

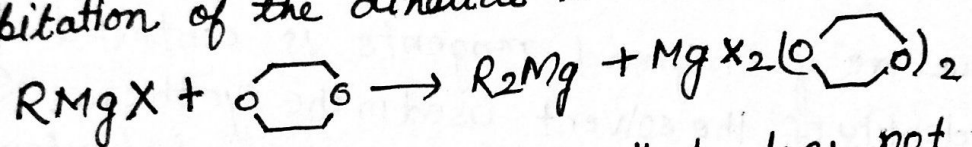
ORGANOMETALLICS

Dialkyl Magnesium (R_2Mg)

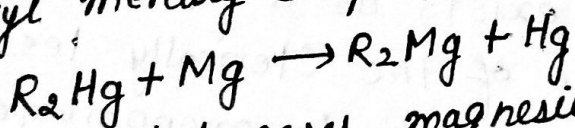
Dialkyl magnesium compounds are nonvolatile white solids. They generally have similar reactivity to their Grignard analogs.

Synthesis

The general synthesis of R_2Mg is carried out by the reaction of Grignard with dioxane ($C_4H_8O_2$), where the precipitation of the dihalide is the reaction driving force.



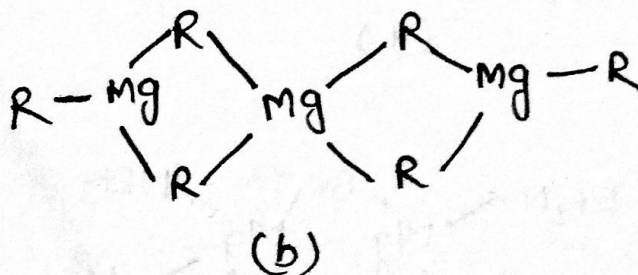
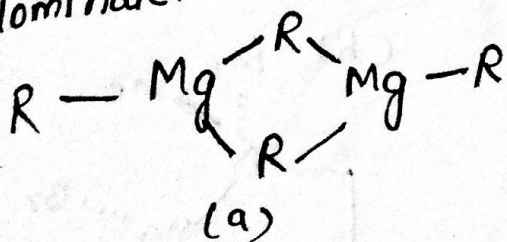
There is another synthesis that does not require dioxane involves the metal exchange reaction between magnesium metal and a dialkyl mercury compound.



Finally, in selected cases magnesium will react with acidic hydrocarbons such as cyclopentadienyl at high temperatures (600°C)

Structure:

The vapor phase dialkyl magnesium compounds are generally monomeric linear compounds. In solution, the absence of coordinating solvents R_2Mg form a variety of oligomers. In the presence of coordinating solvents molecular weight measurements. In the absence of coordinating solvents 4-coordinate monomers predominate.



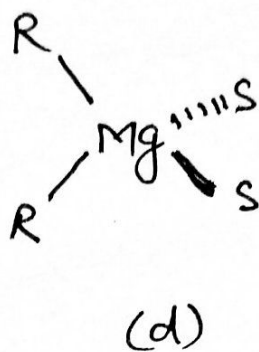
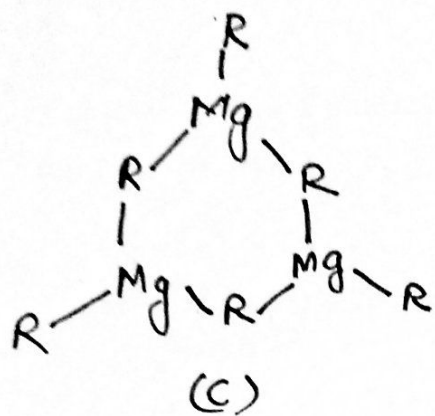


Fig- Solution structure of R_2Mg ($R = Me, Et$) in (a-c) non-coordinating solvents and (d) diethylether.

As similar trend is observed in the solid state, where polymers have been characterized in the absence of co-ordinating solvents. while monomers or dimmers are generally observed when crystallized from a co-ordinating solvent.

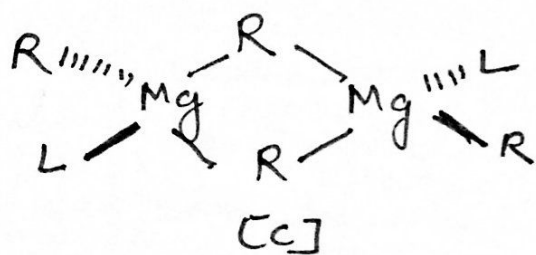
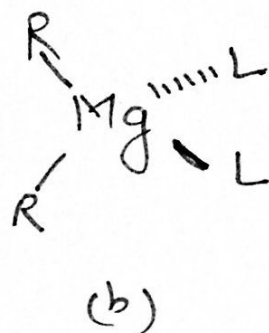
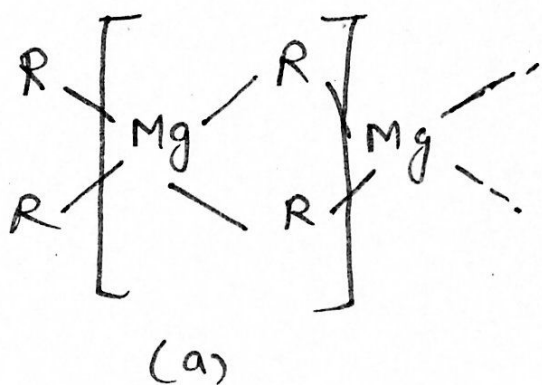


Fig- Solid state structure of R_2Mg ($R = Me, Et$) crystallized in (a) the absence and (b) and (c) the presence of coordinating solvents.