**Chemistry Assignment**

**Name:** Oyedeji Temitope Deborah

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**Department:** Medicine and Surgery

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

b.) What are the importance of organic compounds

c.) Differentiate between homocyclic and heterocyclic compounds

2a.) 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

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

c.) 2,4-Dinitrophenylhydrazine test is employed for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d.) List 7 functional groups of organic compounds giving two examples of each group.

**Solution**

**1a.)**

Phenylmethanone (C7H5O)

Ethylbenzene(C8H9)

Pyran-3-Carbonitrile (C6H3NO)

Phenylmethanimine (C7H7N)

**b.)** Importance of organic compounds

i.) They are important because all living things contain carbon.

ii.) They are the basis of food like milk, butter, bread(yeast), sugar etc.

iii.) Phenol, formaldehyde are disinfectant used to kill microbes

iv.) They are also important in the metabolism of the body.

v.) Petroleum, an organic compound is an important source of fuel and national revenue.

vi.) Ethylene oxide is used for sterilisation of drugs and manufactured substances.

vii.) Folic acid is important for pregnancy. Fat minimises heart diseases.

viii) They also make up proteins which is important in the human body building.

ix.) They also form lipids which aids in storing energy in the human body and acts as a structural component of cell membranes.

x.) They also form carbohydrates which play an important role in organisms

xi.) Alcohol is used in baking, in industries , for making methylated spirit , and as beverages.

xii.) Diamond and Graphites are allotropes of carbon. Diamond is used in making jewelries, it's very expensive and it's the hardest known substance that can be used to cut metals. Graphite is used in construction of roads and making the leads in pencils

1c.)

**DIFFERENCES BETWEEN HOMOCYCLIC AND HETEROCYCLIC**

|  |  |
| --- | --- |
| **HOMOCYCLIC COMPOUNDS** | **HETEROCYCLIC COMPOUNDS** |
| Homocyclic compounds are compounds that consist only of carbon atoms within the ring | Heterocyclic compounds are compounds that contain at least one non-carbon atom in the ring |
| Examples are Phenol, Toluene, Naphthalene | Examples are Piperidine, Pyridine, Furan |
| They are divided into alicyclic homocyclic and aromatic homocyclic | They are divided into Alicyclic heterocyclic and Aromatic Heterocyclic |
| Homocyclic compounds contain atoms of the same element bonded to each other forming a ring | Heterocyclic compounds contain atoms of at least two different elements bonded to each other forming a ring. |
| .  Homocyclic compound contains only one type of atom | Heterocyclic compound ring contains at least two different types of atoms including carbon |

**2a.)** Distance of solvent front = 12.2cm

Distance of band A = 2.4 cm

Distance of band B = 5.6 cm

Distance of band C = 8.9 cm

Retardation factor (Rf) of A =

=

= 0.1967

Retardation factor (Rf) of B =

=

= 0.4590

Retardation factor (Rf) of C =

=

= 0.7295

**b.)** Organic Compound A belongs to Family of Aldehydes

Organic compound B belongs to Family of Alkenes

**c.)** Aldehyde and Ketones

**d.)** **Functional groups of Organic Compounds**

i.) Carboxylic acids (-COOH)

Examples

Butanoic acid

Propanoic acid

ii.) Alkanoate (-COOR)

Examples

Sodium ethanoate

Sodium propanoate

iii.) Alkanols (-OH)

Examples

3–methyl pentan-2-ol

1,2,3-propentriol

iv.) Haloalkane (-Cl, - Br)

Examples

1- Bromo Butane

Chloro Ethane

v.) Aldehydes (-CHO)

Examples

Propanal

Ethanal

vi.) Alkene (C = C)

Examples

Pentene

Butene

vii.) Ethers (-OR)

Examples

Ethoxyethane

Methoxyethane