NAME: Oparaocha Freda uloma

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DEPARTMENT: Medicine and surgery

1. **Suggest possible formulas for a molecular ion (m/z) of 105.**
2. Given **105**, since its **105** it is odd and it has a nitrogen To find hydrogen deficiency

Taken N=**14amu** **= (2N + 2-H)**

Therefore, **105-14=91** **2**

To find the mass number of carbon **= [2(7.6) +2-7]**

Therefore, **91÷12=7.6** **2**

Therefore**, 7** is the number of mole for carbon. **= 15.2-5**

For hydrogen **2**

**7×12=84**, therefore **91-84=7** **= 5.1**

Therefore**, 7** is the number of mole for hydrogen

The formula is **C7NH7**

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| Oxygen was introduced To find hydrogen deficiency Therefore, **105-14=91 = (2N + 2-H)**  Taking **O=16 2**  Therefore, **91-16=75 = [2(6.25) + 2-3]**  **75÷12=6.25 2**  Therefore**, 6×12=72 = 12.5-1**  Therefore **72** is the number of carbon atom **2**  **75-72=3 = 5.75**  Therefore **3** is the number of hydrogen atom  The formula is **C6NOH3** |

1. **What are the importance of organic compound**

**IN NUCLEIC ACIDS**

Nucleic are essential biopolymers for all life forms (DNA is included in this category. They are composed of many elements but mainly coal and hydrogen, although there are also oxygen atoms in their sugars. Nucleic acids are the most important of all biomolecules. They are found in abundance in all living things, where their function is to create and encode, and then to store information’s in the nucleus of all living cells of all living organisms on earth.

**IN CARBOHYDRATES**

A carbohydrate is a biological molecules consisting of carbon, hydrogen, and oxygen. In biochemistry, the term is synonymous with a group of elements that may include sugars, celluloses and starch.

Carbohydrates play an important role in living organisms. Polysaccharides serve to store energy and as structural components in production of food. In general, saccharides and their derivatives include many other important biomolecules that play primordial roles in the immune system, in fertilization in blood clotting, and in the prevention of pathogenesis.

In food science, the term carbohydrate can used to define any food that is rich in complex carbohydrate starches such as cereals, pasta, bread, or rich in simple carbohydrates such as candles or sweets.

**AS THE BASIS OF FOOD**

Food materials are created from carbon compounds via carbohydrates, proteins and fat. All the food we consume is reconstituted material and extracts of plants or animals.

Organic molecules make up large portion of the human diet and are found in all food consumed by an individuals. It requires a large number of organs molecules needed to keep cells and tissues healthy.

**IN LIPIDS**

A lipid is a term used to define substances of biological origin that are soluble in solvents. It consists of group of molecules that occur in nature like fats, waxes, sterol, monoglycerides and triyceride, among others. The main functions of lipids include storing energy, signaling lipid and acting as a structural component of cell membranes. Lipids have applications in the cosmetics industry and in the food industry, as well as nanotechnology.

**IN PROTEINS**

One type of organic molecules that must be present in every human’s diet is protein. Proteins are composed of chains of organic molecules called amino acids. The humans body uses a combination of 20 different types of amino acids, arranges in specific sequences to make thousands of unique human proteins present in cells and tissues.

Protein is important in a diet to provide a source of amino acids. Protein is broken down inside the stomach and intestines, and the amino acids that make up the diet protein are absorbed inside the body and are used to make their own protein.

1. **Differentiate between homocyclic and heterocyclic compounds**

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| **Homocyclic compounds** | **Heterocyclic compounds** |
| 1.the ring of homocyclic compounds is made up carbon atoms only | 1.the ring of heterocyclic compounds is made up of more than one kind of atoms |
| 2. Homocycllic compounds have 100% carbon atoms in their ring. | 2.heterocyclic compounds have mainly carbon and, in addition, heteroatoms such as nitrogen, oxygen, and sulphur are found in their ring |
| 3.Alicyclic homocyclic and aromatic homocyclic | 3.alicyclic heterocyclic compound and aromatic heterocyclic |
| 4. Phenol, toluene, naphthalene, and anthracene. | 4.tetrahydrofuran, piperidine, pyridine, furan and pyrrole |

**Question2**

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.**

Solution.

Using the formula:

Retardation Factor= Distance moved by substances.

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| Distance moved by solvent fro |

To find A=2.4cm, B= 5.6cm and C=8.9cm. GIVEN THAT THE SLOVEN FRONT IS 12.2cm

To find a=2.4cm

RF= A = 2.4cm = 0.20

12.2cm 12.2cm

To find b= 5.6cm

RF= B = 5.6cm =0.46

12.2 12.2cm

To find c= 8.9cm

RF= C = 8.9cm =0.73

12.2cm 12.2cm

**B. two organic compound were labelled A and B. A gave a positive test result (dark grey precipitate) to tollens test and B decolorizes bromines water. Suggest the family to which these organic compounds belong.**

Answer.

A=‘’Aldehydes’’

B= Bromine water is able to be decolorized by unsaturated compounds like ‘’alkenes’’ and ‘’alkynes’’.

**C. 2, 4-dinitrophenylhydrazine test is employed for** carbonyl functionality for a ketone (alkanes) or aldehyde functional group.

**D. list 7 functional groups of organic compounds giving two examples of each group.**

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| **FUNCTIONAL GROUP** | **EXAMPLES** |
| -C-H (alkanes) | Ethane(H3C-CH3) and pentane (C5H12) |
| >C=C< (alkenes) | Ethene(H2C=CH2) and pentene(C5H10) |
| -C≡C- (alkynes) | Ethyne (HC≡CH) and pentyne(C5H8) |
| -OH (alkanols) | Methanol (CH3OH) and Ethanol (C2H5OH) |
| -COOH (alkanoic acids) | Ethanoic acid (CH3COOH) and propionic acid(C2H5COOH) |
| CHO (alkanals) | Acetaldehyde or ethanol(CH3CHO) and butyraldehyde or butanal (C3H7CHO) |
| >C=O (alkanones) | Propanone (CH3COCH3) and Butanone(C2H5COOCH3) |