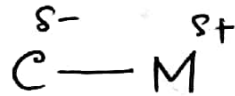


Organometallic compounds contain carbon-metal bond

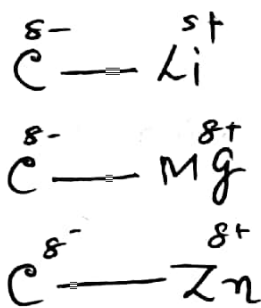


where carbon is partially -ve charge and metal is partially +vely charge

depending upon the electronegativity of carbon and metal the ionic character of C-M bond varies.

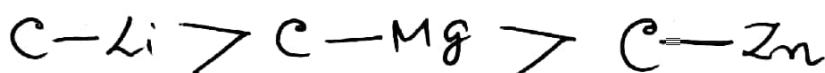
More the electronegativity difference betwⁿ C and M, more is the % age of ionic character and hence more is the reactivity of that organometallic compounds.

consider following C-M bond



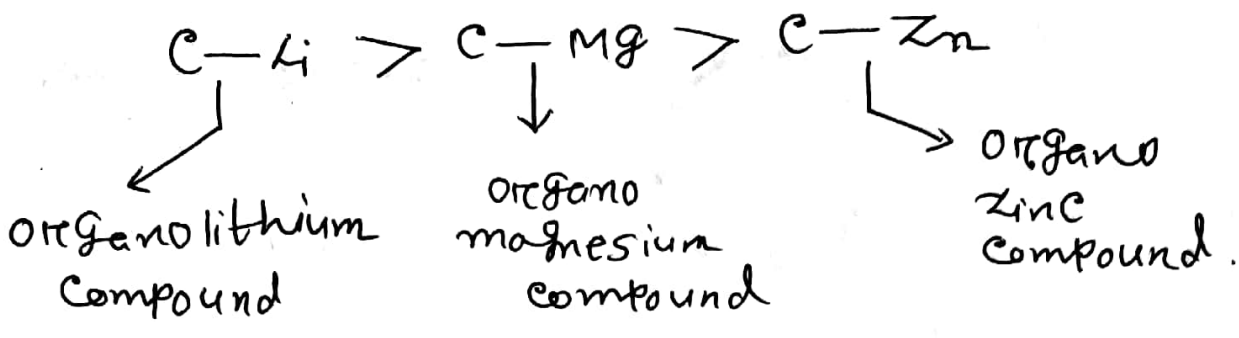
positivity of electron of metal decreases from Li → Mg → Zn

so electronegativity difference betwⁿ C-M decreases.

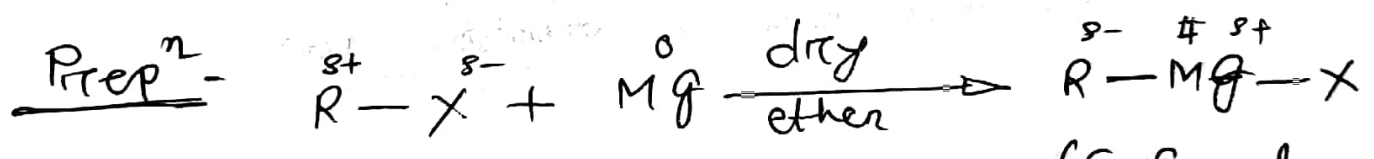


→
ionic character decreases.

Reactivity decreases. as

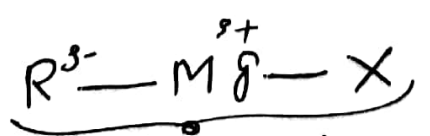


At first we will discuss organo-magnesium compound. Grignard reagent is an example of most common organomagnesium compound. Victor Grignard got Nobel Prize in 1911 for the preparation and synthetic utility of Grignard reagent.

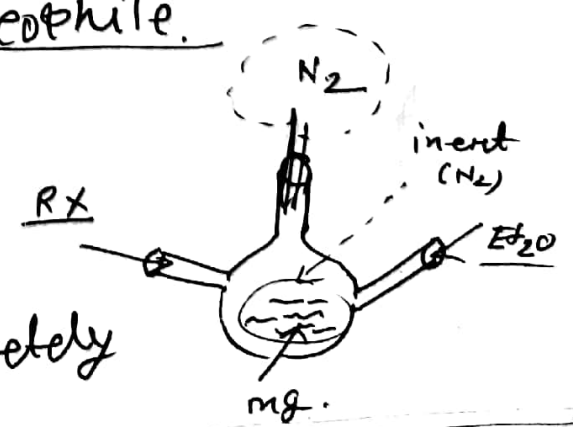


It is an example of oxidative addition (Grignard reagent). \rightarrow Mg (0) is converted to Mg (II).

Umpolung reactivity \Rightarrow $(\text{R}^{\delta+})$ converted $(\text{R}^{\delta-})$ i.e. electrophilic nature of alkyl group gets converted to nucleophile.



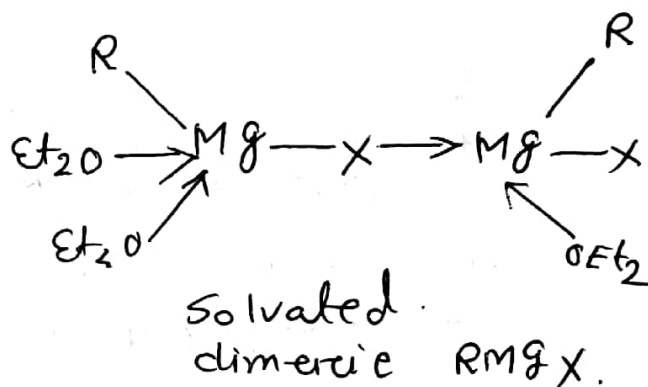
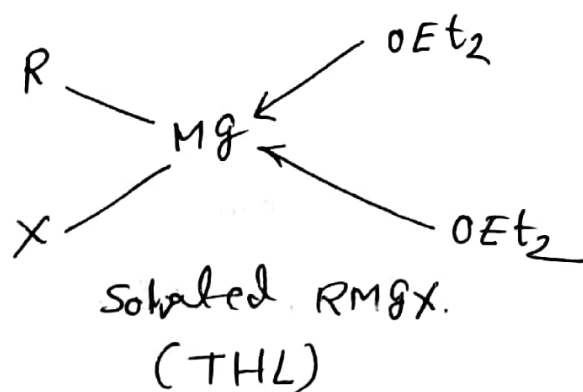
It is prepared under inert atmosphere (N₂), completely of O₂ and moisture free.



Not always Et_2O , diethyl ether (3)
 but THF, 1,4-Dioxane and others ethers
 are also used as solvent.

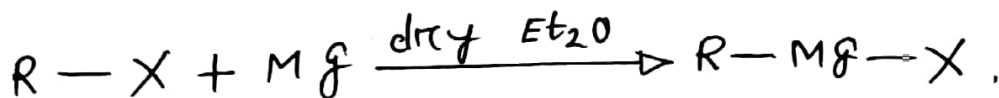
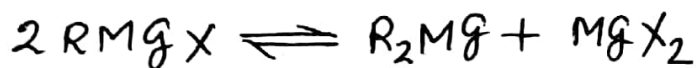
structure of Grignard reagent

In most case alkyl magnesium halide
 do not exist freely



$\text{EtMgBr}(\text{OEt}_2)_2$ isolated
 as crystalline form.
 (X-ray analysis).

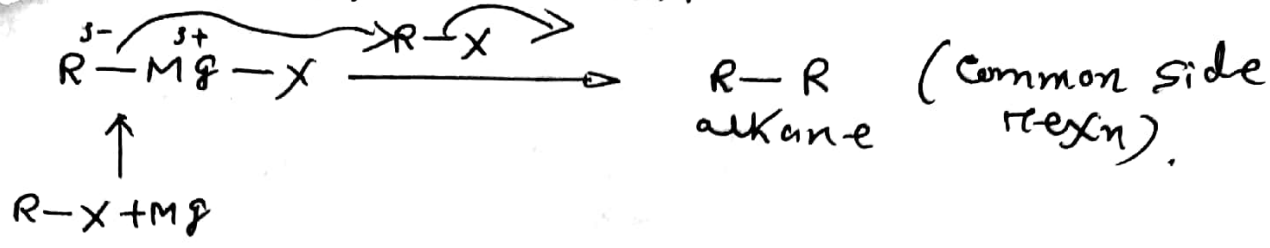
Schlenk equilibrium! The composition of
 Grignard reagent sometimes be represented
 as by following equilibrium.



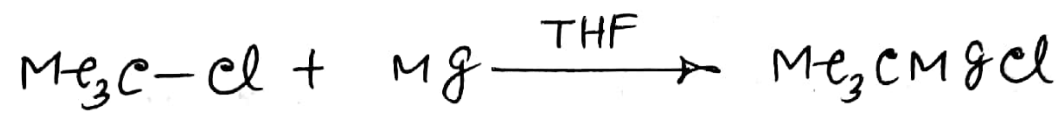
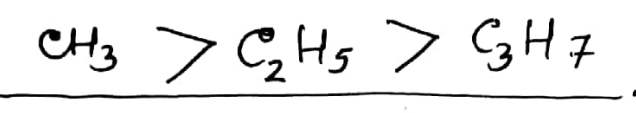
Reactivity of halide ions towards RMgX
 formation is iodide > bromide > chloride

because as the R-X bond length increases
 more easily it will be broken and more
 easily Mg -metal can be inserted inbetween.

* Side Product alkane is sometimes formed during RMgX Preparation.



* The reactivity of R group during RMgX Preparation is.

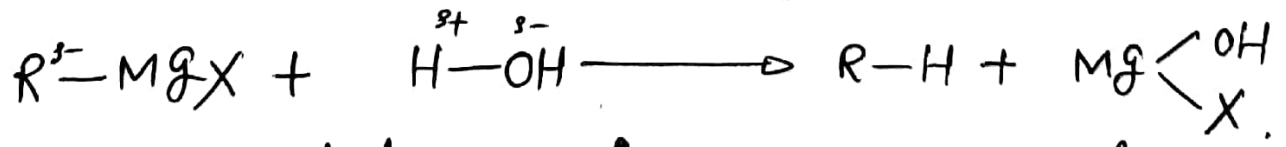


Since 3° iodide readily eliminates HI and produce alkene during rxn.

* Why GR not formed in moisture.

Condition?

Since alkyl group of RMgX is partially -vely charged it acts as base and abstract active H from water resulting rapid rxn to access hydrocarbon product.



Why needed O₂ free environment?

