**Chemistry Assignment**

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**College:** Medicine and Health Sciences

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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.)** Ethylbenzene(C8H9), Phenylmethanimine (C7H7N), Phenylmethanone (C7H5O), Pyran-3-Carbonitrile (C6H3NO)

**b.)** Importance of organic compounds

* DRUGS TO CURE DISEASE: In medicine many drugs used for treatment of diseases are made of organic compounds.
* CLEANSING AGENTS: In industries and labs, organic solvents are widely used to clear off impurities.
* STERILIZING AGENTS: Most of the sterilizing agents and disinfectants like phenol and formaldehyde are carbon compounds.
* VALUABLES: Diamonds, graphite and petroleum are composed of organic compounds. Interestingly the carbon compounds are found to be highly, valuable and hardest in the world.
* FOR ANALYSIS: Not all organic substances are soluble in water. So they can be analysed by non-aqueous titration. For this they use organic solvents like pyridine, methanol, acetone etc.
* They are important because all living things contain carbon.
* They are the basis of food.
* They are also important in the metabolism of the body.
* They are important in hydrocarbons and hydrocarbons is the primary source of energy for most civilizations today
* They also make up proteins which is important in the human body.
* They also form lipids which aids in storing energy in the human body and acts as a structural component of cell membranes.
* They also form carbohydrates which play an important role in organisms

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| **DIFFERENCES BETWEEN HOMOCYCLIC AND HETEROCYCLIC** |
| S/N | **HOMOCYCLIC COMPOUNDS** | **HETEROCYCLIC COMPOUNDS** |
| 1. | 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 |
| 2. | Examples are Phenol, Toluene, Naphthalene | Examples are Piperidine, Pyridine, Furan |
| 3. | Homocyclic compound contains only one type of atom | Heterocyclic compound ring contains at least two different types of atoms including carbon |
| 4. | They are divided into alicyclic homocyclic and aromatic homocyclic | They are divided into Alicyclic heterocyclic and Aromatic Heterocyclic |
|  | • Homocyclic compounds are cyclic compounds having atoms of the same element as ring members .  | • Heterocyclic compounds are cyclic compounds having atoms of the different elements as ring members including carbon atoms. |

 **c.)**

**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 = $\frac{Distance moved by band A}{Distance moved by solvent front}$

 = $\frac{2.4cm}{12.2cm}$

 = 0.1967

Retardation factor (Rf) of B = $\frac{Distance moved by band B}{Distance moved by solvent front}$

 = $\frac{5.6cm}{12.2cm}$

 = 0.4590

Retardation factor (Rf) of C = $\frac{Distance moved by band C}{Distance moved by solvent front}$

 = $\frac{8.9 cm}{12.2cm}$

 = 0.7295

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

Organic compound B belongs to Family of Alkenes

**c.)** It is a red to orange solid that is a substituted hydrazine and is often used to qualitatively test for carbonyl groups associated with aldehydes and ketones. The hydrazine derivatives can also be used as evidence toward the identity of the original compound.

**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