NAME: CHUKWUDULUE ISAAC

MATRIC NO: 17/ENG04/016

DEPARTMENT: ELECTRICAL/ELECTRONICS ENGINEERING

QUESTION 1

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

A. Fragment at m/z =105

 N=14amu. 105-14=91

 91/12 = 7.5---------C7NH?

 7\*12 = 84

 1\*14 = 14

 105 - (84+14) = 7

 So therefore 7 hydrogen's gives C7NH7

Therefore... (2n +2 -no of hydrogen)/2

[2(7.5)+2-7]/12= 5.25

Then add an oxygen atom

C7NH7 -------C6NOH3

[(2(6.5)+2-3)/2]=5.5

1B.

 Organic compounds are important because they serve as the basic form of all carbon bases for life on earth.

* Create energy production in biological life
* Causes atmospheric depletion and releases hydrocarbon energy
* Organic compounds have versatile bonding patterns and are part of all organisms
* Long carbon chain can be produced
* Will bond with many other elements
* Can form single, double and triple bonds
* A huge number of carbons is produced
* Organic compounds form stable bonds to other carbon

atoms- (catenation).

C.

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| HOMOCYCLIC COMPOUNDS | HETERCYCLIC COMPOUNDS |
| Their rings are formed with at least two types of atoms. | Their rings are formed with at least two types of atoms. |
| Ring contains atom of the same element  | Ring contains atoms of different elements  |
| Contains atoms of the same element bonded to each other containing a ring  | Contains atoms of at least two different element bonded to each other forming a ring  |
| Examples include: benzene, cyclohexane,toluene, cyclohexanol | Examples include: pyran, azocibe, thiocane etc.  |
| They have 100%carbon atoms in the ring. | They have mainly carbon and in addition, heteroatoms such as nitrogen, oxygen and sulphur are found in their ring. |

QUESTION 2

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

Answer

Let the distance of the bands be A ,B and C

Hence:

Distance moved by the band A=2.4cm

Distance moved by the band B=5.6cm

Distance moved by the band C=8.9cm

Distance of the solvent front=12.2m

 RF for A= Distance moved by the band A =2.4cm =0.1967=0.2

 Distance moved by the solvent front 12.2cm

 RF for B = Distance moved by the band **B** = 5.6cm = 5.6cm =0.7295=0.7

 Distance moved by the solvent front 12.2cm 12.2cm

 RF for C= Distance moved by the band C =8.9 =0.73cm

 Distance moved by the solvent front 12.2

B.)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 belong.

 Answers

 The organic compound of A is an Aldehyde compound and the organic compound of B is an Alkene compound.

C.) test 2,4-dinitrophenylhydrazine test can be used to qualitativel detect the carbony functionality of Aldehydes and Ketones.

D.) List 7 functional groups giving two examples of organic componds giving two examples each.

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| **ORGANIC COMPOUNDS** | **FUNCTIONAL GROUPS** | **EXAMPLES** |
| Alkyl halide  | -F -Cl -Br  | CH3Cl C2H5CL |
| Alcohol | -OH | CH3OH C2H5OH |
| Ether | R-O-R | CH3OC2H5 C2H5OC2H5 |
| Alkanal | -COH | CH3CHO C2H5CHO |
| Ketone | R-CO-R | CH3(C=O)CH3 C2H5(C=O)C2H5 |
| Carboxylic acid | -COOH | HCOOH CH3COOH |
| amines | -NH2 | CH3NH2 C2H5NH2 |