WORKSHEET 2

CHAPTER 12 – ORGANIC CHEMISTRY-I

A. Tick (√) the correct option.

1. C_4H_9 is an

   a. alkane b. alkene c. alkyne d. alkyl group.

2. A hydrocarbon of the general C_nH_{2n} is

   a. C_5H_{10} b. $C_{12}H_{26}$ c. C_8H_{20} d. C_6H_{14}

3. A hydrocarbon with molecular mass 72 is

   a. an alkane b. an alkene c. an alkyne d. None of these

4. The total number of different carbon chains that four carbon atoms form in alkane is

   a. 5 b. 4 c. 3 d. 2

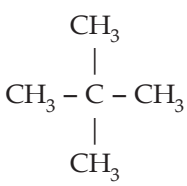
5. $CH_3 - CH_2 - OH$ and $CH_3 - O - CH_3$ are

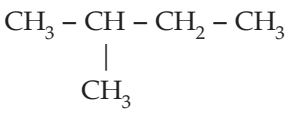
   a. position isomers b. chain isomers c. homologous d. functional – group isomers

B. Fill in the blanks from the choices given within the brackets.

1. Propane and ethane are _____ (homologous/heterologous)
2. A saturated hydrocarbon does not participate in a/an _____ (addition/substitution) reaction.
3. Succeeding members of a homologous series differ by _____ ($-CH_2$/$-CH_2CH_3$)
4. As the molecular masses of hydrocarbons increase, their boiling points _____ (increase/decrease) and melting point _____ (increase/decrease)
5. CO is an _____ (organic/inorganic) compound.

C. Write the IUPAC name of the following.

1. 

2. 

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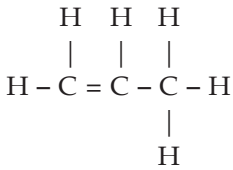
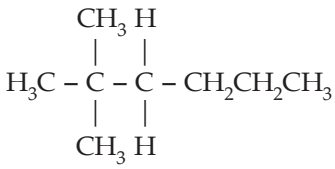
3. 

4. 

5. $CH_3 - C = C - CH_2CH_3$

D. Write the structure of the following compounds.

1. Prop-1-ene
2. 2, 3 – dimethyl butane
3. 2 – methyl propane
4. 3-hexene
5. prop–1–yne

E. Answer the following questions.

1. What do you understand by the following terms:
   a. Organic chemistry
   b. Organic compounds
2. Why are there very large number of organic compounds?
3. Name some important natural sources of organic compounds.
4. What is the importance of organic compounds?
5. How do paraffins differ from unsaturated hydrocarbons?

ANSWERS

WORKSHEET 2

A. Tick (√) the correct option.

1. d 2. a 3. b 4. b 5. d

B. Fill in the blanks from the choices given within the brackets.

1. homologues
2. addition reaction
3. $–CH_2$
4. increase, increase
5. inorganic

C. Write the IUPAC name of the following.

1. 2,2- dimethylpropane
2. 2-methyl butane
3. Prop-1-ene
4. 2,2- dimethyl hexane
5. Pent-2-yne

D. Write the structure of the following compounds.

1. $CH_3 – CH = CH_2$
2. $CH_3 – CH(CH_3) – CH(CH_3) – CH_3$
3. $CH_3 – CH(CH_3) – CH_3$
4. $CH_3 – CH_2 – CH = CH – CH_2 – CH_3$
5. $CH_3 – C \equiv CH$

E. Answer the following questions.

1. a. **Organic chemistry:** The branch of chemistry dealing with carbon compounds, other than carbon monoxide, carbon dioxide and carbonates, is called organic chemistry.

   b. **Organic compounds:** The chemical compounds containing carbon as an element (except carbonates; carbon monoxide and carbon dioxide) along with hydrogen, oxygen, nitrogen, sulphur, phosphorus as auxiliary atoms are called organic compounds.

2. Carbon is a unique atom which has four electrons in its outermost shell. The four valencies of carbon can be satisfied by (i) a single covalent bond between two carbon atoms (ii) a double covalent bond between two carbon atoms (iii) a triple covalent bond between two carbon atoms. Furthermore, carbon atoms can form straight chains, branched chains and closed chains. Thus, millions of combinations are possible with carbon and other elements. Hence, there are a very large number of organic compounds.

3. Following are the natural sources of organic compounds.
   i. Plants
   ii. Animals
   iii. Coal
   iv. Petroleum
4. Importance of organic compounds
   i. They are the source of food (such as carbohydrates, proteins, fats, vitamins).
   ii. They provide material for clothing, such as cotton, silk and wool.
   iii. They are the source of energy and fuels such as petroleum products and coal.
   iv. They are basic materials for dyes, drugs and explosives.
5. In case of paraffins, all the valencies of the carbon atoms in a molecule of a compound are satisfied by a single covalent bond.

   In case of unsaturated hydrocarbons, there is a double covalent bond (–C = C–) or a triple covalent bond (–C ≡ C–), between at least two carbon atoms in the molecule of a compound.