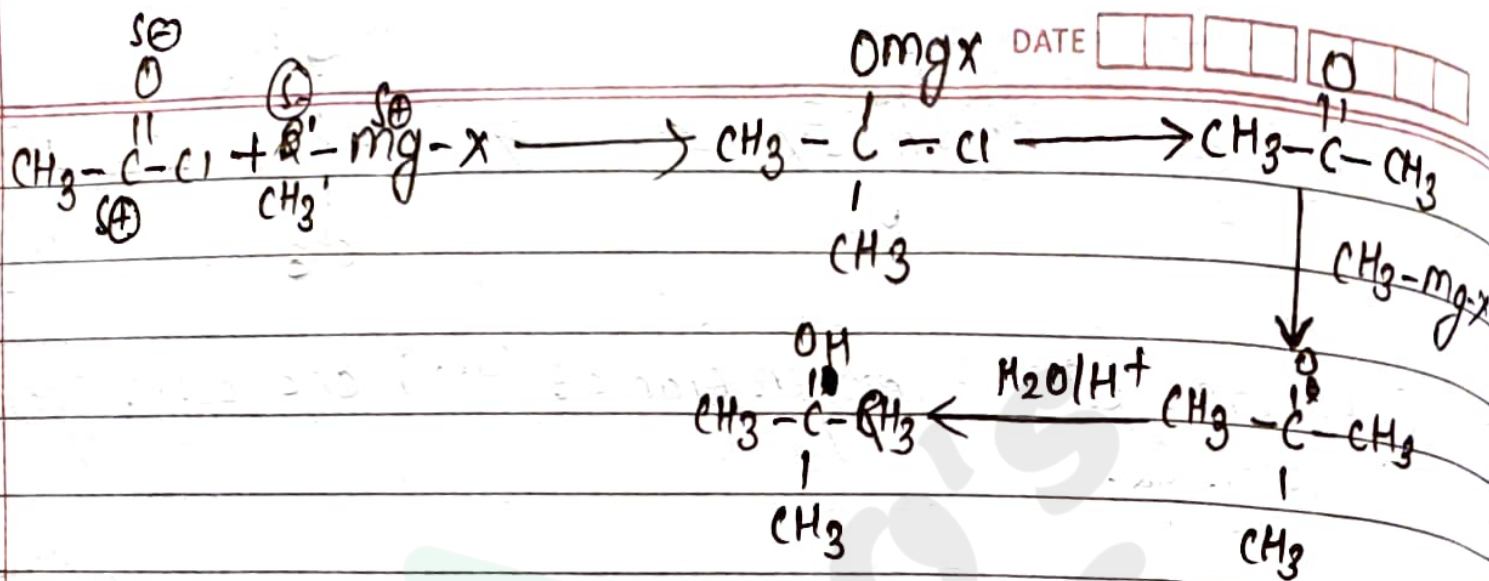
③ Reaction with Hydrogen cyanide (HCN) and alkyl cyanide (RCN) with Gr.



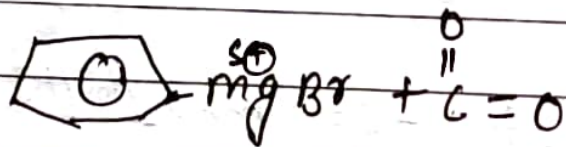
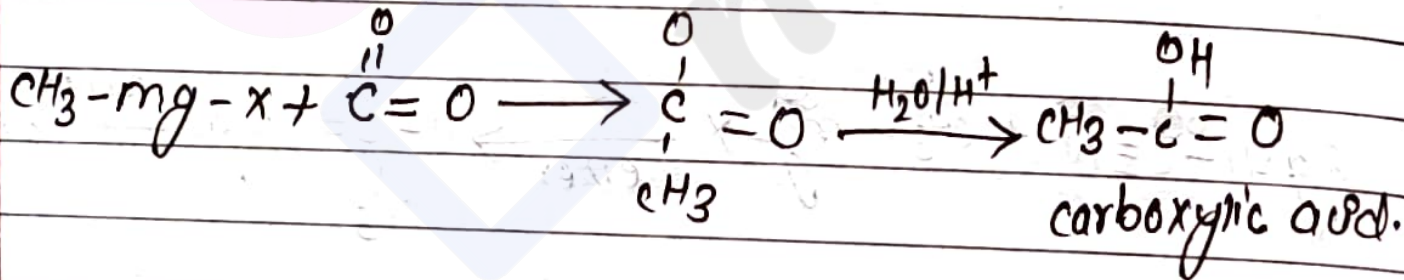
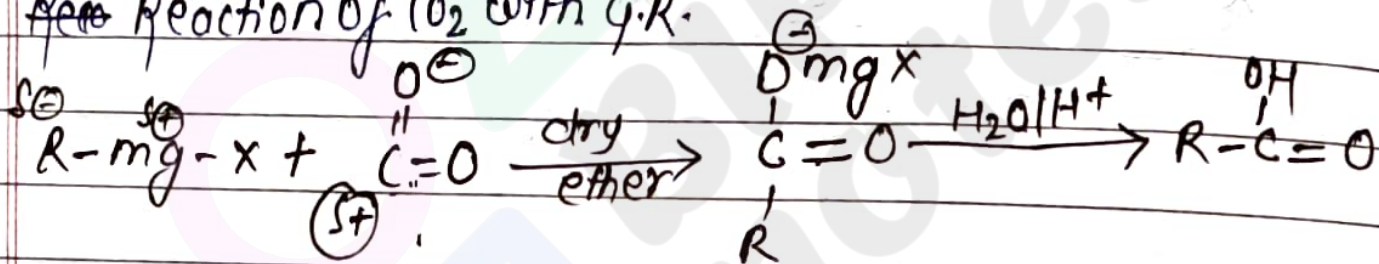
④ Reaction of Gr with Acid chloride (R-COCl)



Aprotic - Donot give proton.



④ ~~Acid~~ Reaction of CO₂ with G.R.










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Class 12 complete notes and paper collection.

Folders Name ↑

 Biology	 chemistry
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