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Course: chemistry 102

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

if heteroatoms are present we just adjust the formula.

* For O, add O and subtract CH4
* For N, add N and subtract CH2
* For Cl, add Cl and subtract C2H

Molecular ion= 105

According to the rule of 13,

105/13 =8R1

n =8 , r=1

using CnHn +r =C8H7

-C7H5O

-C6HO2

-C7H7N

-C6H9N2

-C5H3N3

-C4HN4

-C6H3NO

b) – organic compounds make up a large portion of the human diet and they are found in all food consumed by an individual. The body requires a large amount of organic compounds in the body to keep cells and tissues healthy.

- hydrocarbons are the primary source of energy in many countries today and they are mainly used as fuel. Hydrocarbons are organic compounds.

- organic compounds are used to produce explosives .

-organic compounds are used to produce household and common materials such as detergents, cosmetics, perfumes, and plastics.

-the clothes industry uses organic compounds to produce silk, cotton, wool and nylon.

-carbohydrates are organic compounds that consists of carbon, oxygen and hydrogen and they play an important role in living organisms.

c)

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| Properties | Homocyclic  Their rings contain only one type of atom. | Heterocyclic  Their ring contains at least two different types of atoms including carbon. |
| Atomic composition of the ring | They have 100% carbon atoms in their rings. | They have mainly carbon atoms in additions with heteroatoms such as nitrogen, oxygen, and sulphate are found in their rings. |
| Sub-divisions | Alicyclic homocyclic and aromatic homocyclic | Alicyclic heterocyclic and aromatic heterocyclic. |
| Examples | Phenol, toluene, naphthalene and arothracene | Tetrahydrofuran, piperidine, pyridine furan and pyrrole. |

1. a) Retardation factor= distance moved by substrate/ dis. moved by the solvent front.

Rf1= 2.4/12.2 =0.197

Rf2= 5.6/12.2 =0.459

Rf3= 8.9/12.2 =0.730

b) A belongs to Ketone family

B belongs to Alkene family

c) Ketone and Aldehyde

d) Alkane – CH3CH3

Alkene – CH2=CH2

Ketone – H3CCOCH3

Aldehyde – H3CCOHH3C-C=O-H

Carboxylic acid –H3CCOOH

Ester- H3COOCH3

Amine – H3CH2CNH2