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MATRIC NO: 17/ENG07/019

 DEPARTMENT: PETROLEUM ENGINNERING

CHE 102 ASSIGNMENT

QUESTION 1

1. Fragment at m/z =105

Step1- if the mass of the molecular ion is odd it contains at least one nitrogen N= 14 atoms 105-14=91

Step2- determine max NC’S

 91/12 = 7.5 C7NH?

Sep3- add enough H’s to make up the rest of the madd

 7×12=84

 1×14=14

 105-(84+14)=7

 7H’S gives C7NH7

 (2n+2-7)/2= 2(7.5)+2-7/2 =5.25

Step4- add an O atom

 C7NH9→C6N0H3

 (2(6.5) + 2−3)­­­­­­­­­­­­­­­­­­­­­­­­­­­­/2=5.5 ~6.

 B. IMPORTANCE OF ORGANIC COMPOUNDS

Organic compounds play an important role in our daily activities. There is hardly any walk of life where we do not need the organic compounds. The food that we eat is essentially a mixture of organic compounds. The changes which the food undergoes in our bodies are organic chemical reactions. The clothes that we wear whether of cotton or synthetic fiber all are organic in character. The soap, cosmetics, perfume, oils, plastics, explosives, rubber, dyestuffs, paper, insecticides, etc., are all organic compounds. In the medicinal field, organic compounds are indispensable. Antibiotics, sulpha drugs, alkaloids, aspirin, iodoform, etc., are organic compounds. There is hardly any industry which is not dependent on organic compounds. The following list clearly illustrates the importance of organic compounds.

**1. Food**: Carbohydrate, Proteins, Fats, vitamins, Enzymes, etc.

**2. Clothes**: - Cotton, Silk, Wool, Nylon, Rayon, Dacron, etc.

**3. Fuels**: - coal, Wood, Natural gas, Petrol, etc.

**4. Medicines**: - Penicillin, Streptomycin, Chloromycetin, Sulphadiazine, Morphine, Aspirin, Iodoform, Cocaine, etc.

**5. Explosives**: - Nitroglycerine, Nitrocellulose, T.N.B, T. N.T, etc.

**6. Dyes**: - Indigo, Malachite green, Alizarin, etc.

**7. Insecticides**: - D.D.T, Gammexane, Malathion, etc.

**8. Household and other common articles**:- soaps, Cosmetics, Perfumes, Detergents, paper, Rubber, Plastics, Leather,  Resins, Inks, Paints, Varnishes, Photographic films, etc.

C. QUESTION 2

|  |  |
| --- | --- |
| Homocyclic | Heterocyclic |
| They are cyclic compounds having atoms of the same element as ring members | They are cyclic compounds having atoms of different elements as ring members including carbon 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.  |

R.f of the band: $\frac{distance travelled by the band}{distance travelled by the solvent}$

A. R.f of the first band: $\frac{2.4}{12.2}=0.2$

 R.f of the second band: $\frac{5.6}{12.2}=0.45$

 R.f of the third band: $\frac{8.9}{12.2}=0.729$

B. A- belongs to the family of the aldehyde, aromatic aldehyde and alpha hydroxyl ketone functional group and B- belongs to the alkene or alkyne family

C. 2,4-Dinitrophenylhydrazine can be used to qualitatively detect the carbonyl functionality of a ketone or aldehyde functional group.

D. Alkanes –pentane (C5H12) and cyclobutane (C4H10)

Alkenes – ethene (C2H4) and hexene (C6H12)

Alkynes – ethyne (C3H4) and heptyne (C7H12)

Ketones- 2-butanone (C4H8O) and 3-pentanone (C5H10O)

Aldehydes- ethanal (C2H4O) and butanal (C4H8O)

Carboxylic acid- benzoic acid (C6H5COOH) and prop ionic acid (CH3CH2COOH),

Esters- methyl ethanoate (C3H6O2) and methyl propanoate (C4H8O2)