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DEPARTMENT: MEDICAL LABORATORY SCIENCE

COLLEGE: MEDICINE AND HEALTH SCIENCES

COURSE: CHEMISTRY II

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

Answers:

Mass total -105

Mass total – Nitrogen= mass of carbon and hydrogen

105-14= 91

We have 7 carbon atoms

7 hydrogen atoms

1 nitrogen atoms

The possible molecular formular is C7H7N

Assuming oxgen is present

Mass total –mass of Nitrogen +mass of oxygen=mass of carbon and hydrogen

105-30=75

75/12 = 6 remainder 3

C6H3ON is the possible molecular formula

b)What are importance of organic compounds?

They importance of organic compounds are as follows:

1. In nucleic acids: Nucleic acids are essential biopolymers for all life forms. They are composed of many elements but mainly carbon and hydrogen, although there so but mainly carbon and hydrogen, although there are so oxygen atoms in their sugar. Nucleic acids are found in abundance in all living things, where the create and encode and then to store information in the nucleus of all living cells of all living organisms on earth.
2. Carbohydrates: carbohydrates is a biological molecule consisting of carbon, hydrogen and oxygen. Carbohydrates that is rich in complex carbohydrates starches such as cereals, pasta, bread e.t.c carbohydrates like polysaccharides serve energy and act as a structural components in plants and anthropods.
3. As the basis food: food material are created from carbon compounds via carbohydrates, proteins and fats. Organic molecules make up a large portion of the human diet and are found in all food consumed by an individual. It requires a large number of organic molecules needed to keep cells and tissues healthy.
4. Hydrocarbons: hydrocarbons are organic compounds that are made up entirely of different types such as methane, ethane, propane, pentane and octane. Hydrocarbons are primary source of energy for civilization. They are also used as a source of fuel. In nature, particular hydrocarbons smells are used by Brazilian bee to differentiate members of the family.
5. Differentiate between homocyclic and heterocyclic compounds.

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| Homocyclic compounds | Heterocyclic compounds |
| 1. Homocyclic compounds are cyclic compounds having atoms of same element as ring members. | Heterocyclic compounds are cyclic compounds having atoms of the different elements as ring members including carbon atoms. |
| 1. Ring contain atoms of the same element. | Ring contains atoms of different elements. |
| 1. Examples include benzene, cyclohexane, toluene, cyclohexanol e.t.c | Examples include pyran, azocine, thiocine e.t.c |

2) if the distance of solvent font is 12.2cm. 2.4cm, 5.6cm and 8.9cm are distances of different bands respectively. Calculate the retardation factor of the available bands.

Retardation factor (Rf)= Distance moved by bands

Distance moved by solvents

Rf = 2.4/12.2 = 0.197

Rf= 5.6/12.2 =0.459

Rf= 8.9/12.2 = 0.730

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

Answer: A is an aldehydes

B is alkene

c)2,4 dinitrophenylhydrazine test is employed for testing for ketones and aldehydes

1. List 2 functional groups of organic compounds giving two examples of each group.

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| Functional group | Examples |
| 1.Alkanols/Alcohol | Butanol  Cyclopentanol |
| 2. Ethers | i.2-methyloxy-2- methylpropane  ii.ethoxyethane |
| 3.Aldehyde/alkanals | i. ethanal( C2H4O)  ii. propanal(C3H6O) |
| 4.Esters | i.ethylpropanoate  ii.methylbutanoate |
| 5.Amide | i.formmide(CH3NO)  ii.ethanamide(C2H5NO) |
| 6.Acid halides | i.acetyl chloride  ii.ethanoyl chloride |
| 7. Haloalkane/alkylhalides | i.iodoethane  ii.2-chloropropane |