

{SECTION B}

{Ques 2}

(i)

ANSWER:

IONIZATION ENERGY:

Def:

The ionization energy is the amount of energy required to remove the valence electron from gaseous atom.

FACTORS AFFECTING:

The factors that affect the ionization energy is;

- Atomic radius
- Shielding effect
- Electronegativity
- nuclear charge

REASON FOR HIGHER IONIZATION ENERGY OF PHOSPHORUS:

As we move from left to right, in the period, the ionization energy decreases due to increase of nuclear charge, decrease of atomic radius, but unusual sequence is observed in period III, the ionization energy of phosphorus is greater than sulphur, the valence sub-shell of sulphur is partially filled, which is unstable and readily lose electron to gain stability, while the valence subshell of

phosphorus is half filled which is stable & do not readily lose electron.

That's why Ionization energy of phosphorus is higher than sulphur.

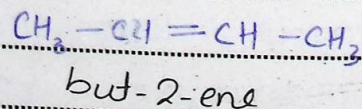
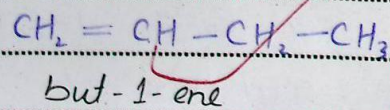
iv

ANSWER:

METAMERISM:

The isomerism in which the isomers have same molecular formula but differs from one another by number of carbon atoms on both sides of the functional group

Example:



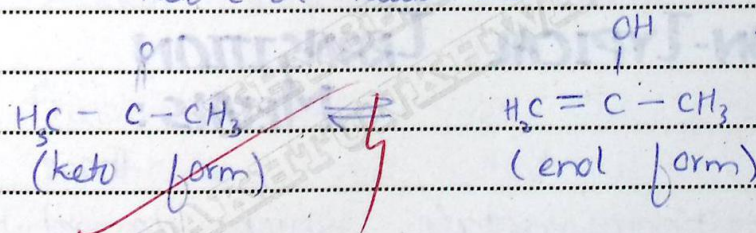
TAUTOMERISM:

The isomerism in which the two isomers exist with in equilibrium with one another is known as tautomerism.

- The migration of α -hydrogen occurs in tautomerism

Example:

keto-enol tautomerism



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ANSWER:

TYPICAL TRANSITION METALS:

Those

transition metals which have partial filled d-orbital, are called typical transition metals.

The typical transition metals exhibit all the properties of transition metals like forming complexes, forming alloys etc.

Example:

Fe, V, Cr

NON-TYPICAL TRANSITION METALS:

Those

transition metals which do not have partial filled d-orbital, but have half filled and completely filled d-orbital is known as non-typical transition metal.

The non-typical transition elements do not exhibit all the properties of transition metals.

Example:

Zn, Hg, Cd

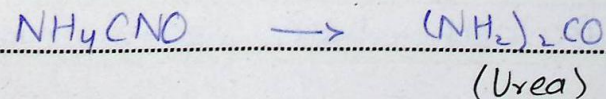
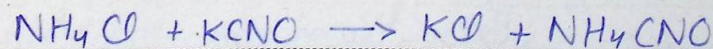
iii

ANSWER:

FRIEDRICH WOHLER'S WORK:

Friedrich Wohler was the first that synthesize urea, that is organic compound, in the laboratory from inorganic compounds.

Reactions:



IMPORTANCE:

Before the Wohler's work, it was thought that organic compounds can only be obtained from natural sources, but after Wohler's work, the doors to the synthesis of organic compounds in the laboratories were opened.

After Wohler's work, large number of organic compounds are artificially synthesized in laboratories.

ANSWER:

GEOMETRICAL ISOMERISM:

The isomerism in which the isomers have same molecular

formula but differs in arrangement of atoms in space and properties is known as geometrical isomerism.

NECESSARY CONDITION:

The necessary conditions for geometrical isomerism is;

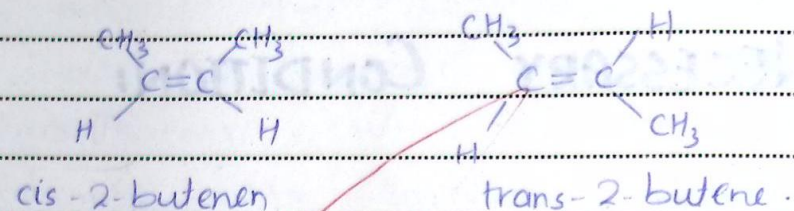
Restricted Rotation:

One of the necessary condition for geometrical isomerism is restricted rotation, otherwise the isomer will break if there is no restricted rotation of the double bond.

Two Different Groups:

The other condition for the geometrical isomerism

is that there must be two different groups attached to the double bond carbons atoms.



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ANSWER:

LUCAS TEST:

The Lucas test is used for the identification of 1° , 2° , 3° alcohols.

LUCAS REAGENT:

Anhydrous Zn and HCl is the Lucas reagent used in Lucas test.

Determination Of Alcohols:

Tertiary Alcohol:

When 3° Alcohol is treated with Lucas reagent, it readily forms the milky cloud which confirms the 3° Alcohol.

Secondary Alcohol:

When 2° Alcohol is treated with Lucas reagent, the milky cloud is formed in 5-10 min which confirms the 2° Alcohol.

Primary Alcohol:

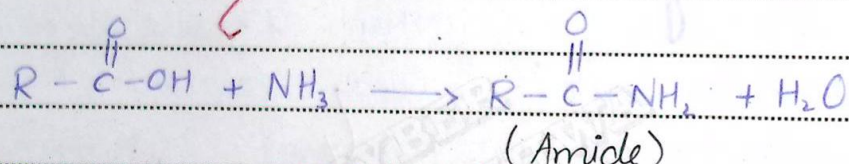
The 1° Alcohol do not react with Lucas reagent at normal condition.

(ix)

ANSWER:**Conversion Of Carboxylic Acids Into Amides:**

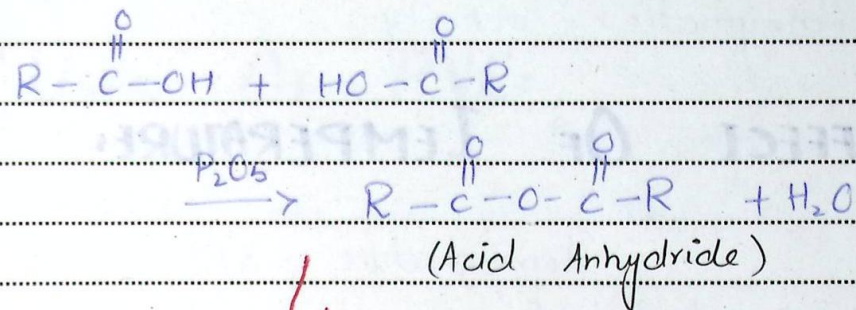
When carboxylic acids react with NH_3 , the product form is amides.

Reaction:

**Conversion Of Carboxylic Acids Into Acid Anhydrides:**

When two carboxylic acids react in the presence of P_2O_5 , the product form is acid anhydride, water is also removed.

Reaction:

**ANSWER:****EFFECT OF PH:**

The pH greatly effect the p activity of the enzyme. If the pH is increased then the enzymatic activity also increases and if pH is decrease, the enzymatic activity also decrease, but the increase of the pH is upto an optimum level, after that

there is no increase in the enzymatic activity.

EFFECT OF TEMPERATURE:

Temperature also effect the activity of enzyme, if the temperature increases, the collisions between the molecules also increase, as a result, the rate of reaction and enzymatic activity increases, if temperature is increased beyond the optimum level, then the enzyme starts to denature.

Similarly, if we decrease the temperature, the activity of the enzyme also decreases.

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ANSWER:

USES OF PVC:

The polyvinyl chloride is uses for;

- It is used for making bottles.
- It is used to make iresistive.
- It is used to make resin.
- It is used to make plastic bags.
- It is used to make leather bags.
- It is used to make surgical instruments.

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ANSWER:

IR SPECTROSCOPY APPLICATIONS:

The applications of IR spectroscopy is given below;

Medical Uses:

IR spectroscopy is use for medical purposes, it is used in machines, also use for the detection of diseases.

Finger Prints:

IR spectroscopy is use for the detection of finger prints, so it is used by crime investigation departments.

Detection of Impurities:

IR spectroscopy is use for the detection of the impurities in materials.

{SECTION C}

{QUE 4}

ANSWERS:

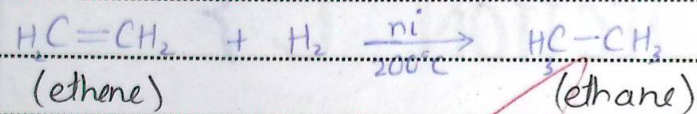
REACTIONS OF ALKENES:

The important chemical reactions of alkenes are given below;

Hydrogenation:

Addition of hydrogen occurs in the presence of Ni/Pt/Pd catalyst at 200°C and the product is corresponding alkane

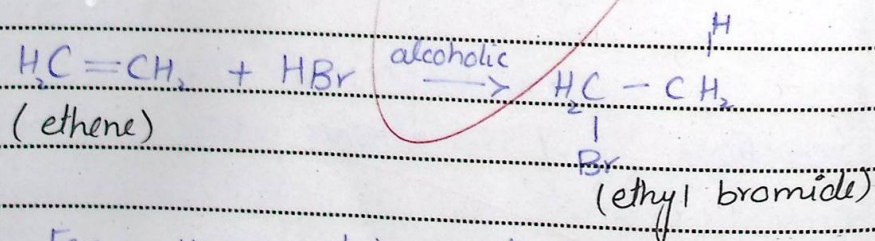
Reaction



Hydrohalogenation:

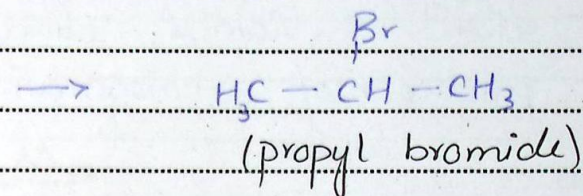
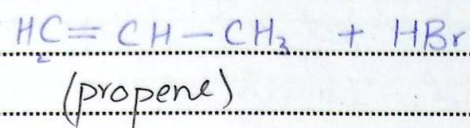
Addition of hydrogen acid produce alkyl halide in alcoholic medium.

Reaction:



For unsymmetric alkenes,

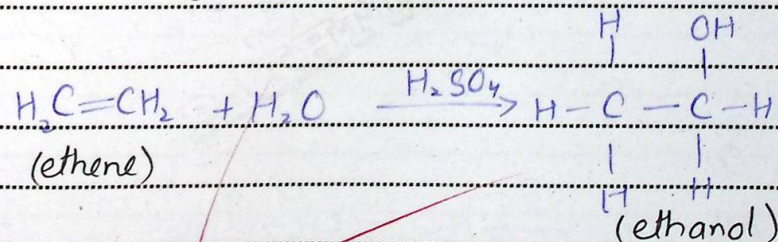
Markonikov's rule is obeyed.



Hydration:

The hydration of alkenes occurs in the presence of H_2SO_4 at 170°C and the product is alcohol.

Reaction:



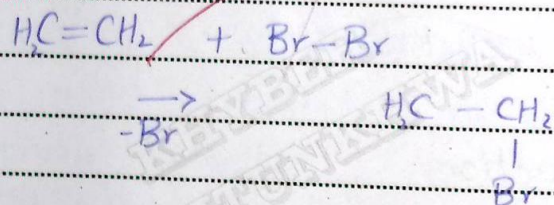
For unsymmetric alkenes, Markonikov's rule is followed.

Halogenation:

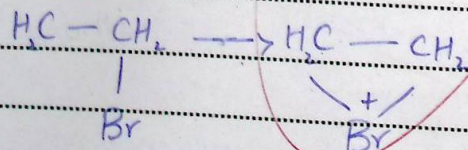
Addition of halogen occur when alkene is dissolved in (CCl₄) inert solvent, vicinal dihalides is the product of halogenation of alkenes.

Reactions:

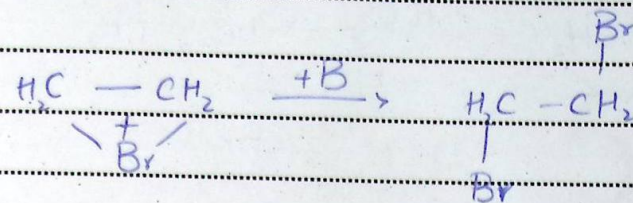
Step 1:



Step 2:



Step 3:

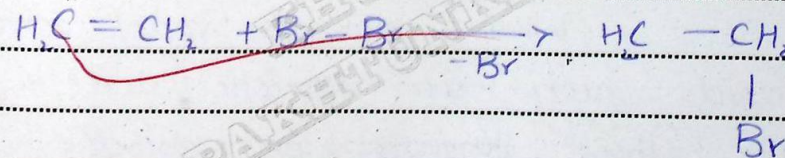


Halohydrin:

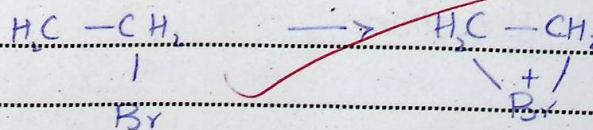
When halogenation of alkene occur in aqueous medium, then halohydrin is formed.

Reaction

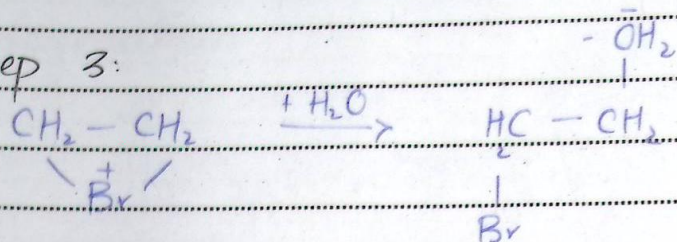
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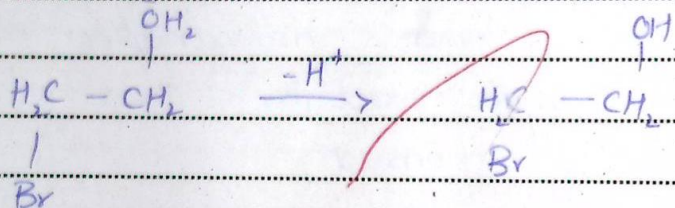
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Step 3:



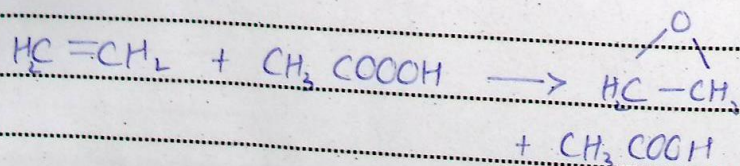
Step 4:



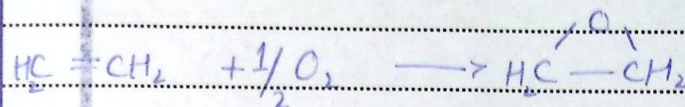
Epoxidation:

When alkenes react with peracids such as peracetic acid, cyclic ethers knowns as epoxides are produced.

Reaction:



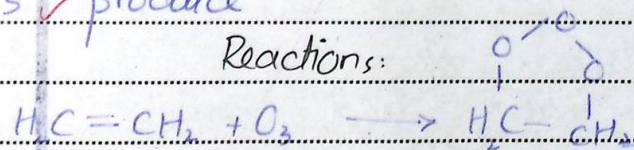
At industrial level, oxygen is used to produce epoxides



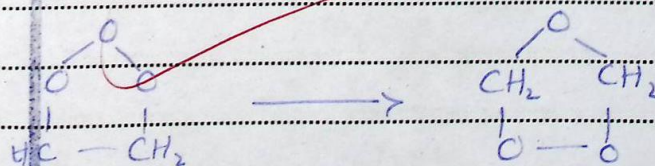
Ozonolysis:

When O_3 gas is passed through inert solvent in which alkene is dissolved, molozoneide is produce

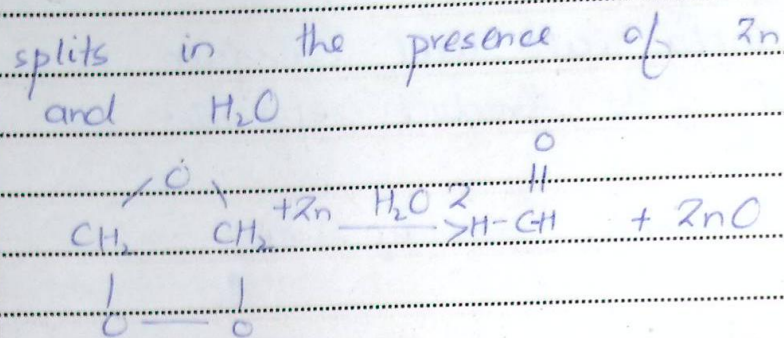
Reactions:



molozoneide rearrange into ozonide.



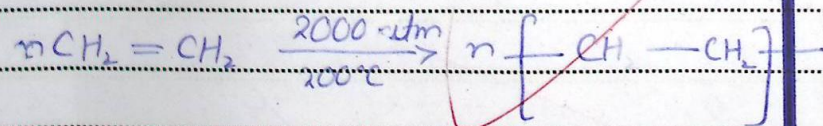
Ozonide is unstable &



Polymerization:

The process in which monomers of alkenes combine together to form polymers. The reaction takes place at high temperature and pressure.

Rxn:



{QUE 5}

ANSWER:

GRIGNARD'S REAGENT:

Grignard's reagent is an organometallic compound.

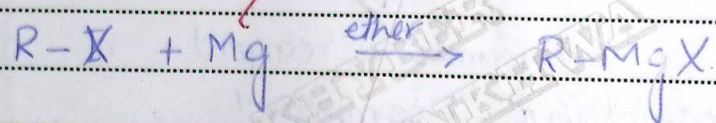
$R-MgX$ is known as the Grignard's reagent named after Victor Grignard who discovered it.

Grignard's reagent is used for the preparation of many organic compounds.

PREPARATION OF GRIGNARD'S REAGENT:

When freshly prepared magnesium is passed through alkyl halide in dry or anhydrous ether, Grignard's reagent is produced.

Reaction



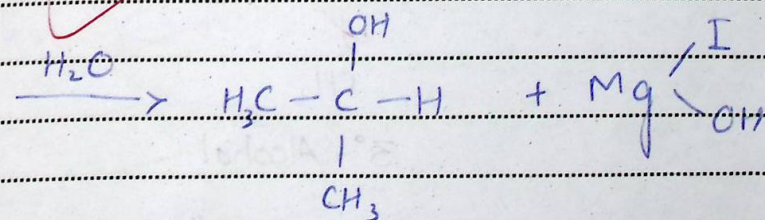
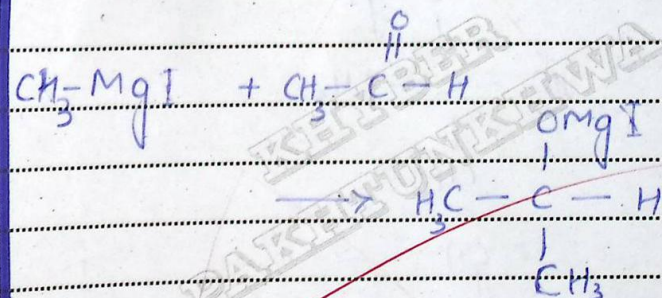
Dry ether is very necessary in the preparation because it dissolves Grignard's reagent through solvation & also provides the medium.

CHEMICAL REACTIONS:

ALDEHYDE:

Aldehyde reacts with Grignard's reagent to produce addition product which on acid hydrolysis produces 1° or 2° alcohol.

Reaction:

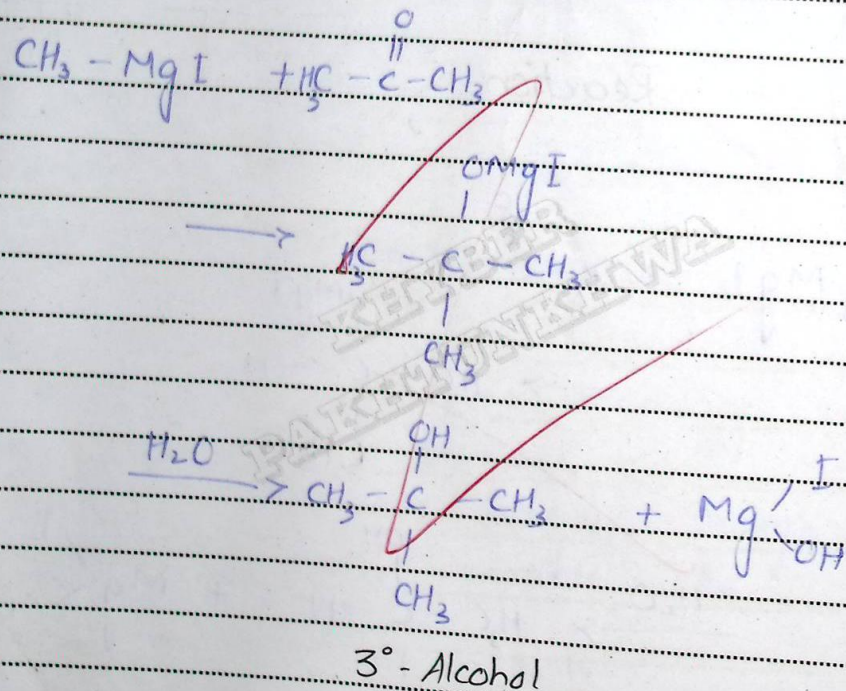


2° Alcohol

KETONE:

Ketone react with Grignard's reagent to produce addition product which on acid hydrolysis produce 3° alcohol.

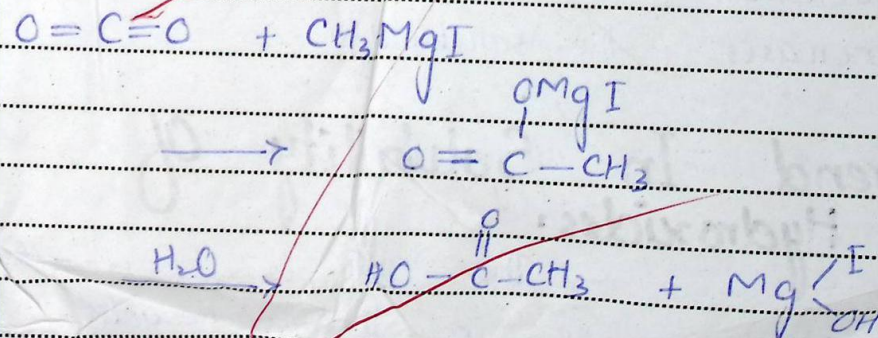
Reaction:



CARBONDIOXIDE:

CO₂ reacts with Grignard's reagent to produce addition product which on acid hydrolysis produce carboxylic acid.

Reaction



QUE 3

ANSWER:

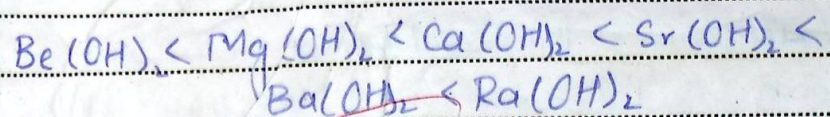
SOLUBILITY OF ALKALINE EARTH METALS:

The solubility of alkaline earth metals depend upon lattice energy and solvation so increase in lattice energy decrease the solubility while solvation increases the solubility.

Trend In Solubility of Hydroxides:

The OH is a small molecule, so in the hydroxides of alkaline earth metal, the lattice energy difference is not greater & also they have high

solvation, due to these reasons the hydroxides of alkaline earth metals are very soluble, the solubility of the hydroxides of the alkaline earth metal increases down the group.



Trend In Solubility of Sulphates:

The SO_4^{2-} is a bigger molecule, so sulphates of alkaline earth metal have high lattice energy, also have low solvation, due to these reasons the sulphates of alkaline earth metals are not that much soluble, the solubility of the sulphates decreases down the group.

Trend In Solubility of Carbonates :

The CO_3^{2-} is a larger molecule, so in Carbonates of alkaline earth metals they have high lattice energy and have low solvation, due to these factors, the solubility decrease down the group & they are also not that much soluble.

