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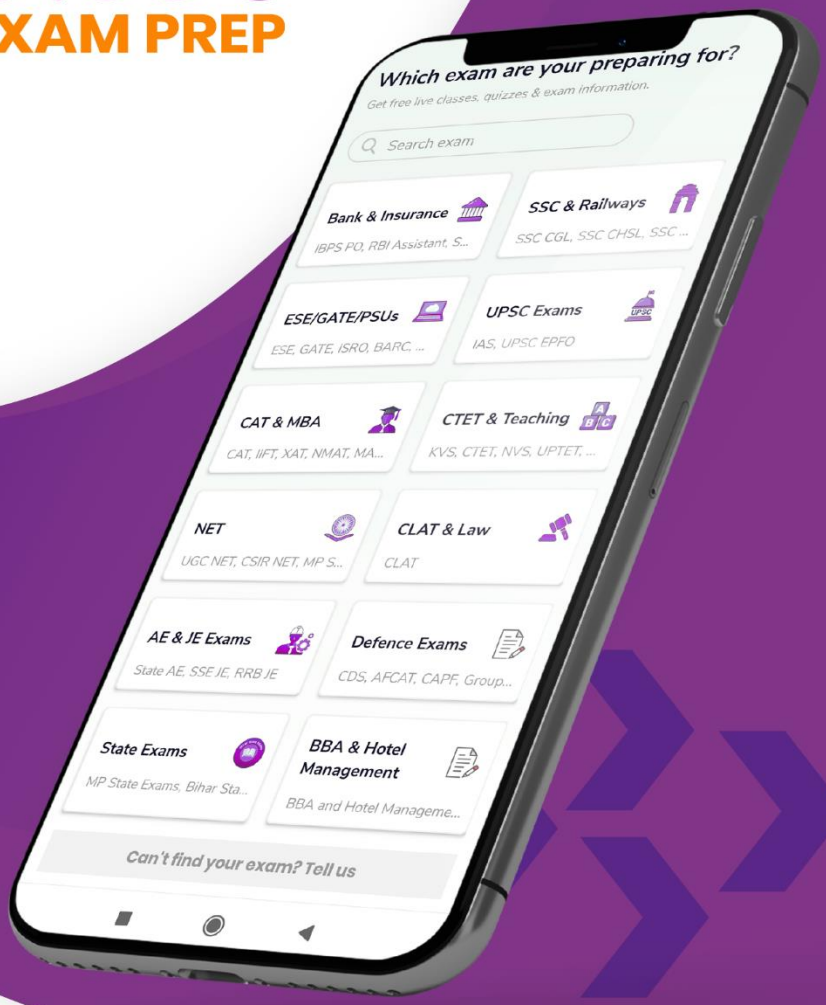

Chemistry Hydrogen Derivatives of Hydrocarbons English PDF

Hydrogen Derivatives of Hydrocarbons

What are Hydrocarbon Derivatives?

You must first understand "regular" hydrocarbons in order to define a hydrocarbon derivative. Just hydrogen and carbon atoms make up the compounds or molecules known as **hydrocarbons**. Hydrocarbons are the starting material for hydrocarbon derivatives, however, at least one of the hydrogen atoms is changed in a hydrocarbon derivative. Fuel, fragrances, and flavour extracts are just a few of the products that are made with hydrocarbon derivatives.

Types of Hydrocarbon Derivatives

hydrocarbons consist of molecules made up of hydrogen and carbon atoms. These compounds consist of hydrogen atoms surrounding one or more carbon atoms that are linked together. The four primary categories of hydrocarbons are as follows:

- **Alkanes:** only have one bond between each carbon atom.
- **Alkenes:** have at least one double carbon-atom bond.
- **Alkynes:** At least one triple bond between the carbon atoms is present in alkynes.
- **Aromatic hydrocarbons:** take the form of rings

Difference between Hydrocarbon and Hydrocarbon Derivatives

When at least one hydrogen atom in a hydrocarbon derivative is replaced with another element or atoms, such as oxygen, nitrogen, or any halogen atom, hydrocarbon derivatives differ from hydrocarbons. The periodic table's group 17 contains halogen atoms.

Examples of Hydrocarbon derivatives

The functional groups of hydrocarbon derivatives are frequently used to categorise them. Examples of hydrocarbon derivatives are listed below according to their functional groups.

Ethyl bromide:

- It is colourless and used as a local anaesthetic and in organic synthesis.

Chloroform ($CHCL_3$):

- Discovered by Liebig, used as an anaesthetic in surgery.
- Always stored in a dark-coloured bottle as it gets oxidised with the sunlight and forms a poisonous gas known as Phosgene.
- It reacts with concentrated HNO_3 to form Chloropicrin, a poisonous gas used in the war.

Carbon tetrachloride (CCL_4):

- Used as a fire extinguisher, used as a solvent for the fats, and oils in the industry.

Freon:

- The chlorofluorocarbon compounds of methane and ethane are collectively known as Freon.
- They are produced by refrigerators, A.C. and propellants.
- They cause the depletion of Ozone.

Dichloro diphenyl trichloroethane (DDT):

- Discovered by Paul Muller and it is used as an insecticide, widely used against the mosquito and lice.
- It is highly stable and is not decomposed easily in the environment that why it is banned in several countries.

P-dichloro benzene:

- Used as an insecticide, germicide and in deodorant and moth repellent.

Perfluoro carbons (PFC):

- Used as an electric insulator, lubricant, dielectric, and heat transfer media in high voltage.

ALCOHOLS

Methyl alcohol (CH_3OH):

- known as wood spirit or wood naptha.
- Used for the denaturing of alcohol (methylated spirit is denatured ethyl alcohol).
- Used as alcohol-petrol fuel, automobile antifreeze mixtures and in the manufacturing of drugs, dyes and perfumes etc.

Ethyl alcohols (C_2H_5OH):

- Known as alcohol, the spirit of wine or grain alcohol.
- Used as a solvent in the paint industry.

Ethylene glycol:

- Used as an antifreeze in automobile radiators and as a cooling agent in aeroplanes instead of water.
- Its dinitrate is used as an explosive with trinitroglycerine.

Glycerol

- Present in almost all animal and vegetable oil and fats as glycerides.
- It is hygroscopic in nature and used in the manufacturing of cosmetic and transparent soaps, as a lubricant for watches and clocks.

Phenol (C_6H_5OH):

- Commonly known as carbolic acid or benzenol and prepared by the middle oil fraction of Coal Tar.
- Used in the preparation of drugs such as salol, aspirin, salicylic acid and phenacetin.

ALDEHYDES

Formaldehyde (HCHO)

- It's 40% dilute solution which is known as formalin, is used as an insecticide, germicide and preservative for the biological specimen.
- Used in the leather industry for tanning and in the manufacturing of synthetic dyes and Bakelite.

Acetaldehyde (CH_3CHO)

- Used in the silvering of mirrors and in the manufacturing of paraldehyde and metaldehyde.
- Chloral or Trichloro acetaldehyde
- Used as a sleep-producing drug and as a powerful stimulant

Acrolein or Acraldehyde

- Used in tear gas and as a warming agent to find out leakage if any of methyl chloride.

KETONES

Acetone or Dimethyl ketone (CH_3COCH_3)

- It is the first member of the ketone series
- It Is one of the constituents of nail polish.

- Chloretone used as a medicine is obtained by the reaction of acetone with chloroform in the presence of potassium hydroxide.

CARBOXYLIC ACID

Formic acid (HCOOH)

- Found in red ants, in the strings of bees and wasps.
- It is corrosive and produces blisters on the skin.
- Used in the preparation of fruits and as a medicine for the treatment of Gout.

Acetic acid

- Dilute acetic acid is used as vinegar and concentrated acid is used as a solvent.
- Prepared by the fermentation process

Oxalic Acid

- It is used to remove ink stains from the cloth.
- Its salt potassium ferrous oxalate is used in photography.
- It occurs in rhubarb, sorrel and other plants of the oxalic acid group in the form of potassium salts.

Lactic Acid

- It is a monohydroxy acid, present in milk
- When we do vigorous physical activity lactic acid is produced which causes pain in muscles.

Tartaric Acid

- It occurs in grapes, tamarind and berries.
- Used in the dyeing industry and making baking powders.
- Rochelle salt(sodium potassium tartrate) is used in the preparation of the Fehling solution.

Citric Acid

- In Free states, it is found in citrus fruit such as lemon, lime, orange and galgal.
- Used in making beverages and as a mordant in dyeing and calico–printing.

Salicylic Acid

- It is poisonous and has antiseptic properties.
- Used in the azo dyes and aspirin preparation

Acetoacetic Acid

- It is a colourless liquid, and on decomposition, it gives acetone and CO_2.
- It occurs in excess in the urine of diabetic patients.

NITRO COMPOUNDS

Nitrobenzene

- It is a pale yellow oily liquid with a strong smell of bitter almonds.
- It is also known as the oil of mirbane.
- Used in the preparation of aniline, benzidine, 1, 3, 5-trinitro benzene and azodyes.

1, 3, 5-trinitrobenzene or TNB

- It has greater explosive power than TNT and is used in making explosives.

Trinitrotoluene (TNT)

- It is a pale yellow crystalline solid prepared by nitrating toluene with fuming nitric acid and fuming sulphuric acid mixture.
- Used as an explosive in bombs, shells and torpedos.

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