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 CHEMISTRY ASSIGNMENT

**QUESTION 1**

1. If the mass of the molecular ion is odd it contains at least one N

N=14amu, 105-14=91

Determine the max no of C’s

91÷12=7.5

Taking the whole number before the decimal without approximating, this implies that the formula will be in the form C₂NHm where m is the number of moles of hydrogen

Therefore, m= 105-((12×7)+(1×14))

 =105-98

 =7

IHD=$\frac{2n+2-m}{2}$ where n is the number of moles of carbon

 =$\frac{2\left(7.5\right)+2-7}{2}$

 =$\frac{10}{2}$

 = 5

**Therefore the first formula is C₇NH₇ and IHD=5**

Repeating the same procedure but now we introduce oxygen:

O=16, 105-(16+14)=75

Dividing by 12 in order to determine the max no of carbon atoms, we have:

75÷12= 6.25

Our new formula is in the form C₈NOHm.

m= 105-((12×6)+14+16)

 =105-102

 =3

IHD=$\frac{2n+2-m}{2}$

 =$\frac{2\left(6.25\right)+2-3}{2}$

 =$\frac{11.5}{2}$

 =5.75

**Therefore the second formula is C₆NOH₃ and IHD=5.75**

1. Importance of organic compounds

For production of drugs to cure diseases

For diagnosing diseases

Food: most food materials are solely made up of carbon compounds e.g carbohydrates (CHO)

For the production of cleansing agents

For the production of valuables such as diamonds, graphite and petroleum

1. Difference between homocyclic and heterocyclic compounds

|  |  |
| --- | --- |
| Homocyclic Compounds | Heterocyclic Compounds |
| Homocyclic compound rings contain only one type of atom | Heterocyclic compound rings contains at least two different atoms including carbon |
| They have 100% carbon atom in their ring | They have mainly carbon and in addition, heteroatoms such as nitrogen, oxygen and sulphur are found in their ring  |
| Alicyclic homocyclic and Aromatic homocyclic | Alicyclic heterocyclic and Aromatic heterocyclic |
| Phenol, Toluene and Naphthalene | Piperidine, Pyridine and Furan |

**QUESTION 2**

1. The distance of the solvent the available bands front is 12.2 cm. 2.4cm, 5.6 cm and 8.9cm are distances of the different bands respectively. Calculate the Retardation factor of the available band
2. $\frac{2.4cm}{12.2cm}$=0.197
3. $\frac{5.8 cm}{12.2cm}$=0.459
4. $\frac{8.9cm}{12.2cm}$=0.730
5. Two organic compounds were labelled 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 belongs.

Compounds A is an aldehyde and compound B is an alkene

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

Alkanes – ethane and butane

Alkenes – ethylene and butene

Alkynes – acetylene and ethyne

Haloalkane – chloroethane and fluromethane

Alcohol – methanol and butanol

Ketone – butanone and propanone

Ester – ethyl butyrate and methyl propanoate

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