

NAME: OWOPE MAYOWA MICHELLE

DEPARTMENT: MEDICINE AND SURGERY

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### ASSIGNMENT

1A. possible formula for a molecular ion (m/z) of 105

#### Solution

If the mass of the molecular ion is odd, it contains at least one nitrogen atom N.

$$N = 14 \text{amu}$$

$$105 - 14 = 91$$

Determine the maximum number of carbon atoms

$$91 / 12 = 7.5 \text{ hence 7 carbon atom maximum. } C_7H_{17}N$$

$$(12 \times 7) + (1 \times 17) + 14 = 105$$

$$84 + 17 + 14 = 105$$

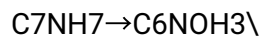
$$98 + H = 105$$

$$H = 105 - 98$$

$$H = 7$$

$C_7H_7N$  is a possible formula

Add an oxygen atom into the formula (-CH<sub>2</sub> when adding O)



The possible formulas are  $C_7H_7N$ ,  $C_6H_5NO_2$

1B. Importance of organic compounds

- Organic compound is important because it involves the study of life and all chemical

reactions related to life.

- b. Organic chemistry uses some diagnosing aids to detect organic part of the deficiency or disturbed substance
- c. Organic compounds are used in making sterilizing agents and disinfectants such as formaldehyde, phenol etc. due to their properties like solubility, PH they can kill microbes'
- d. Allotropes of carbon such as diamond can be used to make durable and valuable jewelries.
- e. Organic compound are in the medical sector to manufacture painkillers, drugs, antibiotics,

1C. Differences between Homocyclic and Heterocyclic compounds anesthetics anti-depressant.

	Homocyclic compounds	Heterocyclic compounds
1.	Cyclic compounds with same element as ring members.	Cyclic compounds with different elements as ring members.
2.	Homocyclic compounds have 100% carbon atoms in their rings.	Heterocyclic compounds have mainly carbons with heteroatoms such as nitrogen, oxygen, sulphur is found in their rings.
3	It contains atoms of the same element bonded to each other to form ring.	It contain atoms of different elements bonded together to form ring.
4 . \	Examples includes; phenol, toluene, naphthalene and anthracene.	Examples include; furan, pyridine, tetrahydrofuran, piperidine, pyrrole.

$$2. R_f = \frac{\text{distance moved by substance}}{\text{distance moved by solvent front}}$$

Distance moved by solvent font= 12.2cm

Distance moved by substance1= 2.4cm

$$R_f \text{ for band A} = \frac{2.4\text{cm}}{12.2\text{cm}} = 0.197$$

Distance moved by band B = 5.6cm

$$R_f \text{ for band B} = \frac{5.6\text{cm}}{12.2\text{cm}} = 0.459$$

$$R_f \text{ moved by band C} = \frac{8.9\text{cm}}{12.2\text{cm}} = 0.730$$

2b. since A was positive to Tollens test then A is an Aldehyde and since B decolourise bromine water it is an alkene.

2C. 2,4-dinitrophenylhydrazine test is employed for Ketones and Aldehydes.

2D Functional groups and their examples

1.	Alkane	Methane, propane
2.	Alcohol	Ethanol, Propanol
3.	Alkanal	Propanal, butanal
4.	Alkyne	Propyne, pentayne
5.	Amine	Propyl_amine, dimethyl_amine
6.	Alkene	Butane, propene
7.	<u>Ether</u>	Methyl ethyl ether, diethyl ether