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**COURSE CODE:** CHM 102

**COURSE TITLE:** GENERAL CHEMISTRY II

QUESTION 1

1. Suggest possible formulas for a molecular ion (m/z) of 105.

Answers

Given 105 is odd and it has a nitrogen

N = 14amu

Mass number of carbon:

is the number of mole for carbon.

For hydrogen: ,

 is the number of mole for hydrogen

The formula is C7H7

To find hydrogen deficiency

Oxygen was introduced

Taking O = 16

Mass number of oxygen:

is the number of carbon atom.

is the number of hydrogen atom.

The formula is C6NOH3

To find hydrogen deficiency

1. What is the importance of organic compounds?

Answers

The following are importance of organic compounds

* **In Nucleic Acid**

Nucleic acids are mainly composed of many elements but mainly coal and hydrogen, although there are also oxygen atoms in their sugars. They are found in abundance in all living things, where their function is to create and encode, and then to store information in the nucleus of all living organisms on earth.

* **In Carbohydrates**

A carbohydrate is a biological molecule consisting of carbon, hydrogen and oxygen. They are very important in living organisms. They provide energy and can be seen as stored sugar in plants and anthropods (in form of polysaccharides). Saccharides are important in the molecules that make up the DNA. They also aid in immune system, in fertilization, in blood clotting and in prevention of pathogenesis.

* **As the Basis of Food**

Food materials are created from carbon compounds through carbohydrates, proteins and fats. Organic molecules are found in all food consumed by an individual. A large number of organic molecules are needed to keep cells and tissues healthy.

* **In Metabolism**

Metabolic reactions allow organisms to grow and reproduce, maintain their structures, and respond to environment. Metabolism involves two processes is anabolism and catabolism. That is the construction of components of cells (such as proteins and nucleic acids) and the breakdown of glucose by cellular respiration respectively.

* **Hydrocarbon**

Hydrocarbons are organic compounds made entirely of carbon and hydrogen. They provide a primary source of energy. Some anthropods use the characteristic smell of hydrocarbons to classify or diverse their family

1. Differentiate between homocyclic and heterocyclic compounds.

Answers

|  |  |
| --- | --- |
| Homocyclic compounds  | Heterocyclic compounds |
| * They are compounds that consist only of carbon within the ring.
 | * They are compounds that contain at least one non-carbon atom in the ring.
 |
| * An example is benzene.
 | * An example is heterocyclic amines.
 |

QUESTION 2

1. If the distance of the solvent front is 12.2cm. 2.4cm, 5.6cm and 8.9cm are distances of the different bands respectively. Calculate the Retardation factor of the available bands.

Answers

Solvent front = 12.2cm

a = 2.4cm, b = 5.6cm, c = 8.9cm

Retardation factor, RF

Rfa

Rfb

Rfc

1. Two organic compounds were labelled A and B. A gave a positive test result (dark grey precipitate) to Tollens' test and B decolourises bromine water. Suggest the family to which these organic compounds belong.

Answers

From the test results the family which the organic compounds belong to is the Aldehydes.

1. 2, 4-Dinitrophenylhydrazine test is employed for ketones and aldehydes.
2. List 7 functional groups of organic compounds giving two examples of each group.

Answers

1. Alkanes – E.g. Ethane(C2H6 ) and Propane(C3H8)
2. Alkenes – E.g. Ethene(C2H4) and Propene(C3H6)
3. Alkynes – E.g. Butyne(C4H6) and Ethyne(C2H2)
4. Carboxylic acids – E.g. Pentanoic acid(C5H10O2) and Hexanoic acid(C6H12O2)
5. Alkanols – E.g. Ethanol(C2H5OH) and Propanol(C3H7OH)
6. Esters – E.g. Ethyl ethanoate(CH3COOC2H5) and Methyl Propanoate(C4H8O2)
7. Amines – E.g. Propyl amine(C3H7NH2) and butyl amine(C4H9NH2)