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COLLEGE: MEDICINE AND HEALTH SCIENCES

DEPARTMENT: MEDICAL LAORATORY SCIENCE.

COURSE CODE: CHM 1O4

 ANSWERS.

1. The rule of 13 states that the formula of a compound is a multiple n of 13 (the molar mass of CH) + the remainder r

According to the rule of 13 ; n= $\frac{molecular ion}{13}$

CnHn+r

If you have heteroatoms , you adjust the formula;

For O, add O and subtract CH4

For N, add N and subtract CH2

For cl, add Cl and subtract C2H11

Molecular ion = 105

According to the rule of 13= $\frac{105}{13}$

n=8, r=1

using CnHn+r=

I.C8H9

II.C7H5O

III.C7H7N

IV.C6H9N2

V. C3H3N3

VI. C4HNH4

VII. C6H3NO

1.B. i. alkanes are used extensively as fuels for things like automobile gasoline and home/heating and cooking fuels.

ii. Alcohols are used as antiseptic.

iii. ethanol is used extensively in the beverage industry.

iv. carboxylic acid includes a wide variety of chemicals used in pharmacies e.g. Aspirin.

v. ethylene is used in making polythene covers.

vi. acetylene is used as a gas for welding.

vii.methane is used to produce electricity

viii. cyclohexane is used as a solvent.

ix. di-ethyl is used as an anesthetic.

x. acetone is used as a solvent in chromatography and it is also used to remove nail polish.

xi. formaldehyde is used as a disinfectant to preserve biologic samples.

xii. aromatic compounds are used as solvents, medicine, catalysts etc

C.

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| Homocyclic. | Heterocyclic. |
| 1. Contains only one type of atoms.
 | Contains at least two different kinds of atoms. |
| 1. Have 100% carbons in their rings.
 | They have carbons and heteroatoms eg nitrogen, oxygen etc |
| 1. They are ring compounds with alternating single and double bonds
 | They are ring compounds composed of different elements.ss |
|  |  |

2. $ retardation factor \left(RF\right)=\frac{distance moved by substance}{distance moved by solvent front}$

 RF$=\frac{x cm}{ycm}$

Solvent front= 12.2cm

1. For 2.4cm

Rf = $\frac{2.4cm}{12.2cm}$ = 0.196

1. For 5.6 cm

Rf = $\frac{5.6cm }{12.2c,}$ =0.459

1. $rf=\frac{8.9cm}{12.2cm}$ = 0.729

B. A is an aldehyde or ketone

 B is an alkene

C. it is employed for testing of carbonyl groups associated with aldehydes and ketones

D.

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| Functional group. | Examples. |
| 1. –OH
 |  Ethanol (C2H5-OH)Propanol( C3H7-OH) |
| 1. Halides( -F,-Cl,-Br)
 | Bromoethane ( C2H5Br)Iodomethane (CH3I) |
| 1. –COOH
 | Ethanoic acid ( C2H5COOH)Petanoic acid (C5H11COOH) |
| 1. -
 | Methane (CH4)Ethane(C2H6) |
| 1. =
 | Ethene(C2H4)Butene(c4h8) |
| 1. –NH2
 | Methylamine (CH3NH2)Ethylamine(c2h5NH2) |
| 1. –O-
 | Dimethyl ether (CH3OCH3)Diethyl ether (C2H5OC2H5) |