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COURSE CODE: CHM 102

QUESTION 1:

1. A m/z 10. This is an odd molecular ion which means it contains an N atom.

Therefore,

$$105-14=91$$

$$\frac{91}{12}=7 remainder 7$$

Therefore a possible molecular formula is C7H7N

1. Importance of organic compounds

1- In nucleic acids

Nucleic acids are essential biopolymers for all life forms (DNA is included in this category).

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 in the nucleus of all living cells of all living organisms on Earth.

2- In carbohydrates

A carbohydrate is a biological molecule 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 plants and arthropods, for example. A type of saccharide is important in the molecules that make up the DNA.

3- As the basis of food

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

Organic molecules make up a large portion of the human diet and are found in all food consumed by an individual.

4- In lipids

A Lipid Is a term used to define substances of biological origin that are soluble in solvents.

It consists of a group of molecules that occur in nature like fats, waxes, sterols, monoglycerides and triglycerides, 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.

5- it is important in fuels eg coal, wood, natural gas.

6- it can also be used in medicine in the production of drugs e.g penicillin, aspirin and morphine

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| HETEROCYCLIC | HOMOCYCLIC |
| Heterocyclic compounds are cyclic compounds having atoms of different elements as ring members including carbon atoms | Homoclyclic compounds are cyclic compounds having atoms of same element as ring members  |
| Ring contains atoms of different elements  | Ring contains atoms of the same element  |
| Contain atoms of at least different elements bonded to each other forming a ring | Contain atoms of the same element bonded to each other forming a ring |
| Examples are pyran, azocine, thiocane, etc | Examples are benzene, cyclohexane, toluene etc |

QUESTION 2:

1. Retardation factor = $\frac{distance moved by substance \left(cm\right)}{distance moved by solvent \left(cm\right)}$

Distance moved by solvent = 12.2cm

1. R.F = $\frac{2.4}{12.2}$ = 0.196
2. R.F = $\frac{5.6}{12.2} $= 0.459
3. R.F = $\frac{8.9}{12.2}$ = 0.729
4. Organic compound A is in the alkanal family

Organic compound a is in the alkene family

1. 2,4-Dinitrophenylhyrdrazine test is used for the identification of aldehyde and ketone

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| FUNCTIONAL GROUP | EXAMPLES |
| -OH | Butanol, 1,2,3-propan-tri-ol |
| -(SINGLE BOND) | Ethane, butane |
| -COH | Ethanal, butanal |
| -NH2 | Phenylamine, methylamine |
| -CL,-F | 2-chloropentane, 3,3-trichlorobutane |
| -COOH | Benzoic acid, ethanedioic acid |
| -R | Butyl, ethyl  |