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COURSE: CHM102

QUESTION 1

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

TO GET MAX NUMBER OF CARBON ATOM

105 = 9

 12

1. C7H5O
2. C6HO2
3. C5H13O2
4. C4H9O3
5. C3H5O4
6. C2HO5
7. CH13O5
8. What are the importance of organic compounds?

The importance of organic compounds are as follows:

1. It is found in carbohydrates, Fats, Proteins which are the basic macromolecules of life.
2. It is production of fuels.
3. It is used in production of clothing materials e.g. Cotton, Silk, Wool, Nylon, Rayon, etc
4. It is used in Pharmaceutical companies in the production of medicines e.g. Penicillin, Morphine, Aspirin.
5. It is used in production of insecticides.
6. It is also used in the production of dyes.
7. It can be used in the production of household and other common articles such as soaps, Cosmetics, Perfumes, Detergents, Paper, Rubber, Plastics, Leather, Resins, Inks, Paints, Varnishes, Photographic films, etc
8. It is used in the production of explosives.
9. Differentiate between homocyclic and heterocyclic compounds.

Homocyclic compounds; the ring is made up of carbon atoms only while that of heterocyclic compounds is made up of more than one of kind of atoms.

QUESTION 2:

1. 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.

RETARDATION FACTOR= $\frac{DISTANCE TRAVELLED BY BANDS}{DISTANCE TRAVELLED BY SOLVENT FRONTS}$

RF1: $\frac{2.4cm}{12.2cm}$ = 0.20

RF2:$ \frac{5.6cm}{12.2cm}$ = 0.46

RF3: $\frac{8.9cm}{12.2cm}$ = 0.73

1. Two organic compounds were labelled A and B. A gave a positive test result (dark grey precipitate) to Tollens test and B decolorizes Bromine water. Suggest the family to which these organic compounds belong.

A belongs to ALDEHYDE FAMILY.

B belongs to ALKENE GROUP.

1. 2,4-Dinitrophenylhydrazine test is employed for ALDEHYDES AND KETONES.
2. List 7 functional groups of organic compounds giving two examples of each group.

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| FUNCTIONAL GROUP | GENERAL FORMULA | CLASSES OF ORGANIC COMPOUNDS | EXAMPLES |
| -F, -CL, -BR, -I, -As |  R-X | ALKYL HALIDES | CH2Cl(CH2)2CH3= 1-Chlorobutane.CH3CHBr(CH2)2CH3= 2-bromopentane. |
| -OH | R-OH | ALKANOLS/ALCOHOLS | C2H5OH= Ethanol.C3H7OH= Propanol. |
| -COOH | R-COOH | CARBOXYLIC ACID | CH3COOH= Ethanoic acid.C2H5COOH= Propanoic acid. |
| -NH2 | R-NH2 | AMINES | CH3CH2CH2NH2= Propylamine.CH3CH2NH2 = Ethylamine. |
| -COH |  R-C-H$$∥$$ O | ALDEHYDES/ALKANALS | CH3CH2COH= PropanalCH3CH2CH2COH= Butanal. |
| -C=O |  R-C-R’ $∥$ O | ALKANONES/ KETONES | CH3COCH3= Propanone.CH3CH2COCH3 = Butanone |
| -C=O $∥$OR | RCOOR’ | ESTERS | CH3CH2COOCH3= Methyl propanoate.CH3CH2COOCH2CH3=Ethyl ethanoate. |

Where R= alkyl group.

 R’= another alkyl group different from R.