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***QUESTION 1***

1. Since the mass total is 105 which is an odd number. Therefore, at least 1 nitrogen atom is present.

So subtracting 14 from 105 leaves 91 as the mass from carbon and hydrogen.

91/12= 7 remainder 7

7 carbon atoms

7 it from atoms

1 nitrogen atom

Therefore, C₇H₇N is the possible molecular formula

Assuming oxygen is present with the nitrogen we now have to add the masses of the nitrogen and the oxygen and subtract from 105. That leaves us with 75. Divide by 12

75/12 And we have 6 remainder 3

Therefore another possible formula will be C6H3ON

Assuming 2 Nitrogen atoms are present we now have to subtract 28 from 105 leaving us with 77. Divide by 12 and we have 6 remainder 5

So therefore another formula can be C6H5N2

B. Organic compounds play an important role in our daily activities.

1. They are constant in our Food: Carbohydrate, Proteins, Fats, vitamins, Enzymes, etc.

2. Present in our Clothes: - Cotton, Silk, Wool, Nylon, Rayon, Dacron, etc.

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

4. Used in 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. Homocyclic compounds are also known as carbocyclic compounds or isocyclic compounds as their rings are formed with only one type of atoms, mainly carbon. Homocyclic compounds can be further classified into alicyclic compounds and arenas or aromatic compounds while Heterocyclic compounds are the cyclic compounds in which the rings contain at least two different types of atoms (including a carbon atom). The atoms other than the carbon atoms present in the ring are known as heteroatoms.

An example of homocyclic is Cyclopropenylidene and an example of heterocyclic is Thiamine.

***QUESTION 2***

1. Solvent front = 12.2cm

Band A = 2.4 cm

Band B = 5.6 cm

Band C = 8.9 cm

R*F* = (band x) cm/ (solvent front) cm

R*F* of band A= 2.4cm/12.2cm = 0.196

R*F* of band B= 5.6cm/12.2cm = 0.45

R*F* ofband C=8.9cm/12.2cm =0.72

1. Since substance A gave a positive result by producing a dark grey precipitate to Tollens test, it is an aldehyde. Substance B decolourized bromine therefore it is an unsaturated compound. Either an alkene or alkyne.
2. It is employed for aldehydes and ketones.

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| Functional groups  | Examples |
| Alkane | Methane and ethane |
| Alkene | But-1-ene and pent-1-ene |
| Alkyne | Propyne and butyne |
| Alkanol | 1-pentanol and 1-butanol  |
| Alkanone |  Butanone and pentanone |
| Aldehyde | Propanal and ethanol |
| Carboxylic acid | Propanoic acid and butanoic acid |

1.