

❁ SECTION-B ❁

Short Questions

Q. NO-2:-

Answer:-

→ (i) :-

→ Ionization energy:-

→ Ionization energy is the minimum amount of energy required to remove the outermost electron from an atom of an element.

→ Ionization energy required to remove first electron from

outermost shell is call 1st ionization energy.

→ The ionization energy required to remove 2nd electron from an atom is called 2nd ionization energy.

→ Phosphorus ionization -----

→ Phosphorus ionization energy is higher than sulphur because the atomic radius of phosphorus is less than atomic radius of sulphur.

→ The nuclear charge on the outermost electrons of phosphorus is more and shielding effect is less so more energy is required to remove electron from

the outermost shell of phosphorus.

→ In Sulphur the atomic radius is high, large and the effect of nuclear charge is less so less energy is required to remove electron.

--- :(ii): ---

→ Answer:-

→ Typical transition metals:-

→ Typical transition metals are these metals that have partially filled d and f - orbital. They are group IB, IV-B, VB, VIB and VII-B and VIII-B.

- They are good conductors.
- They also show paramagnetic property.
- They show variable oxidation state.

→ Non-typical transition metals:-

- Non-typical transition metals are those metals that do not have partially filled d-or f orbital.
- They have completely filled d-orbital.
- But they show resemblance in some properties to transition metals.
- They form complexes which is the property of transition elements.
- They are group II-B and III-B elements.

-(iii):-

Answer:-

→ Wohler's work:-

Wohler's work is referred to as the preparation of Urea in laboratory by Friedrich Wohler in 1828. It was the first time that an organic compound was artificially synthesis. Friedrich Wohler's prepare Urea by heating Ammonium cyanate (NH_3 , HCN).

Importance:-

→ The importance of Wohler's work is that till 1828 there was believed that organic

compounds are only obtained from plants and animals.

→ Organic compounds can not be synthesised in laboratory.

→ But after the work of Wohler's concept were failed.

→ Now millions of organic compounds can be artificially synthesised in laboratory.

-(iv)-

→ Answer:-

→ Metamerism:-

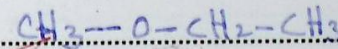
It is the type of constitutional isomerism in which the isomers are different from one another only by

the distribution of alkyl group on either side of functional group.

Example:-



→ Dimethyl ether

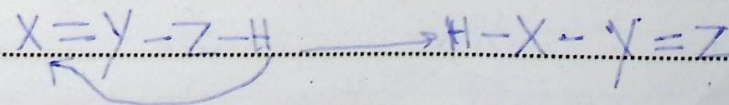
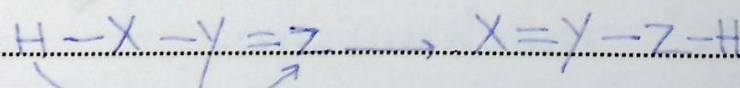


→ 1-methyl propano

Tautomerism:-

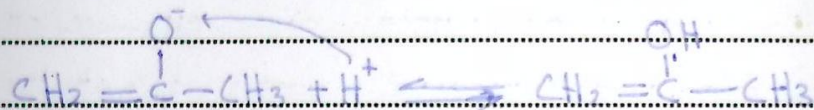
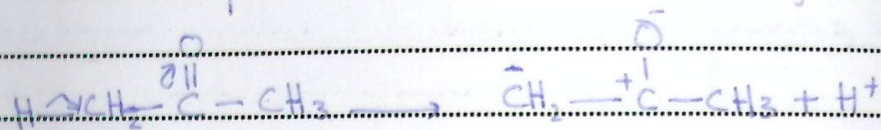
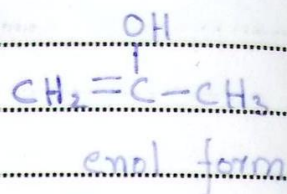
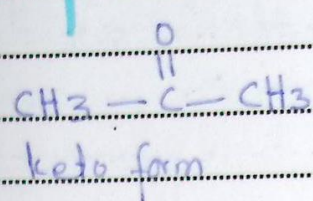
It is the type of functional isomerism in which the shifting of proton occurs.

General sketch:-



In tautomerism the isomers are in dynamical equilibrium.

→ Example:-



→ (vi) :-

→ Answer:-

→ Tertiary alkyl halides usually follow SN^1 mechanism:-

→ Tertiary alkyl halide have stable carbocation
 → It contain three alkyl group which are electron rich group.

→ These alkyl group donate electrons to carbon.
 → The electronegativity of carbon becomes high and it attract a nucleophile very easily.
 → The reaction can proceed easily in two steps following SN^1 mechanism.

→ (vii) :-

→ Answer:-

→ Lucas test:-

→ Lucas test is the test used for detection of degree of alcohol using Lucas reagent (ZnCl_2).
 → When any organic compound is added to a Lucas reagent the reaction start. if

→ It is an alcohol

→ Help to distinguish alcohols:-

→ Lucas test help to distinguish alcohol whether the alcohol is 1° , 2° or 3° alcohol.

→ 3° alcohol:-

→ If the organic compound added to Lucas reagent is 3° alcohol the reaction will proceed in 8 minutes.

→ 2° alcohol:-

→ If the organic compound added to Lucas reagent is 2° alcohol the reaction will proceed in 30 minutes.

1° alcohol:-

→ If the organic compound added to Lucas reagent is 1° alcohol the reaction will complete in more than 1 hour.

—: (X) :—

→ Answer:-

→ Effect of pH on enzyme:-

→ The enzymes are protein in nature.

They are very sensitive to change in pH of the cell. Every enzyme have specific pH.

On its specific pH the

enzyme work best.
 → when pH of the the cell rises the enzymes of cell bear up to some extent but farther rise in pH the enzymes do not work properly, because by rise in pH the acidity of cell decrease and become more basic.
 → Similarly with fall in pH the enzymes denature.

→ Effect of temperature:-

→ Enzymes activity is seriously affected by change in temperature.
 → Upto some extent the activity of enzymes increases i.e. the rate of reaction

increase.

→ But on constant increase in temperature the shape of enzyme distorts and do not work properly.

— (viii) —

→ Answer:-

→ Tollen's & Fehling's test:-

→ The Tollen's and Fehling's tests are the important tests of Aldehydes.
 → They are only ~~occur~~ in Aldehydes.

→ Importance:-

→ They are used to distinguish between ketone's

and aldehyd's

SECTION-C

Long Questions

Q. NO. 4:-

→ Answer:-

Chemical reaction of alkenes:-

→ Important chemical reactions of alkenes are

→ Hydrogenation

→ Halogenation

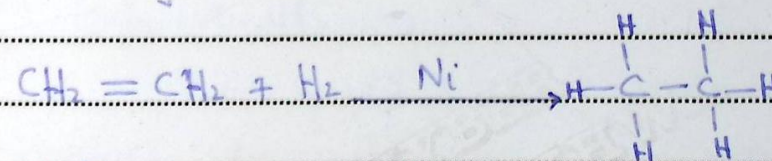
→ Hydration

→ Halohydration
→ Hydrohalogenation etc.

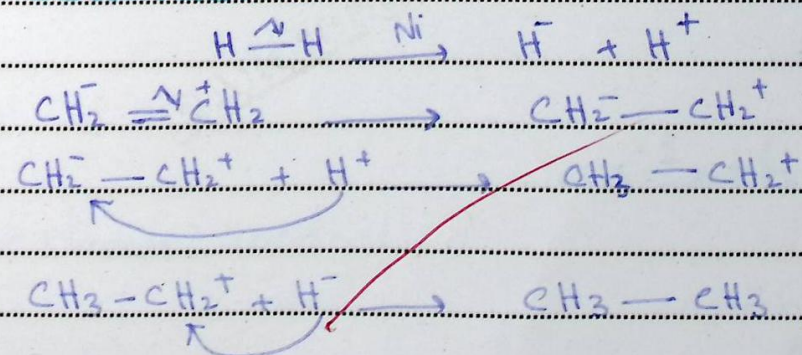
→ Hydrogenation:

→ Hydrogenation means addition of hydrogen to alkenes.

→ Alkenes undergoes hydrogenation in the presence of Nickel catalyst.

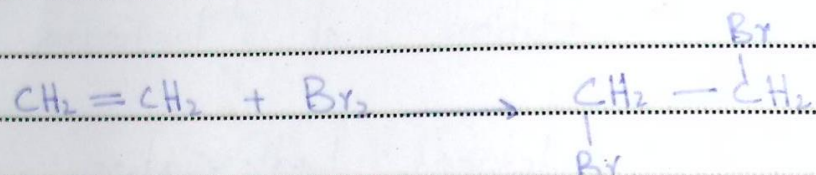


Mechanism:-

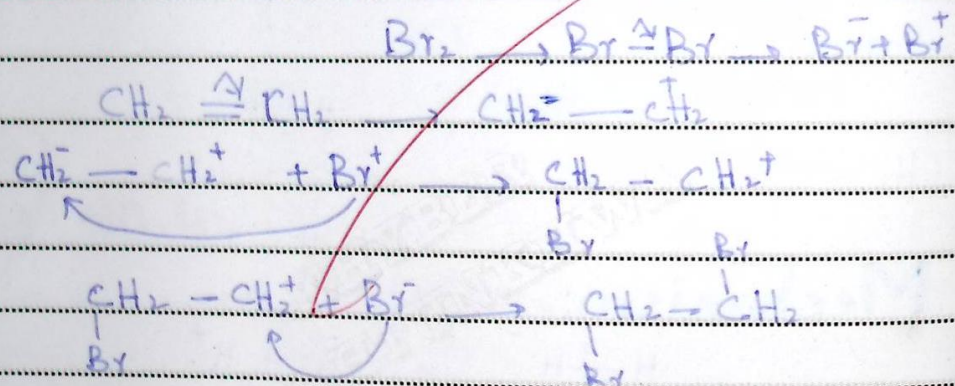


→ Halogenation:

Halogenation means the addition of halogens to an alkene.

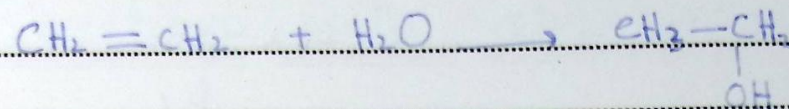


→ Mechanism:

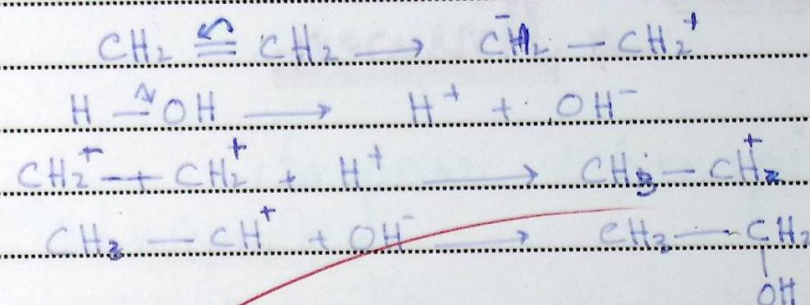


→ Hydration:

Hydration means addition of water to an alkene.

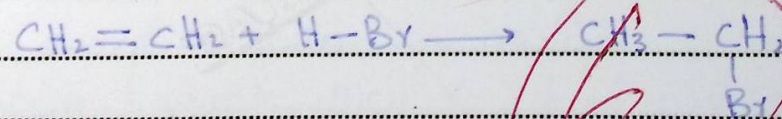


Mechanism:

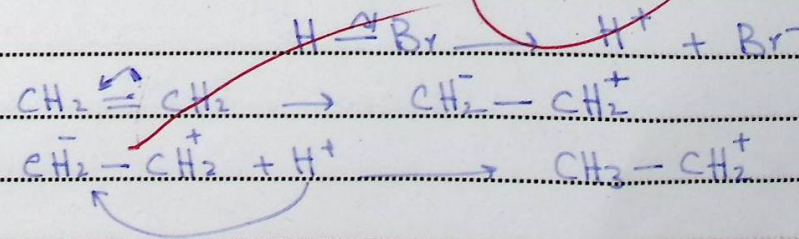


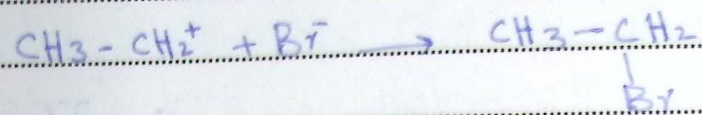
→ Halohydration:

Halohydration means addition of halogen acid to an alkene.



Mechanism:





→ Q.No.5:-

→ Answer:-

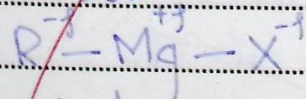
→ Grignard's reagent:-

→ Grignard's reagent is an organometallic compound.

→ It helps in the production of alkanes, alkenes, cycloalkanes, aldehydes and ketones etc.

→ The Grignard's reagent is formed when alkyl group is reacted with any metal.

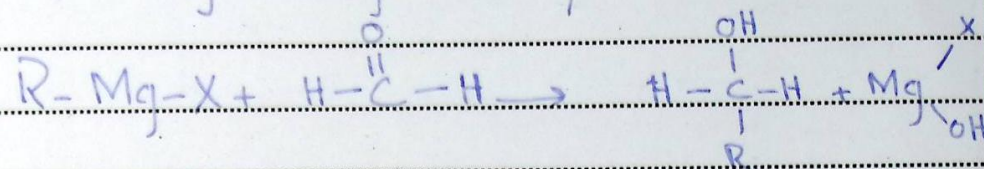
→ Represented as:-



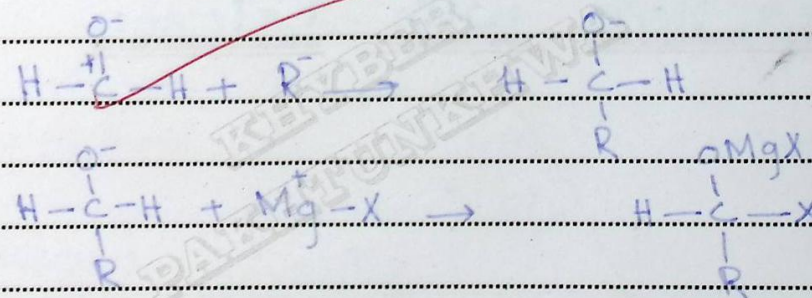
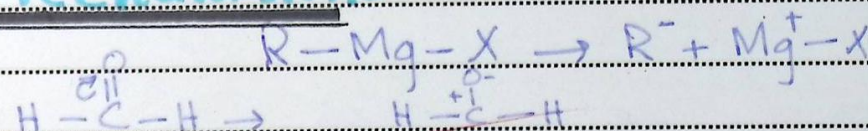
→ The bond between R-Mg and Mg-X is highly polar covalent bond.

→ Reaction with aldehyde:-

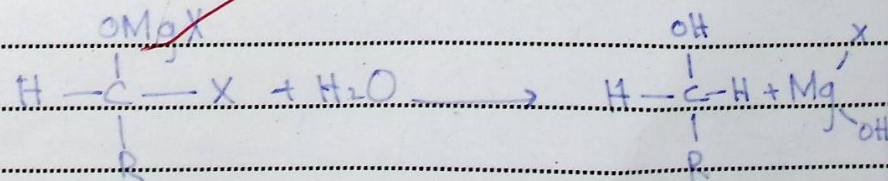
→ Grignard reagent react with aldehyde in following way:-

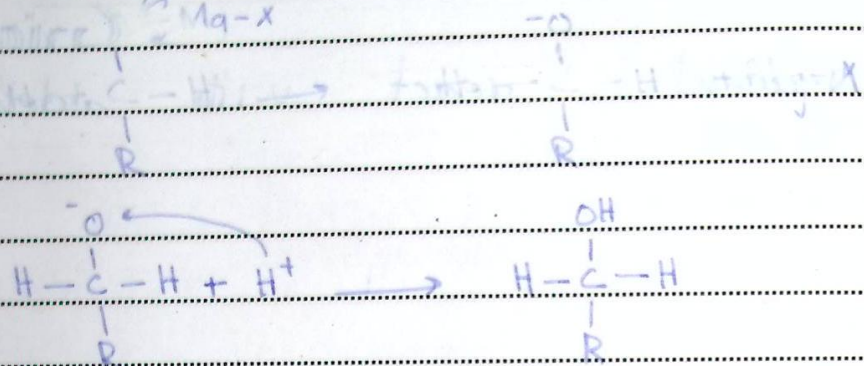
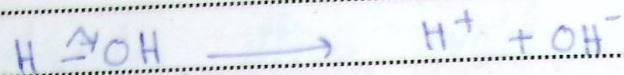


Mechanism:-



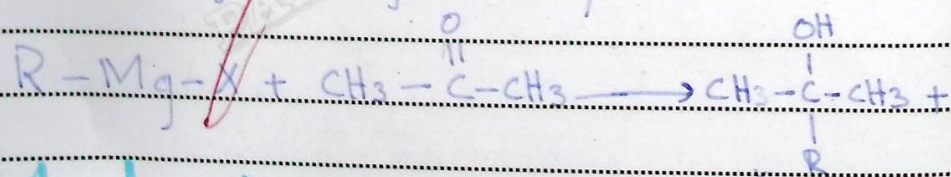
→ Intermediate is intermediate. further hydrolyzed in acidic medium.



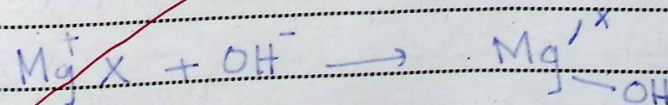
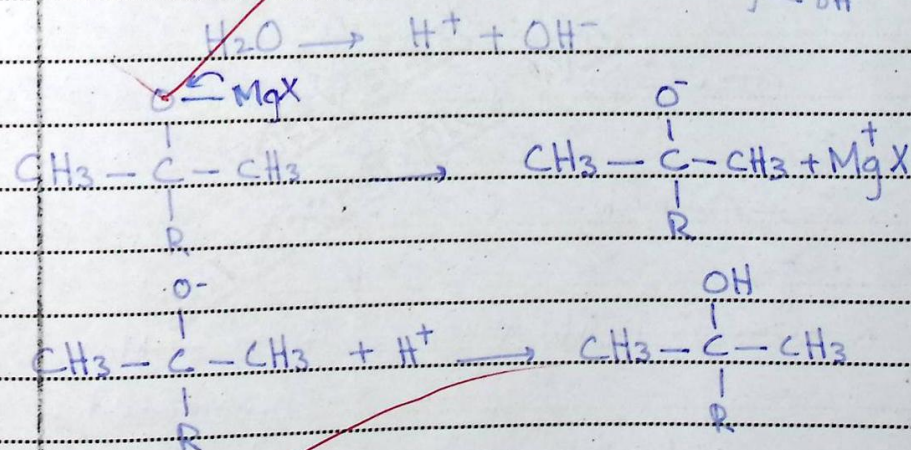
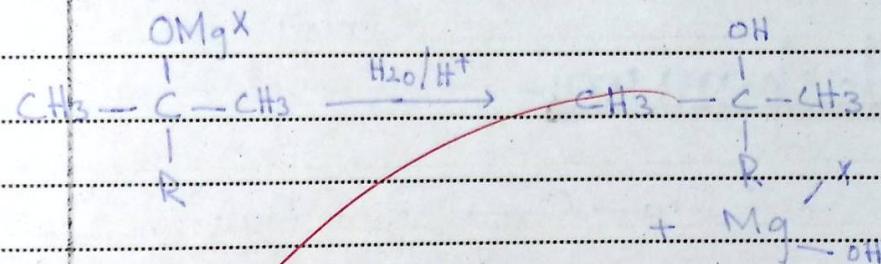
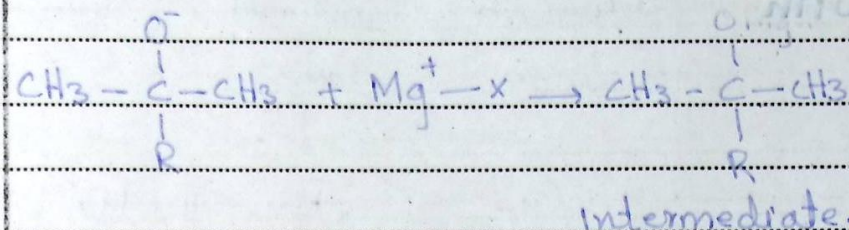
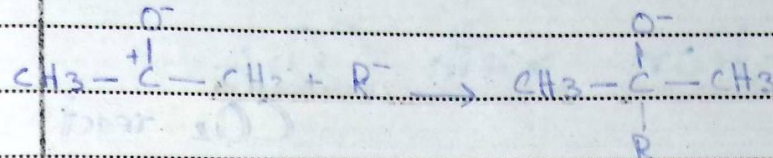
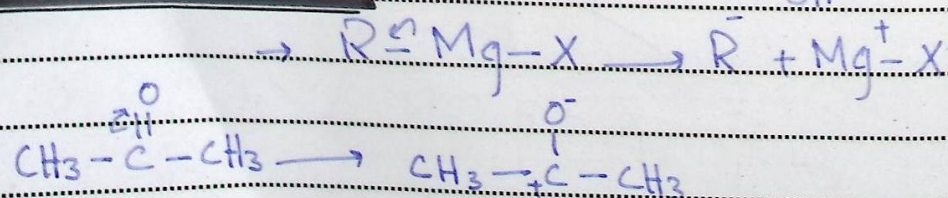


Reaction with ketone:-

Grignard reagent react with ketone in following way.

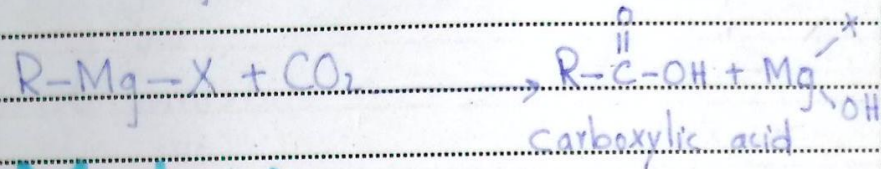
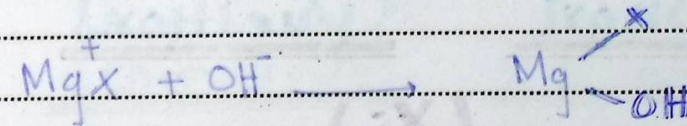
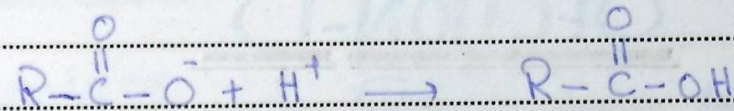
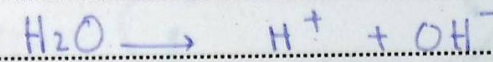
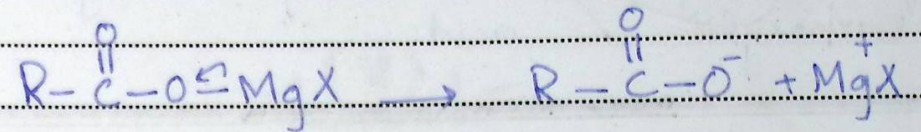
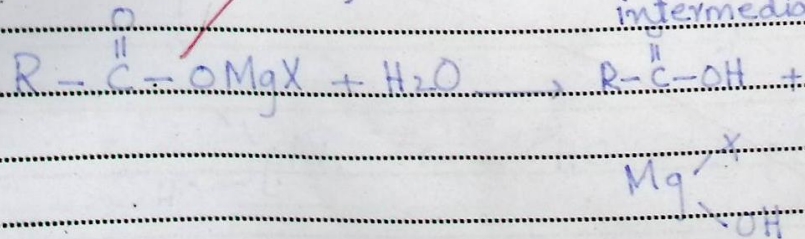
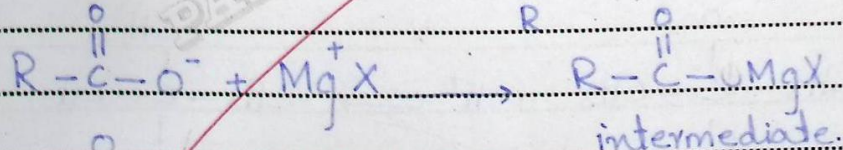
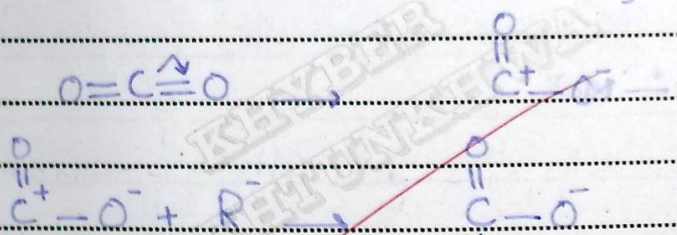
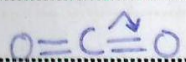
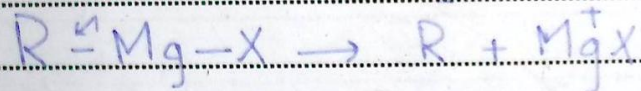


Mechanism:-



Reaction with CO₂:

→ CO₂ react with grignard reagent in the following way-

Mechanism:

→ Product of reaction with aldehyde:-

→ Reaction of grignard reagent with aldehyde give alcohol (Formaldehyde → 1° alcohol)
Higher give → 2° alcohol

→ Product of reaction with ketone:-

→ Reaction of grignard reagent with ketone give

alcohol. (3° alcohol)
 Product of reaction with CO_2 :-
 of ~~grignard~~ reagent give
 carboxylic acid.

SECTION-B

Short Questions

-(Xi):-

Uses of (PVC):-

→ It is used in imitation leather material and roofing material.
 (b) The right form of PVC is used for construction of bottles, pipes and windows.

(3) It is used in electrical wires.

(4) It is used in floor covering.

-(v):-

→ Answer:-

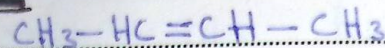
→ Necessary & sufficient conditions for geometrical isomerism:-

isomerism is also called cis-trans isomerism.

→ It is only possible in alkenes.

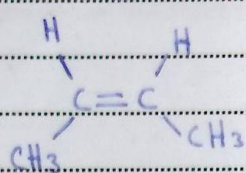
→ Geometrical isomerism in alkenes is possible if $(\text{C}=\text{C})$ each carbon possess different atom or group of atoms.

→ Example:-



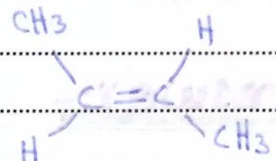
→ 2-butene / But-2-ene

→ The geometrical isomers of 2-butene are:



cis-but-2-ene

and



trans-but-2-ene

SECTION-C

Long Questions

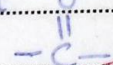
Q.No.6:-

→ Answer:-

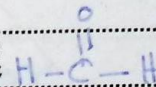
→ Structure of aldehyde and ketone:-

Aldehyde and ketone both are carbonyl compounds.

→ Both contain carbonyl group



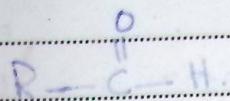
→ The simplest aldehyde is formaldehyde.



→ The aldehyde contain an one side of carbon a hydrogen and on the other side a (alkyl group).

→ The general formula of aldehyde can be written

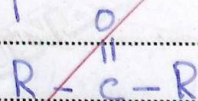
as:-



The ketones are slightly different from Aldehyde as on one side of Carbon ketone contain R group and on the other side also contain R group. The simplest ketone is acetone.



The general formula of ketone is:-



Oxidation reaction of aldehydes ketone:-

→ In oxidation of aldehyde weak oxidizing agent is used like $KMnO_4$.

→ In oxidation of ketone strong oxidizing agent is used. like $K_2Cr_2O_7$...