

Edidiong Joseph Eyo  
Nursing

17/M/FS02/040

CHM 102 Assignment

### QUESTION 1.

A) Formula mass = MS

$$\text{Given: C} = 12.0107 \text{ g/mol}$$

$$\text{H} = 1.00794 \text{ g/mol}$$

$$\text{O} = 15.999 \text{ g/mol}$$

$$\text{N} = 14.0067 \text{ g/mol}$$

$$\begin{aligned} \text{a) } \text{C}_2\text{H}_3\text{NO}_4 \text{ (Acetyl nitrate)} &= (2 \times 12.0107) + (3 \times 1.00794) + (14.0067) + (4 \times 15.999) \\ &= 105.05 \text{ g/mol} \end{aligned}$$

$$\begin{aligned} \text{b) } \text{C}_5\text{H}_3\text{N}_3 &= (5 \times 12.0107) + (3 \times 1.00794) + (3 \times 14.0067) - \text{Pyrazine carbonitride} \\ &= 105.1 \text{ g/mol} \end{aligned}$$

$$\begin{aligned} \text{c) } \text{C}_3\text{H}_7\text{NO}_3 &= (3 \times 12.0107) + (7 \times 1.00794) + (14.0067) + (3 \times 15.999) \\ &\quad - \text{2-Nitro-1 propanol} \\ &= 105.093 \text{ g/mol} \end{aligned}$$

$$\begin{aligned} \text{d) } \text{C}_7\text{H}_5\text{O} &= (7 \times 12.0107) + (5 \times 1.00794) + (15.999) - \text{Phenyl methanone} \\ &= 105.116 \text{ g/mol} \end{aligned}$$

### B) IMPORTANCE OF ORGANIC CHEMISTRY.

- 1) They are used as sterilizing agents.
- 2) They are used as analytical substances.
- 3) Certain valuables are made up them eg diamonds.
- 4) They solely make up food substances.
- 5) They are used in medicine for the production of drugs for curing diseases.

### C DIFFERENCES BETWEEN HOMOCYCLIC AND HETEROCYCLIC COMPOUNDS -

Homocyclic	Heterocyclic:
a) They are cyclic compounds having atoms of the same element as ring members.	They are compounds having atoms of at least two different elements including carbon atoms as ring members.
b) Ring contains same atoms of elements.	Ring contains atoms of different elements including oxygen, sulphur, nitrogen and carbon.
c) Examples are Benzene, toluene, phenol, cyclohexane, naphthalene etc.	Examples are azetidine, pyridine, pyran etc.

### Question 2:

(A) Retardation factor =  $\frac{\text{Distance moved by substance}}{\text{Distance moved by solvent front}}$

Given: Solvent front = 12.2 cm

Band A = 2.4 cm

Band B = 5.6 cm

Band C = 8.9 cm

B) Tollen's test gives a positive test for Aldehydes, Thus A is an Aldehyde

Bromination test / Bromine water test gives a positive test for unsaturated compounds. Thus B, is an unsaturated compound (Alkene or alkyne) -

C) 2,4-Dinitrophenylhydrazine is employed for, or to qualitatively detect the carbonyl functionality of a ketone or aldehyde functional group -

D: 7 Functional groups:

- i Alkanol / ROH - Ethanol ( $C_2H_5OH$ )
- ii Ether / RO-R' - Ethoxyethane ( $C_2H_5OC_2H_5$ )
- iii Alkyl halide / RX - Ethyl fluoride ( $C_2H_5F$ )
- iv Alkanal / Aldehydes / RCHO - Pentanal ( $C_5H_{10}O$ )
- v Alkanoate / Ester / ROOR' - Ethyl propanoate ( $CH_3CH_2COOC_2H_5$ )
- vi Alkanones / ketones / RCOR - 2-Hexanone ( $C_6H_{12}O$ )
- vii Alkanoic / carboxylic acids / RCOOH - propanoic acid ( $C_3H_7COOH$ )