



CHEMISTRY

BOOKS - TARGET PUBLICATION

CARBON COMPOUNDS

Choose The Correct Alternative 1 Mark Each

1. The number of covalent bonds that one carbon atom can form is _____ .

A. 2

B. 4

C. 3

D. 5

Answer: B



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2. The saturated hydrocarbon from the following carbon compounds is _____ .

A. ethene

B. ethyne

C. ethane

D. benzene

Answer: C



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3. Tincture of iodine contains

- A. ethanol
- B. methanol
- C. ethanal
- D. acetic acid

Answer: A



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4. The function group in butanone is _____ .

- A. ether

B. ester

C. ketone

D. aldehyde

Answer: C



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5. Which of the following contains – OH functional group ?

A. Butanone

B. Butanol

C. Butanoic acid

D. Butanal

Answer: B



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6. Which of the following compounds will burn with a sooty flame?

A. Benzene

B. Propanol

C. Ethanoic acid

D. Butane

Answer: A



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7. Combustion of coal in air is a _____ reaction.

- A. combination
- B. displacement
- C. decomposition
- D. double displacement

Answer: A



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8. In laboratory, a student added 3 mL ethanol and 5 mL sodium carbonate in a test tube and warmed the mixture for few minutes. He then slowly added few drops of potassium permanganate to this warm solution with constant stirring.

He observed that the pink colour of potassium permanganate had disappeared. This is because _____

.

- A. ethanol is reduced to ethane
- B. ethanol is oxidized to ethane
- C. ethanol is oxidized to ethanoic acid
- D. ethanol is oxidized to ethanoic acid

Answer: D



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9. When ethanol reacts with sodium, the products are _____.

- A. sodium ethanoate and hydrogen
- B. sodium ethanoate and oxygen
- C. sodium ethoxide and hydrogen
- D. sodium ethoxide and oxygen

Answer: C



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10. In an experiment to study the properties of ethanoic acid, a student dipped red and blue litmus papers to the solution of ethanoic acid. What would he observe?

- A. Red litmus remains red and blue litmus turns red.
- B. Red litmus turns blue and blue litmus remains blue.

C. Red litmus turns blue and blue litmus turns red.

D. Red litmus becomes colourless and blue litmus remains blue.

Answer: A



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11. A student takes about 2 mL ethanoic acid in a dry test tube and adds a pinch of sodium carbonate to it. What will he observe ?

A. A colourless and odourless gas evolves which burns with pop sound.

B. A colourless and odourless gas evolves with a brisk effervescence.

C. A brown coloured gas with foul smell evolves with a brisk effervescence.

D. A brown coloured gas with foul smell evolves which burns with pop sound.

Answer: B



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12. When you add a few drops of acetic acid to a test tube containing sodium bicarbonate powder, a gas is evolved which _____ .

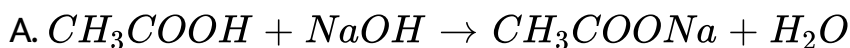
- A. burns with explosion
- B. has a foul smell of rotten eggs
- C. turns lime water milky
- D. has a fruity smell

Answer: C

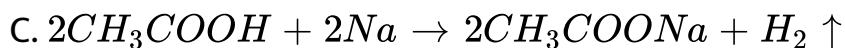
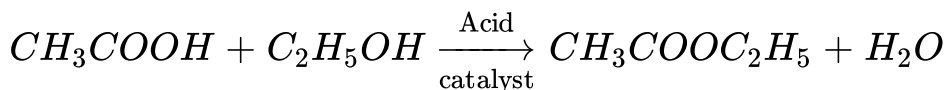


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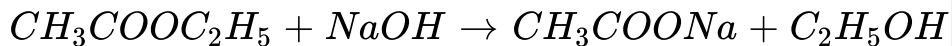
13. Which of the following represents esterification reaction ?



B.



D.



Answer: B



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14. When ethanoic acid reacts with ethanol, the product formed _____.

- A. is odourless
- B. has pungent odour
- C. has a foul smell of rotten eggs
- D. has a fruity smell

Answer: D



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15. Which of the following are main constituents of cooking gas ?

- A. Propane + Butane
- B. Butane + Benzene
- C. Propane + Benzene
- D. Methane + Acetylene

Answer: A



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23. In laboratory, a student added 3 mL ethanol and 5 mL sodium carbonate in a test tube and warmed the mixture for few minutes. He then slowly added few drops of potassium permanganate to this warm solution with constant stirring. He observed that the pink colour of potassium permanganate had disappeared. This is because _____

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- C. ethanol is oxidized to ethanoic acid

D. ethanol is oxidized to ethanoic acid

Answer: D



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24. When ethanol reacts with sodium, the products are _____ .

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B. sodium ethanoate and oxygen

C. sodium ethoxide and hydrogen

D. sodium ethoxide and oxygen

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Answer: B



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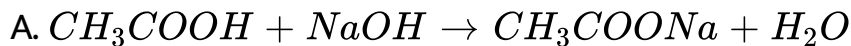
- A. burns with explosion
- B. has a foul smell of rotten eggs
- C. turns lime water milky
- D. has a fruity smell

Answer: C

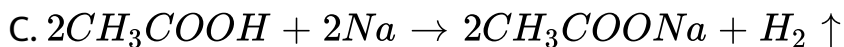
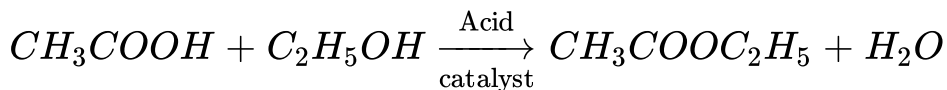


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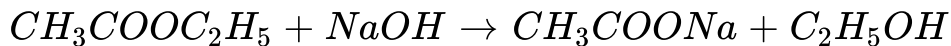
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B.



D.



Answer: B



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- B. has pungent odour
- C. has a foul smell of rotten eggs
- D. has a fruity smell

Answer: D



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- B. Butane + Benzene
- C. Propane + Benzene
- D. Methane + Acetylene

Answer: A



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Complete The Paragraph

1. (polymer, starch, rubber, macromolecules, nucleic acids, proteins, polyethylene, cellulose)

We know that some carbon compounds have large molecular masses up to 10^{12} . Such molecules are called a _____. They contain large number of single compound or different compounds joined together by chemical bonds. If the macromolecule is formed by regular repetition of a small unit, then it is called, a _____. the proteins and nucleic acids play an important role in our life. Our clothes, papers,

etc. are made up of polysaccharide called _____ and the polysaccharide that provides energy is _____. constitute large part of our body and are responsible for various physiological functions and growth. The natural macromolecules called _____ control the heredity.



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2. (polymer, starch, rubber, macromolecules, nucleic acids, proteins, polyethylene, cellulose)

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Name The Following

1. The property of carbon atom to form strong covalent bond with itself and results in formation of big molecules, is called _____



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2. Molecular formula of major component present in natural gas



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3. The phenomenon in which compounds having different structural formula have the same molecular formula



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4. The first member of the homologous series of alkynes.



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5. Name two commonly used oxidizing agent



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6. The process by which unsaturated fats are changed to saturated fats



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7. Name two catalysts used in hydrogenation of vegetable oils



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8. The reaction in which the place of one type of atom/group in a reactant is taken by another atom/group of atoms is called _____ reaction



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9. The gas which is liberated during the reaction of ethanol with sodium



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10. The common name of CH_3COOH



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11. The common name of CH_3COONa



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12. A small unit that repeats regularly to form a polymer.



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13. The monomer unit in PVC



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14. The polymer used for making injection syringe.



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15. The monomer which undergoes polymerization to form teflon



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16. An example for copolymer



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Watch Video Solution

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teflon



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32. An example for copolymer



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True Or False

1. Most of the carbon compounds are good conductors of electricity.



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2. The valence shell of carbon contains six electrons.



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3. Isobutylene contains a carbon-carbon triple bond.



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4. Combustion involves heating or burning of a substance strongly in presence of hydrogen.



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5. Naphthalene burns with a clean blue flame.



View Text Solution

6. Unsaturated fats containing double bonds are harmful to health.



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7. Ethanol mixed with poisonous propanol is called denatured spirit.



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8. Teflon is used to make winter clothing.



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9. State whether the following statements are true or false. If false then rewrite the correct statements: Generally, most of the carbon compounds are found to be good conductors of electricity.



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10. The valence shell of carbon contains six electrons.



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11. Isobutylene contains a carbon-carbon triple bond.



View Text Solution

12. Combustion involves heating or burning of a substance strongly in presence of hydrogen.



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13. Give Scientific reasons: Naphthalene burns with a yellow flame.



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14. Unsaturated fats containing double bonds are harmful to health.



View Text Solution

15. Ethanol mixed with poisonous propanol is called denatured spirit.



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16. Teflon is used to make winter clothing.



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Odd One Out

1. Carbon dioxide, methanol, acetaldehyde, propane



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2. Find the odd one out:

Ethane, ethene, ethyne, propene



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3. Find the odd one out:

Cyclohexene, cyclohexane, cyclopentane, isobutane



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4. Find the odd one out:

Methane, ethene, ethyne, ethanoic acid



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5. Find the odd one out:

Methanoic acid, acetic acid, propanoic acid, butanoic acid



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6. Polyethylene, polysaccharide, polystyrene, polypropylene



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7. Carbon dioxide, methanol, acetaldehyde, propane



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8. Find the odd one out:

Ethane, ethene, ethyne, propene



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9. Find the odd one out:

Cyclohexene, cyclohexane, cyclopentane, isobutane



Watch Video Solution

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Complete The Analogy

1. Nitrogen molecule : Triple bond :: Oxygen molecule :



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2. Carbon - carbon single bond : Alkanes :: Carbon- carbon triple bond : _____



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3. Alkynes : C_nH_{2n-2} :: Alkenes : _____



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4. Contains a single type of monomers : Homopolymers ::
Contains two or more types of monomers : _____



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5. Cellulose : glucose :: Rubber : _____.



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10. Cellulose : glucose :: Rubber : _____.



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Match The Following

1. Match the following :



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2. Match the paris



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3. Match the functional groups to their formulae.



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4. Match the following :



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5. Match the pairs :



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6. Match the pairs. :



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View Text Solution

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10. Match the following :



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12. Match the pairs. :



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Answer The Following Can You Recall

1. Answer the following questions in one word :

What are the types of compounds?



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2. Answer the following questions in one word :

Objects in everyday uses such as foodstuff, fibers, paper, medicines, wood fuels are made of various compounds.

Which constituent elements are common in these compounds?



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3. Answer the following questions in one word :

To which group in the periodic table does the element carbon belong? Write down the electronic configuration of carbon and deduce the valency of carbon.



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Answer The Following Can You Tell

1. Answer the following questions in one word :

What is meant by a chemical bond?



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2. Answer the following questions in one word :

What is the number of chemical bonds that an atom of an element forms called?



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3. Answer the following questions in one word :

What are the two important types of chemical bond?



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Answer The Following Intext Question

1. Are the melting and boiling point of carbon compounds (covalent compounds) higher or lower as compared to ionic compounds ?



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2. Why does carbon neither form C^{4+} cation nor C^{4-} anion, but forms covalent compounds?



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3. Explain the term with example : Covalent bond



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4. How is electron-dot structure of a molecule drawn ?

Explain giving example.



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5. Draw electron-dot structures with circles and line structures of the following molecules :

Hydrogen (H_2)



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6. Draw electron-dot structures with circles and line structures of the following molecules :

Nitrogen (N_2)



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7. Draw electron-dot structures with circles and line structures of the following molecules :

Oxygen (O_2)



[Watch Video Solution](#)

8. What causes the existence of very large number of carbon compounds?



[Watch Video Solution](#)

9. What causes the existence of very large number of carbon compounds?



[Watch Video Solution](#)

10. Explain two unique properties of carbon :

i. Catenation



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11. Explain two unique properties of carbon :

ii. Tetravalency :



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12. Write name and molecular formula of the smallest carbon compounds.





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13. Write a short note on hydrocarbons.



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14. Give any four examples of saturated hydrocarbons.



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15. Explain the steps to draw structural formula of ethane.



[Watch Video Solution](#)

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23. Carbon atoms come together in a large number to form extremely big molecules. What is the cause of this unique property of carbon?



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24. What causes the existence of very large number of carbon compounds?



[Watch Video Solution](#)

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[View Text Solution](#)

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[Watch Video Solution](#)

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[Watch Video Solution](#)

Answer The Following Use Your Brain Power

1. Atomic number of Chlorine is 17. What is the number of electrons in the valence shell of Chlorine?



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2. Molecular formula of chlorine is Cl_2 . Draw an electron dot and line structure of a chlorine molecule.



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3. The molecule formula of water is H_2O . Draw electron dot and line structure of this triatomic molecule (use dots for electron of oxygen atom and cross for electrons of hydrogen atom)



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4. The molecular formula of Ammonia is NH_3 Draw electron dot structure and line structure of ammonia molecule.



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5. The molecular formula of carbon-dioxide is CO_2 - Draw the electron dot structure (without showing cricle) and line structure of CO_2 .



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6. Answer the following questions in one word :

With which bond C atom in CO_2 is bonded to each of the O

atoms?



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7. The molecular formula of sulphur is S_8 in which eight sulphur atoms are bonded to each other to form a ring. Draw an electron-dot structure of S_8 without showing circles.



Watch Video Solution

8. Answer the following questions in one word :

Molecular formula of propane is C_3H_8 . From the Molecular formula draw its structural formula.



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9. The molecular formula of ethyne is C_2H_2 . From this, draw its structural formula and electron-dot structure.



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10. How many bonds have to be there in between the two carbon atoms in ethyne so as to satisfy their tetravalency ?



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Watch Video Solution

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Watch Video Solution

14. The molecular formula of Ammonia is NH_3 . Draw electron dot structure and line structure of ammonia molecule.



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[Watch Video Solution](#)

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20. How many bonds have to be there in between the two carbon atoms in ethyne so as to satisfy their tetravalency ?



[Watch Video Solution](#)

Answer The Following

1. Write the number of covalent bonds in the molecules of butane, C_4H_{10} .



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2. Explain the steps to draw structural formula of ethane.



[Watch Video Solution](#)

3. Draw an electron-dot structure of the following molecules (without showing the circles).

i. Methane



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4. Draw an electron-dot structure of the following molecules (without showing the circles).

ii. Ethene



[Watch Video Solution](#)

5. Draw an electron-dot structure of the following molecules (without showing the circles).

iii. Methanol



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6. Draw an electron-dot structure of the following molecules (without showing the circles).

iv. Water



Watch Video Solution

7. Write the molecular formulae and draw electron-dot structures of the following compounds :

i. Ethane



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8. Answer the following questions: Draw an electron dot structure of the following molecules: Ethene



[Watch Video Solution](#)

9. Explain the term with example : Unsaturated hydrocarbon



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10. What is the difference between saturated hydrocarbons and unsaturated hydrocarbons ?



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11. Write a short note on : Crude oil



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12. Explain the term with example : Structural isomerism



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13. Draw all possible structural formulae of compounds from their molecular formulae given below.

i. C_3H_8



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14. Draw all possible structural formula of compounds from their molecular formula given below: C_4H_{10}



Watch Video Solution

15. Draw all possible structural formulae of compounds from their molecular formulae given below.

iii. C_3H_4



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16. Write the molecular formula of the following :

i. Hexane



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17. Write the molecular formula of the following :

ii. Cyclohexane



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18. Draw electron dot structure of cyclohexane.



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19. Saturated hydrocarbons are classified into three types.

Write these names giving one example each.



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20. Explain the structure of benzene .



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21. Define the following : Hetero atom in a carbon compound



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22. Explain the term with example : Functional group



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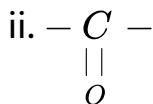
23. Write the name of each of the following functional group
:

i. $-OH$



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24. Write the name of each of the following functional group :



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25. Answer the following questions:

Give any four functional group containing oxygen as the heteroatom in it. Write name and structural formula and one example each.



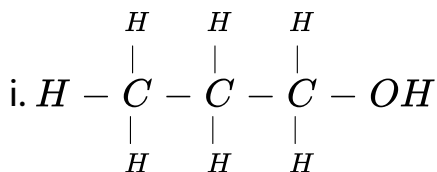
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26. Give names of three functional groups containing three heteroatoms, write names and structural formulae and one example each.



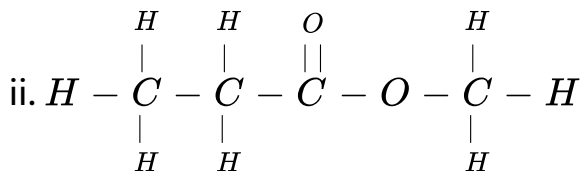
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27. Identify and name the functional groups present in the following compounds.



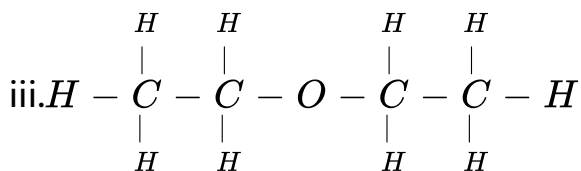
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28. Identify and name the functional groups present in the following compounds.



Watch Video Solution

29. Identify and name the functional groups present in the following compounds.



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30. With the help of an example explain what is mean by homologous series.



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31. State the characteristics of a homologous series.



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32. Write the molecular formulae of the first two members of the homologous series having functional group, $-COOH$.



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33. Answer the following questions: By how many $-CH_2-$ (methylene) units do the formulae and the first two members of homologous series of alkane, methane (CH_4) and ethane (C_2H_6) differ? Similarly, by how many $-CH_2-$ units do the neighboring members ethane (C_2H_6) and propane (C_3H_8) differ from each other?



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34. How many methylene units are extra in the formula of the fourth member than the third members of the homologous series of alcohols?



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35. How many methylene units are less in the formula of the second member than the third member of two homologous series of alkenes?



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36. Explain the term with example : Alkane



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37. What would be the general formula for the molecular formulae of the members of the homologous series of alkanes ? What would be the value of 'n' for the first member of this series ?



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38. The general molecular formula for the homologous series of alkynes is C_nH_{2n-2} . Write down the individual molecular formulae of the value 2, 3 and 4 respectively for 'n' in this formula.

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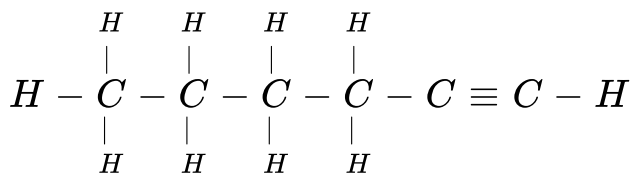
39. Complete the following flowchart and write the general formula of alkane :

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40. State rules for the IUPAC nomenclature of carbon compounds. Give one example.

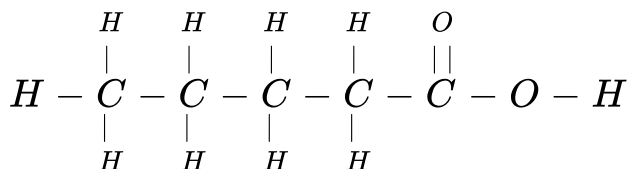
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41. How would you name the following compounds ?



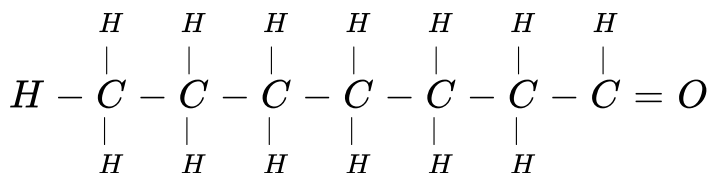
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42. Write the IUPAC names of the following compounds :



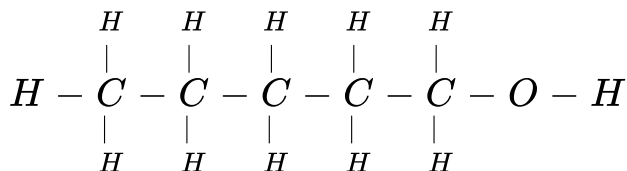
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43. Write the IUPAC names of the following compounds :



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44. Write the IUPAC names of the following compounds :



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45. Write the IUPAC names of the following structural formulae.



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46. Write the IUPAC name of the following structural formula:



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47. Write the IUPAC names of the following structural formula: $CH_3CH_2 - COOH$



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48. Write the IUPAC names of the following structural formulae.



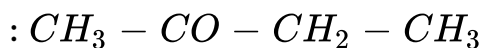
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49. Write the IUPAC names of the following structural formula: $CH_3 - CHO$



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50. Write the IUPAC name of the following structural formula



Watch Video Solution

51. Write structural formulae for the following IUPAC names:

Pentan-2-one Molecular formula- $C_5H_{10}O$



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52. Write structural formulae for the following IUPAC names:

2-Chlorobutane: Molecular formula C_4H_9Cl



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53. Write structural formulae for the following IUPAC names:

Propan-2-ol: Molecular formula- C_3H_7OH



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54. Write structural formulae for the following IUPAC names:

Methanal Molecular formula- CH_2O



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55. Write structural formulae for the following IUPAC names:

Butanoic acid: Molecular formula- $C_4H_8O_2$ or

$CH_3CH_2CH_2COOH$



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56. Write structural formulae for the following IUPAC names:

1-bromopropane: Molecular formula- C_3H_7Br



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57. Write structural formulae for the following IUPAC names:

Ethanamine : Molecular formula- $C_2H_5 - NH_2$



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58. Write structural formulae for the following IUPAC names:

Butanone Molecular formula- C_4H_8O



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59. Answer the following questions in one word :

Which is the component of biogas that makes it useful as fuel.



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60. Answer the following questions in one word :

Which product is formed by the combustion of elemental carbon?



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61. Answer the following questions in one word :

Is the biogas combustion reaction endothermic or exothermic.



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62. Answer the following questions in one word :

Propane (C_3H_8) is one of the combustible component of LPG. Write down the reaction for propane (C_3H_8)



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63. Which of the following compounds will burn with a sooty flame?



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64. The gas stoves have inlets for air. Explain.



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65. Define the following/write notes:

Oxidation Reaction



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66. Explain the following reactions with examples :

Combustion reaction



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67. Define the following : Oxidant



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68. How is the transformation of ethanol into ethanoic acid an oxidation reaction?



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69. Define the following : Reduction



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70. What is a catalyst? Write any one reaction which is brought about by use of a catalyst.



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71. Differentiate between: Saturated and unsaturated Hydrocarbons.



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72. What is a substitution reaction? Write the reaction involved in the chlorination of methane.



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73. What is the difference between addition reaction and substitution reaction ?



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74. You have learnt about four types of common reaction in the previous chapter. In which of these four types, the addition and substitution reaction of carbon compounds can be included? What are the additional details and included? What are the additional details and difference in the addition and substitution reaction?



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75. An organic compound P has molecular formula C_2H_4 . On reduction, it gives another compound Q with molecular formula C_2H_6 . Q reacts with chlorine in the presence of sunlight to give R having molecular formula C_2H_5Cl .

Identify P, Q and R.



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76. An organic compound P has molecular formula C_2H_4 . On reduction, it gives another compound Q with molecular formula C_2H_6 . Q reacts with chlorine in the presence of sunlight to give R having molecular formula C_2H_5Cl .

ii. Write the chemical equation for the conversion of P to Q.



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77. Write any two physical properties of ethanol.



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78. What is denatured spirit?



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79. What are the harmful effects of ethanol?



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80. When ethanol is heated at $170^{\circ}C$ with conc. H_2SO_4 , it forms an organic compound 'A' and water. The compound 'A' reacts with hydrogen in the presence of nickel to form 'B'.

i. Name the compounds A and B. Write the chemical equations of the reactions involved.



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81. When ethanol is heated at $170^{\circ}C$ with conc. H_2SO_4 , it forms an organic compound 'A' and water. The compound 'A'

reacts with hydrogen in the presence of nickel to form 'B'.

ii. Identify the homologous series to which A and B belongs.



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82. When ethanol is heated at 170°C with conc. H_2SO_4 , it forms an organic compound 'A' and water. The compound 'A' reacts with hydrogen in the presence of nickel to form 'B'.

iii. Name the products formed when 'B' undergoes combustion in presence of sufficient amount of oxygen. Write its chemical equation.



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83. What is meant by vinegar and gasohol? What are their uses?



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84. Answer the following questions: State the physical properties of ethanoic acid.



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85. Answer the following questions in one word :

What is glacial acetic acid?



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86. Will the salt sodium acetate be neutral?



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87. What are esters? Explain the preparation of ethyl ethanoate with the help of neat labelled diagram.



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88. Give two uses of esters.



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89. Identify the type of the following reaction of carbon compounds:

- (1) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COOH}$
- (2) $\text{CH}_3\text{-CH}_2\text{-CH}_2 + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$
- (3) $\text{CH}_3\text{-CH=CH-CH}_3 + \text{Br}_2 \rightarrow \text{CH}_3\text{-CHBr-CHBr-CH}_3$
- (4) $\text{CH}_3\text{-CH}_3 + \text{Cl}_2 \rightarrow \text{CH}_3\text{-CH}_2\text{-Cl} + \text{HCl}$
- (5) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-CH=CH}_2 + \text{H}_2\text{O}$
- (6) $\text{CH}_3\text{-CH}_2\text{-COOH} + \text{NaOH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COONa} + \text{H}_2\text{O}$
- (7) $\text{CH}_3\text{-COOH} + \text{CH}_3\text{-OH} \rightarrow \text{CH}_3\text{-COOCH}_3 + \text{H}_2\text{O}$
- (8) $\text{CH}_3\text{COOC}_2\text{H}_5 + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + \text{C}_2\text{H}_5\text{OH}$
- (9) $\text{CH}_2=\text{CH}_2 + \text{Br}_2 \rightarrow \text{Br-CH}_2\text{-CH}_2\text{-Br}$
- (10) $2\text{CH}_3\text{OH} + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 4\text{H}_2\text{O}$
- (11) $\text{CH}_3\text{CH}_2\text{OH} + 2[\text{O}] \rightarrow \text{CH}_3\text{COOH} + \text{H}_2\text{O}$



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90. Identify the type of the following reaction of carbon compounds:

- (1) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COOH}$
- (2) $\text{CH}_3\text{-CH}_2\text{-CH}_2 + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$
- (3) $\text{CH}_3\text{-CH=CH-CH}_3 + \text{Br}_2 \rightarrow \text{CH}_3\text{-CHBr-CHBr-CH}_3$
- (4) $\text{CH}_3\text{-CH}_3 + \text{Cl}_2 \rightarrow \text{CH}_3\text{-CH}_2\text{-Cl} + \text{HCl}$
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- (7) $\text{CH}_3\text{-COOH} + \text{CH}_3\text{-OH} \rightarrow \text{CH}_3\text{-COOCH}_3 + \text{H}_2\text{O}$
- (8) $\text{CH}_3\text{COOC}_2\text{H}_5 + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + \text{C}_2\text{H}_5\text{OH}$
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- (10) $2\text{CH}_3\text{OH} + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 4\text{H}_2\text{O}$
- (11) $\text{CH}_3\text{CH}_2\text{OH} + 2[\text{O}] \rightarrow \text{CH}_3\text{COOH} + \text{H}_2\text{O}$

91. Identify the type of the following reaction of carbon compounds:

- (1) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COOH}$
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- (3) $\text{CH}_3\text{-CH=CH-CH}_3 + \text{Br}_2 \rightarrow \text{CH}_3\text{-CHBr-CHBr-CH}_3$
- (4) $\text{CH}_3\text{-CH}_3 + \text{Cl}_2 \rightarrow \text{CH}_3\text{-CH}_2\text{-Cl} + \text{HCl}$
- (5) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-CH=CH}_2 + \text{H}_2\text{O}$
- (6) $\text{CH}_3\text{-CH}_2\text{-COOH} + \text{NaOH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COONa} + \text{H}_2\text{O}$
- (7) $\text{CH}_3\text{-COOH} + \text{CH}_3\text{-OH} \rightarrow \text{CH}_3\text{-COOCH}_3 + \text{H}_2\text{O}$
- (8) $\text{CH}_3\text{COOC}_2\text{H}_5 + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + \text{C}_2\text{H}_5\text{OH}$
- (9) $\text{CH}_2=\text{CH}_2 + \text{Br}_2 \rightarrow \text{Br-CH}_2\text{-CH}_2\text{-Br}$
- (10) $2\text{CH}_3\text{OH} + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 4\text{H}_2\text{O}$
- (11) $\text{CH}_3\text{CH}_2\text{OH} + 2[\text{O}] \rightarrow \text{CH}_3\text{COOH} + \text{H}_2\text{O}$

92. Identify the type of the following reaction of carbon compounds:

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- (4) $\text{CH}_3\text{-CH}_3 + \text{Cl}_2 \rightarrow \text{CH}_3\text{-CH}_2\text{-Cl} + \text{HCl}$
- (5) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-CH=CH}_2 + \text{H}_2\text{O}$
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- (8) $\text{CH}_3\text{COOC}_2\text{H}_5 + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + \text{C}_2\text{H}_5\text{OH}$
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- (10) $2\text{CH}_3\text{OH} + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 4\text{H}_2\text{O}$
- (11) $\text{CH}_3\text{CH}_2\text{OH} + 2[\text{O}] \rightarrow \text{CH}_3\text{COOH} + \text{H}_2\text{O}$



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93. Identify the type of the following reaction of carbon compounds:

- (1) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COOH}$
- (2) $\text{CH}_3\text{-CH}_2\text{-CH}_2 + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$
- (3) $\text{CH}_3\text{-CH=CH-CH}_3 + \text{Br}_2 \rightarrow \text{CH}_3\text{-CHBr-CHBr-CH}_3$
- (4) $\text{CH}_3\text{-CH}_3 + \text{Cl}_2 \rightarrow \text{CH}_3\text{-CH}_2\text{-Cl} + \text{HCl}$
- (5) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-CH=CH}_2 + \text{H}_2\text{O}$
- (6) $\text{CH}_3\text{-CH}_2\text{-COOH} + \text{NaOH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COONa} + \text{H}_2\text{O}$
- (7) $\text{CH}_3\text{-COOH} + \text{CH}_3\text{-OH} \rightarrow \text{CH}_3\text{-COOCH}_3 + \text{H}_2\text{O}$
- (8) $\text{CH}_3\text{COOC}_2\text{H}_5 + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + \text{C}_2\text{H}_5\text{OH}$
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- (11) $\text{CH}_3\text{CH}_2\text{OH} + 2[\text{O}] \rightarrow \text{CH}_3\text{COOH} + \text{H}_2\text{O}$

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94. Identify the type of the following reaction of carbon compounds:

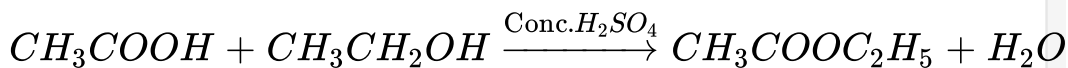
- (1) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COOH}$
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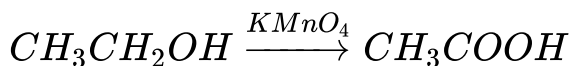
95. Identify the type of the following reaction of carbon compounds.

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96. State the role of reagents shown on arrows in the following chemical reactions.

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97. State the role of reagents shown on arrows in the following chemical reactions.

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98. What is saponification?



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99. Define the following terms :

Macromolecules



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100. Define the following terms :

Polymers



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101. Define the following terms :

Polymerization



[Watch Video Solution](#)

102. Define the following terms :

Copolymer



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103. Explain the term with example : Monomer



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104. Explain the terms with example : Homopolymer



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105. Give four examples of the following :

Natural macromolecules



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106. Give four examples of the following :

Manmade macromolecules



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107. Give four examples of the following :

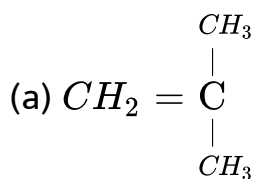
Homopolymers



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108. Structural formulae of some monomers are given below.

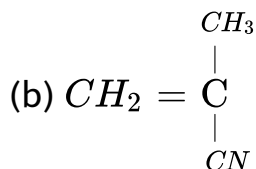
Write the structural formula of the homopolymer formed from them.



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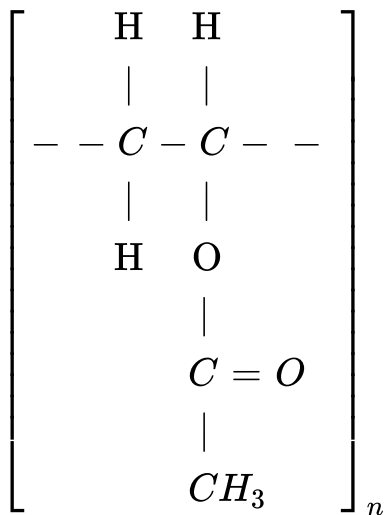
109. Structural formulae of some monomers are given below.

Write the structural formula of the homopolymer formed from them.



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110. From the given structural formula of polyvinyl acetate, that is used in paints and glues, deduce the name and structural formula of the corresponding monomer.



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111. Give names of three natural polymers. Write the place of their occurrence and names of monomers from which they are formed.



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 Watch Video Solution

112. Write the number of covalent bonds in the molecules of butane, C_4H_{10} .

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113. Explain the steps to draw structural formula of ethane.

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114. Draw an electron-dot structure of the following molecules (without showing the circles).

i. Methane

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115. Draw an electron-dot structure of the following molecules (without showing the circles).

ii. Ethene



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116. Draw an electron-dot structure of the following molecules (without showing the circles).

iii. Methanol



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117. Draw an electron-dot structure of the following molecules (without showing the circles).

iv. Water



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118. Write the molecular formulae and draw electron-dot structures of the following compounds :

i. Ethane



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119. Write the molecular formulae and draw electron-dot structures of the following compounds :

i. Ethane



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120. Explain the term with example : Unsaturated hydrocarbon



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121. What is the difference between saturated hydrocarbons and unsaturated hydrocarbons ?



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122. Write a short note on : Crude oil



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123. Explain the term with example : Structural isomerism



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124. Draw all possible structural formulae of compounds from their molecular formulae given below.

i. C_3H_8



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125. Draw all possible structural formula of compounds from their molecular formula given below: C_4H_{10}



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126. Draw all possible structural formulae of compounds from their molecular formulae given below.

iii. C_3H_4



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127. Write the molecular formula of the following :

i. Hexane



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128. Write the molecular formula of the following :

ii. Cyclohexane



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129. Draw electron dot structure of cyclohexane.



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130. Saturated hydrocarbons are classified into three types.

Write these names giving one example each.



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131. Explain the structure of benzene .



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132. Explain the term with example : Hetero atom in a carbon compound



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133. Explain the term with example : Functional group



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134. Write the name of each of the following functional group

:

i. $-OH$



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135. Write the name of each of the following functional group

:

ii. $\begin{array}{c} -C- \\ || \\ O \end{array}$



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136. Answer the following questions:

Give any four functional group containing oxygen as the heteroatom in it. Write name and structural formula and one example each.



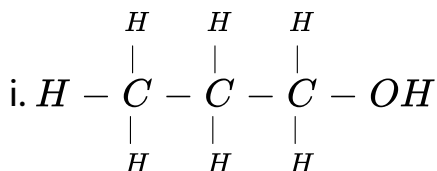
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137. Give names of three functional groups containing three heteroatoms, write names and structural formulae and one example each.



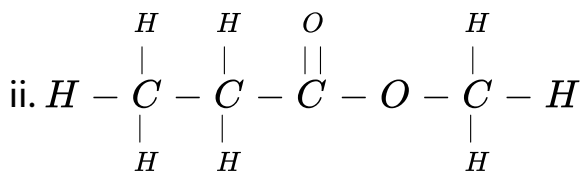
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138. Identify and name the functional groups present in the following compounds.



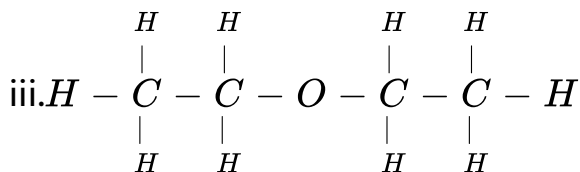
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139. Identify and name the functional groups present in the following compounds.



Watch Video Solution

140. Identify and name the functional groups present in the following compounds.



Watch Video Solution

141. With the help of an example explain what is mean by homologous series.



Watch Video Solution

142. State the characteristics of a homologous series.



Watch Video Solution

143. Write the molecular formulae of the first two members of the homologous series having functional group, $-COOH$.



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144. Answer the following questions: By how many $-CH_2-$ (methylene) units do the formulae and the first two members of homologous series of alkane, methane (CH_4) and ethane (C_2H_6) differ? Similarly, by how many $-CH_2-$ Units do the neighboring members ethane (C_2H_6) and propane (C_3H_8) differ from each other?



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145. How many methylene units are extra in the formula of the fourth member than the third members of the homologous series of alcohols?



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146. How many methylene units are less in the formula of the second member than the third member of two homologous series of alkenes?



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147. Explain the term with example : Alkane



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148. What would be the general formula for the molecular formulae of the members of the homologous series of alkanes ? What would be the value of 'n' for the first member of this series ?



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149. The general molecular formula for the homologous series of alkynes is C_nH_{2n-2} . Write down the individual molecular formulae of the value 2, 3 and 4 respectively for 'n' in this formula.



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150. Complete the following flowchart and write the general formula of alkane :



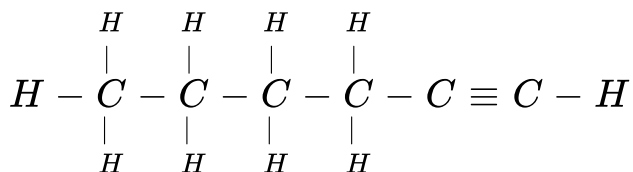
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151. State rules for the IUPAC nomenclature of carbon compounds. Give one example.



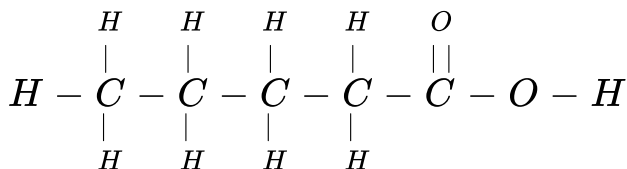
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152. How would you name the following compounds ?



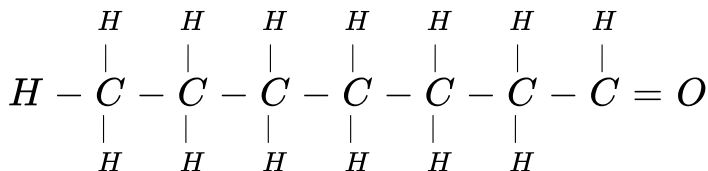
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153. Write the IUPAC names of the following compounds :



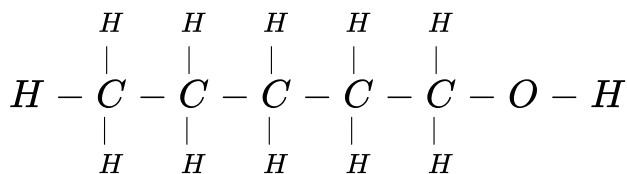
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154. Write the IUPAC names of the following compounds :



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155. Write the IUPAC names of the following compounds :



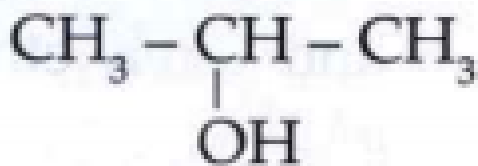
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156. Write the IUPAC names of the following structural formulae.



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157. Write the IUPAC name of the following structural formula:



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158. Write the IUPAC names of the following structural formula: $\text{CH}_3\text{CH}_2 - \text{COOH}$



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159. Write the IUPAC names of the following structural formulae.



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160. Write the IUPAC names of the following structural formula: $CH_3 - CHO$



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161. Write the IUPAC name of the following structural formula
: $CH_3 - CO - CH_2 - CH_3$



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162. Write structural formulae for the following IUPAC names:

Pentan-2-one Molecular formula- $C_5H_{10}O$



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163. Write structural formulae for the following IUPAC names:

2-Chlorobutane: Molecular formula C_4H_9Cl



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164. Write structural formulae for the following IUPAC names:

Propan-2-ol: Molecular formula- C_3H_7OH



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165. Write structural formulae for the following IUPAC names:

Methanal Molecular formula- CH_2O



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166. Write structural formulae for the following IUPAC names:

Butanoic acid: Molecular formula- $C_4H_8O_2$ or

$CH_3CH_2CH_2COOH$



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167. Write structural formulae for the following IUPAC names:

1-bromopropane: Molecular formula- C_3H_7Br



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168. Write structural formulae for the following IUPAC names:

Ethanamine : Molecular formula- $C_2H_5 - NH_2$



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169. Write structural formulae for the following IUPAC names:

Butanone Molecular formula- C_4H_8O



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170. Answer the following questions in one word :

Which is the component of biogas that makes it useful as fuel.



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171. Answer the following questions in one word :

Which product is formed by the combustion of elemental carbon?



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172. Answer the following questions in one word :

Is the biogas combustion reaction endothermic or exothermic.



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173. Answer the following questions in one word :

Propane (C_3H_8) is one of the combustible component of LPG. Write down the reaction for propane (C_3H_8)



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174. Which of the following compounds burns with sooty flame?



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175. The gas stoves have inlets for air. Explain.



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176. Define the following/write notes:

Oxidation Reaction



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177. Explain the following reactions with examples :

Combustion reaction



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178. Define the following : Oxidant



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179. How is the transformation of ethanol into ethanoic acid an oxidation reaction?



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180. Define the following : Reduction



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181. What is a catalyst? Write any one reaction which is brought about by use of a catalyst.



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182. Differentiate between: Saturated and unsaturated Hydrocarbons.



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183. What is a substitution reaction? Write the reaction involved in the chlorination of methane.



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184. What is the difference between addition reaction and substitution reaction ?



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185. You have learnt about four types of common reaction in the previous chapter. In which of these four types, the addition and substitution reaction of carbon compounds can be included? What are the additional details and included?

What are the additional details and difference in the addition and substitution reaction?



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186. An organic compound P has molecular formula C_2H_4 . On reduction, it gives another compound Q with molecular formula C_2H_6 . Q reacts with chlorine in the presence of sunlight to give R having molecular formula C_2H_5Cl .

Identify P, Q and R.



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187. An organic compound P has molecular formula C_2H_4 . On reduction, it gives another compound Q with molecular formula C_2H_6 . Q reacts with chlorine in the presence of

sunlight to give R having molecular formula C_2H_5Cl .

ii. Write the chemical equation for the conversion of P to Q.



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188. Write any two physical properties of ethanol.



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189. What is denatured spirit?



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190. What are the harmful effects of ethanol?



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191. When ethanol is heated at $170^{\circ}C$ with conc. H_2SO_4 , it forms an organic compound 'A' and water. The compound 'A' reacts with hydrogen in the presence of nickel to form 'B'.

i. Name the compounds A and B. Write the chemical equations of the reactions involved.



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192. When ethanol is heated at $170^{\circ}C$ with conc. H_2SO_4 , it forms an organic compound 'A' and water. The compound 'A' reacts with hydrogen in the presence of nickel to form 'B'.

ii. Identify the homologous series to which A and B belongs.



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193. When ethanol is heated at $170^{\circ}C$ with conc. H_2SO_4 , it forms an organic compound 'A' and water. The compound 'A' reacts with hydrogen in the presence of nickel to form 'B'.

iii. Name the products formed when 'B' undergoes combustion in presence of sufficient amount of oxygen. Write its chemical equation.



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194. What is meant by vinegar and gasohol? What are their uses?



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195. Answer the following questions: State the physical properties of ethanoic acid.



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196. Answer the following questions in one word :

What is glacial acetic acid?



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197. Will the salt sodium acetate be neutral?



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198. What is esterification reaction? Explain the preparation of an ester with the help of a neat labelled diagram.



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199. Give two uses of esters.



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200. Identify the type of the following reaction of carbon compounds:

- (1) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COOH}$
- (2) $\text{CH}_3\text{-CH}_2\text{-CH}_2 + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$
- (3) $\text{CH}_3\text{-CH=CH-CH}_3 + \text{Br}_2 \rightarrow \text{CH}_3\text{-CHBr-CHBr-CH}_3$
- (4) $\text{CH}_3\text{-CH}_3 + \text{Cl}_2 \rightarrow \text{CH}_3\text{-CH}_2\text{-Cl} + \text{HCl}$
- (5) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-CH=CH}_2 + \text{H}_2\text{O}$
- (6) $\text{CH}_3\text{-CH}_2\text{-COOH} + \text{NaOH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COONa} + \text{H}_2\text{O}$
- (7) $\text{CH}_3\text{-COOH} + \text{CH}_3\text{-OH} \rightarrow \text{CH}_3\text{-COOCH}_3 + \text{H}_2\text{O}$
- (8) $\text{CH}_3\text{COOC}_2\text{H}_5 + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + \text{C}_2\text{H}_5\text{OH}$
- (9) $\text{CH}_2=\text{CH}_2 + \text{Br}_2 \rightarrow \text{Br-CH}_2\text{-CH}_2\text{-Br}$
- (10) $2\text{CH}_3\text{OH} + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 4\text{H}_2\text{O}$
- (11) $\text{CH}_3\text{CH}_2\text{OH} + 2[\text{O}] \rightarrow \text{CH}_3\text{COOH} + \text{H}_2\text{O}$



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201. Identify the type of the following reaction of carbon compounds:

- (1) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COOH}$
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- (4) $\text{CH}_3\text{-CH}_3 + \text{Cl}_2 \rightarrow \text{CH}_3\text{-CH}_2\text{-Cl} + \text{HCl}$
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- (6) $\text{CH}_3\text{-CH}_2\text{-COOH} + \text{NaOH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COONa} + \text{H}_2\text{O}$
- (7) $\text{CH}_3\text{-COOH} + \text{CH}_3\text{-OH} \rightarrow \text{CH}_3\text{-COOCH}_3 + \text{H}_2\text{O}$
- (8) $\text{CH}_3\text{COOC}_2\text{H}_5 + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + \text{C}_2\text{H}_5\text{OH}$
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- (10) $2\text{CH}_3\text{OH} + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 4\text{H}_2\text{O}$
- (11) $\text{CH}_3\text{CH}_2\text{OH} + 2[\text{O}] \rightarrow \text{CH}_3\text{COOH} + \text{H}_2\text{O}$

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202. Identify the type of the following reaction of carbon compounds:

- (1) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COOH}$
- (2) $\text{CH}_3\text{-CH}_2\text{-CH}_2 + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$
- (3) $\text{CH}_3\text{-CH=CH-CH}_3 + \text{Br}_2 \rightarrow \text{CH}_3\text{-CHBr-CHBr-CH}_3$
- (4) $\text{CH}_3\text{-CH}_3 + \text{Cl}_2 \rightarrow \text{CH}_3\text{-CH}_2\text{-Cl} + \text{HCl}$
- (5) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-CH=CH}_2 + \text{H}_2\text{O}$
- (6) $\text{CH}_3\text{-CH}_2\text{-COOH} + \text{NaOH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COONa} + \text{H}_2\text{O}$
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- (8) $\text{CH}_3\text{COOC}_2\text{H}_5 + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + \text{C}_2\text{H}_5\text{OH}$
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- (11) $\text{CH}_3\text{CH}_2\text{OH} + 2[\text{O}] \rightarrow \text{CH}_3\text{COOH} + \text{H}_2\text{O}$

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- (4) $\text{CH}_3\text{-CH}_3 + \text{Cl}_2 \rightarrow \text{CH}_3\text{-CH}_2\text{-Cl} + \text{HCl}$
- (5) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-CH=CH}_2 + \text{H}_2\text{O}$
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- (11) $\text{CH}_3\text{CH}_2\text{OH} + 2[\text{O}] \rightarrow \text{CH}_3\text{COOH} + \text{H}_2\text{O}$



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204. Identify the type of the following reaction of carbon compounds:

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- (2) $\text{CH}_3\text{-CH}_2\text{-CH}_2 + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$
- (3) $\text{CH}_3\text{-CH=CH-CH}_3 + \text{Br}_2 \rightarrow \text{CH}_3\text{-CHBr-CHBr-CH}_3$
- (4) $\text{CH}_3\text{-CH}_3 + \text{Cl}_2 \rightarrow \text{CH}_3\text{-CH}_2\text{-Cl} + \text{HCl}$
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205. Identify the type of the following reaction of carbon compounds:

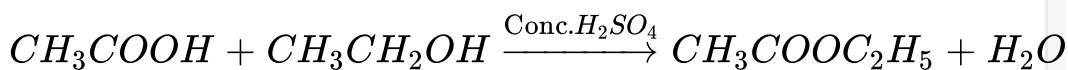
- (1) $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH} \rightarrow \text{CH}_3\text{-CH}_2\text{-COOH}$
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206. Identify the type of the following reaction of carbon compounds.

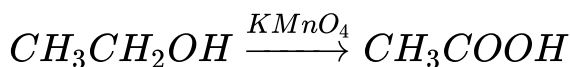
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207. State the role of reagents shown on arrows in the following chemical reactions.



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208. State the role of reagents shown on arrows in the following chemical reactions.



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209. What is saponification?



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210. Define the following terms :

Macromolecules



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211. Define the following terms :

Polymers



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212. Define the following terms :

Polymerization



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213. Define the following terms :

Copolymer



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214. Explain the term with example : Monomer



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215. Explain the terms with example : Homopolymer



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216. Give four examples of the following :

Natural macromolecules



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217. Give four examples of the following :

Manmade macromolecules



Watch Video Solution

218. Give four examples of the following :

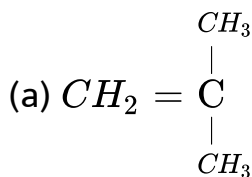
Homopolymers



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219. Structural formulae of some monomers are given below.

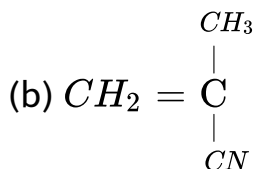
Write the structural formula of the homopolymer formed from them.



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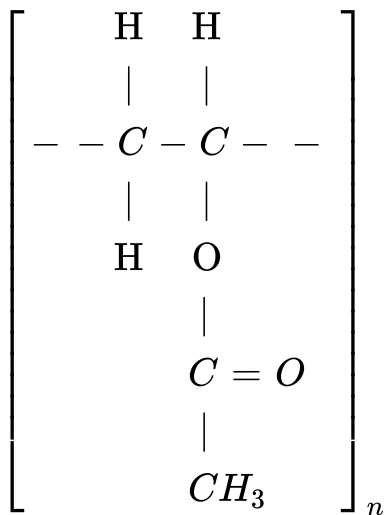
220. Structural formulae of some monomers are given below.

Write the structural formula of the homopolymer formed from them.



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221. From the given structural formula of polyvinyl acetate, that is used in paints and glues, deduce the name and structural formula of the corresponding monomer.



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222. Give names of three natural polymers. Write the place of their occurrence and names of monomers from which they are formed.



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 Watch video solution

Give Reasons

1. Carbon is a tetravalent atom.



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2. Carbon generally forms compounds by covalent bonds.



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3. A wax candle burns with yellow flame.

iii. These carbon particles rise in the the flame, get heated

and glow to impart yellowish colour to the flame.

Hence, a wax candle burns with yellow flame.



[View Text Solution](#)

4. Propene undergoes addition reaction.

iii. Unsaturated compounds contain multiple bonds as their functional group and hence, they undergo addition reaction to form a saturated compound as the product.

Hence, propene undergoes addition reaction.



[View Text Solution](#)

5. Carbon is a tetravalent atom.



[View Text Solution](#)

6. Carbon generally forms compounds by covalent bonds.



View Text Solution

7. A wax candle burns with yellow flame.

iii. These carbon particles rise in the the flame, get heated and glow to impart yellowish colour to the flame.

Hence, a wax candle burns with yellow flame.



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8. Propene undergoes addition reaction.

iii. Unsaturated compounds contain multiple bonds as their functional group and hence, they undergo addition reaction

to forms a saturated compound as the product.

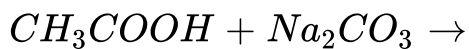
Hence, propene undergoes addition reaction.



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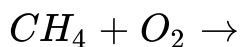
Give Balanced Chemical Equation

1. Complete the following equations :



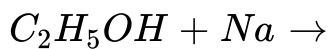
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2. Complete the following equations :



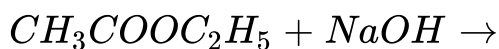
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3. Complete the following equations :



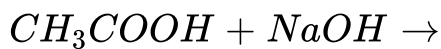
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4. Complete the following equations :



Watch Video Solution

5. Complete the following equations :



Watch Video Solution

6. Complete the following equations :



Watch Video Solution

7. Write the chemical equation for the conversion of ethanol to ethanoic acid in the presence of $KMnO_4$.



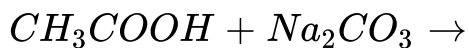
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8. Answer the following questions: How is ethene prepared from ethanol? Give the reaction involved in it.



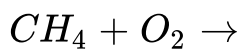
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9. Complete the following equations :



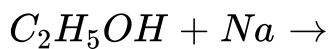
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10. Complete the following equations :



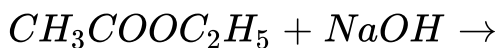
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11. Complete the following equations :



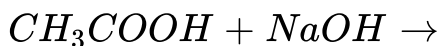
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12. Complete the following equations :



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13. Complete the following equations :



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14. Complete the following equations :



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15. Write the chemical equation for the conversion of ethanol to ethanoic acid in the presence of $KMnO_4$.



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16. Answer the following questions: How is ethene prepared from ethanol? Give the reaction involved in it.



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Distinguish Between

1. Differentiate between: Covalent compounds and Ionic compounds.



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2. Differentiate between: Saturated and unsaturated Hydrocarbons.



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3. Differentiate between: Covalent compounds and Ionic compounds.



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4. What is the difference between saturated hydrocarbons and unsaturated hydrocarbons ?



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Complete The Given Chart Table

1. The first column of the following table shows straight chains of carbon atom. Write the structural formulae of the corresponding straight chain hydrocarbons in the second column satisfying the tetravalency to the carbon atom by joining them to hydrogen atoms. Work out the molecular formula from this and write it down in the third column. The name of the hydrocarbon is given in the fourth column.



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2. Complete the following chat.



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3. Complete the table :

Fill in the gaps in the following tables of different homologous series.

i. Homologous series of alkanes :

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4. Complete the table :

Fill in the gaps in the following tables of different homologous series.

ii. Homologous series of alcohols:



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5. Complete the table :

Fill in the gaps in the following tables of different homologous series.

iii. Homologous series of alkenes :

[View Text Solution](#)

6. Write the names of first four members of homologous series of alcohols.

[View Text Solution](#)

7. Complete the following table.



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8. Complete the table.

The following table shown common names and structural formulae of a few carbon compounds.

Complete the table by writing their IUPAC names in the third column.



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9. Complete the following table.



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10. Given the table below, identify substances which contain multiple bonds. Indicate number of multiple bonds and also identify substances which decolourize I_2 .



[View Text Solution](#)

11. Complete the following table :



[View Text Solution](#)

[View Text Solution](#)

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14. Complete the table :

Fill in the gaps in the following tables of different homologous series.

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22. Complete the following table :



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Questions Based On Diagram

1. Given below are two different types of molecular models of methane.

Identify ball and stick model and space filling model.



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2. Given below are two different types of molecular models of methane.

Identify ball and stick model and space filling model.



[View Text Solution](#)

[View Text Solution](#)

3. The experimental setup showing the reaction between ethanoic acid and sodium carbonate is as shown below :



Identify the gas evolved in the above experiment.

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4. The experimental setup showing the reaction between ethanoic acid and sodium carbonate is as shown below :



What happens when the evolved gas reacts with lime water ?

Give the chemical equation involved.

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iii. Write the chemical equation for the reaction of ethanoic acid with sodium carbonate.



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Questions Based On Paragraph

1. Give Scientific reasons: Carbon can form a large number of compounds.



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2. Carbon forms a large number of compounds because of its two unique properties. It forms many long straight chains of carbon, branched chains of carbon or rings of carbon. In these compounds, carbon atoms may form single, double or triple covalent bonds. Compounds in which the carbon atoms are linked to each other by single bonds are called saturated carbon compounds whereas compounds having at least one carbon-carbon double or triple bond are

called unsaturated carbon compounds. Compounds containing only carbon and hydrogen are known as hydrocarbons. Based on the above information, answer the following questions.

ii. Give two examples of carbon compounds which have ring structure.



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iii. What are saturated hydrocarbons? Give one example.



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iv. Give IUPAC names of first two members of hydrocarbon which contain carbon-carbon double bonds.



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5. Carbon forms a large number of compounds because of its two unique properties formed many have long straight chains of carbon, branched chains of carbon or rings of carbon. In these compounds, carbon atoms may form single, double or triple covalent bonds. Compounds in which the carbon atoms are linked to each other by single bonds are

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v. What is common name and molecular formula of ethyne?



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i. Why does carbon form large number of compounds?



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Apply Your Knowledge Use Your Brain Power

1. Hydrogen peroxide decomposes on its own by the following reaction. $H - O - O - H \rightarrow 2H - O - H + O_2$

From this, what will be your inference about the strength of O-O, Covalent bond.



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2. Tell from the above example whether oxygen has catenation power or not?



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3. Inspect the molecular formulae of the members of Alkenes. Do you find any relationship in the number of carbon atoms and the number of hydrogen atoms in the molecular formulae.



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4. If the number of carbon atoms in the molecular formulae of alkenes is denoted by 'n' what will be the number of hydrogen atoms?



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5. Write down structure formulae of the first four members of the various homologous series formed by making use of the functional groups :



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6. General formula of the homologous series of alkanes is C_nH_{2n+2} . Write down the molecular formula of the 8th and

12th member using this.



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7. Draw three structural formulae having molecular formula C_5H_{12} .



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8. Give the names n-pentane, isopentane (i-pentane) and neopentane to the above three structural formulae.

(Use the same logic as used in the names of the isomeric butanes for this purpose.)



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9. Draw all possible structural formulae having molecular formula C_6H_{14} . Give names to all the isomers. Which difficulties were faced by you while naming?



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10. In the Chlorination, substitution reaction of propane, two isomeric products containing one chlorine atom are obtained. Draw their structural formula and give their IUPAC names.



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11. Explain by writing a reaction, what will happen when pieces of sodium metal are put in n-propyl alcohol.



Watch Video Solution

12. Explain by writing a reaction, what will happen when pieces of sodium metal are put in n-propyl alcohol.



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13. Answer the following questions in one word :

Which one of ethanoic acid and hydrochloric acid is stronger?



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14. Answer the following questions in one word :

Which indicator paper out of blue litmus paper and pH paper

is useful to distinguish between ethanoic acid and hydrochloric acid?



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15. When carbon dioxide is passed through lime water it turns milky. Why?



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16. Explain the reaction that would take place when a piece of sodium metal is dropped in ethanoic acid.



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17. Two test tubes contain two colourless liquids ethanol and ethanoic acid. Explain by writing reaction which chemical test you would perform to tell which substance is present in which test tube.



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18. When fat is heated with sodium hydroxide solution, soap and glycerin are formed. Which functional group might be present in fat and glycerin?



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30. Explain by writing a reaction, which product will be formed on heating n-butyl alcohol with concentrated sulphuric acid.



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Which indicator paper out of blue litmus paper and pH paper is useful to distinguish between ethanoic acid and hydrochloric acid?



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1. Apparatus: Bunsen burner, copper gauze, metal plate, etc.

Chemicals : Ethanol, acetic acid, naphthalene

Procedure: Place one of the above chemicals (3-4 drops or a pinch) on clean copper gauze at room temperature, hold it on a blue flame of the Bunsen burner and observe.

Is smoke/soot seen to form due to combustion? Hold the metal plate on the flame when the substance is undergoing combustion. Does any deposit get collected on the plate? Which colour? Repeat the same procedure using other chemicals from the above list.



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2. The proportion of carbon atoms in ethanol (C_2H_5OH) and naphthalene ($C_{10}H_8$)



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3. A mixture of pure oxygen and acetylene is burnt for welding. Can you explain why a mixture of acetylene and air is not used?



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4. Light a Bunsen burner. Open and close the air hole at the bottom of the burner by means of the movable ring around it. When do you get yellow sooty flame? When do you get blue flame?



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5. Nisha observed that the bottoms of cooking utensils were turning black in colour while the flame of her stove is yellow in colour. Her daughter suggested cleaning the air holes of the stove to get a clean, blue flame. She also told her mother that this would prevent the fuel from getting wasted.

What could be the reason for this sooty flame?



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6. Nisha observed that the bottoms of cooking utensils were turning black in colour while the flame of her stove is yellow in colour. Her daughter suggested cleaning the air holes of the stove to get a clean, blue flame. She also told her mother that this would prevent the fuel from getting wasted.

How does cleaning the air holes of the stove help in saving the fuel?



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7. Apparatus: Test tube, Bunsen burner, measuring cylinder, dropper, etc.

Chemicals : Ethanol, dilute solution to it and warm the mixture by holding the test tube on the burner for a while.

Do drop wise addition of a dilute solution of potassium permanganate to this warm mixture with stirring.

Does the typical pink colour of potassium permanganate stay as it is on addition? Does the pink colour stop vanishing and stays on after some time of the addition process?



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8. Apparatus: Test tubes, droppers, etc.

Chemicals : Tincture iodine, bromine water, liquefied vanaspati ghee, various vegetable oils (peanut, safflower, sunflower, olive, etc.)

Procedure : Take 4 mL oil in a test tube and add 4 drops of tincture iodine or bromine water in it. Shake the test tube. Find out whether the original colour of bromine or iodine disappears or not. Repeat the same procedure using other oils and vanaspati ghee.

What inference will you draw from this?



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Which of the substances do contain multiple bonds ?



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10. Apparatus: Big test tube, delivery tube fitted in a rubber cork, knife, candle, etc.

Chemicals : Sodium metal, ethanol, magnesium ribbon, etc.

Procedure : Take 10 mL ethanol in a big test tube. Cut Sodium metal into 2-3 pieces of a cereal grain size. Put the sodium

pieces into the ethanol in the test tube and fix the gas delivery tube to the test tube. Take a burning candle near the outlet of the gas delivery tube and observe.

Which is the combustible gas coming out of the gas delivery tube?



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Why do the sodium pieces appear to dance on the surface of ethanol?



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Repeat the above procedure using magnesium ribbon instead of sodium. Do you see gas bubble released from the piece of magnesium ribbon?



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Does magnesium metal react with ethanol?



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14. Apparatus : Glazed tile, glass rods, pH paper, blue litmus paper.

Chemicals : Dilute ethanoic acid, dilute hydrochloric acid

Procedure : Place two strips of blue litmus paper on a glazed tile. Put one drop of dilute hydrochloric acid on one strip with the help of a glass rod. Put one drop dilute ethanoic acid with the help of another glass rod on the other strip. Note the colour change taken place in the litmus strip. Repeat the same procedure using strips of pH paper. Note all the observation in the following table.



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15. Apparatus : Big test tube, small test tube, bent gas delivery tube, rubber cork, thistle funnel, stand, etc.

Chemicals : Acetic acid, sodium carbonate power, freshly prepared lime water.

Procedure : Arrange the apparatus as shown in figure. Place sodium carbonate power in the big test tube. Pour 10 mL acetic acid through the thistle funnel. Observe the changes taking place in the two test tubes.



Which gas comes out as effervescence in the big test tube?



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Why are bubbles seen in the small test tube.



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What is the colour change in the lime water? Write the related equation.



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18. Apparatus : Test tube, beakers, burner, etc.

Chemicals : Glacial ethanoic acid, ethanol, concentrated sulphuric acid, etc.

Procedure : Take 1 mL ethanol and 1 mL glacial ethanoic acid

in a test tube. Add a few drops of concentrated sulphuric acid in it. Keeps this test tube in the beaker containing hot water (hot water bath) for five minutes. Then take 20-30 mL water in another beaker, and pour the above reaction mixture in it and smell it.

What can you say about the smell of the reaction mixture?



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34. Apparatus : Big test tube, small test tube, bent gas delivery tube, rubber cork, thistle funnel, stand, etc.

Chemicals : Acetic acid, sodium carbonate powder, freshly prepared lime water.

Procedure : Arrange the apparatus as shown in figure. Place sodium carbonate powder in the big test tube. Pour 10 mL acetic acid through the thistle funnel. Observe the changes taking place in the two test tubes.



Why are bubbles seen in the small test tube.



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35. Apparatus : Big test tube, small test tube, bent gas delivery tube, rubber cork, thistle funnel, stand, etc.

Chemicals : Acetic acid, sodium carbonate power, freshly prepared lime water.

Procedure : Arrange the apparatus as shown in figure. Place sodium carbonate power in the big test tube. Pour 10 mL acetic acid through the thistle funnel. Observe the changes taking place in the two test tubes.



What is the colour change in the lime water? Write the related equation.



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36. Apparatus : Test tube, beakers, burner, etc.

Chemicals : Glacial ethanoic acid, ethanol, concentrated sulphuric acid, etc.

Procedure : Take 1 mL ethanol and 1 mL glacial ethanoic acid in a test tube. Add a few drops of concentrated sulphuric acid in it. Keeps this test tube in the beaker containing hot water (hot water bath) for five minutes. Then take 20-30 mL water in another beaker, and pour the above reaction mixture in it and smell it.

What can you say about the smell of the reaction mixture?



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Apply Your Knowledge Can You Tell

1. What are the chemical names of the nutrients that we get from the food stuff, namely cereals, pulses and meat?



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2. What are the chemical substances that make cloth, furniture, and elastic objects?



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3. What are the chemical names of the nutrients that we get from the food stuff, namely cereals, pulses and meat?



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4. What are the chemical substances that make cloth, furniture, and elastic objects?



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Chapter Assessment Choose The Correct Alternative

1. When ethanol reacts with sodium, a gas is evolved which _____.

- A. burns with pop sound
- B. turns lime water milky
- C. carbon compounds
- D. has a foul smell of rotten eggs

Answer: A



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2. Which of the following compounds burns with sooty flame?

A. Ethanol

B. Butane

C. Hexane

D. Naphthalene

Answer:



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3. In laboratory, a student added 3 mL ethanol and 5 mL sodium carbonate in a test tube and warmed the mixture for few minutes. He then slowly added few drops of potassium permanganate to this warm solution with constant stirring. He observed that the pink colour of potassium permanganate had disappeared. This is because _____

.

- A. ethanol is reduced to ethane
- B. ethanol is oxidized to acetic acid
- C. ethanol is reduced to methanoic acid
- D. ethanol is oxidized to acetone.

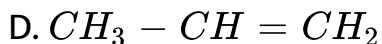
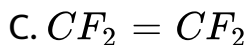
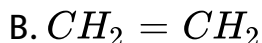
Answer:



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4. The structure of the monomer unit of Telfon is _____

.



Answer:



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5. When ethanol reacts with sodium, a gas is evolved which _____.

- A. burns with pop sound
- B. turns lime water milky
- C. CARBON COMPOUNDS
- D. has a foul smell of rotten eggs

Answer: A



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6. Which of the following compounds burns with sooty flame?

- A. Ethanol
- B. Butane
- C. Hexane
- D. Naphthalene

Answer:



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7. In laboratory, a student added 3 mL ethanol and 5 mL sodium carbonate in a test tube and warmed the mixture for few minutes. He then slowly added few drops of potassium permanganate to this warm solution with constant stirring. He observed that the pink colour of potassium permanganate had disappeared. This is because _____

.

- A. ethanol is reduced to ethane
- B. ethanol is oxidized to acetic acid
- C. ethanol is reduced to methanoic acid

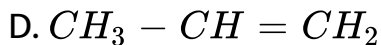
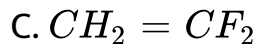
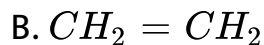
D. ethanol is oxidized to acetone.

Answer:



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8. The structure of the monomer unit of Teflon is _____ .



Answer:



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Chapter Assessment Answer The Following

1. Name the monomer of natural rubber.



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2. Complete the analogy and explain.

Ethane : _____ :: Acetylene : Unsaturated hydrocarbon.



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3. True or false. If false, write the correct sentence.

When benzene burns in air, it gives clean blue flame.



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4. What is homologous series ? Write the name and molecular formula of the 2nd member of homologous series of alkenes.



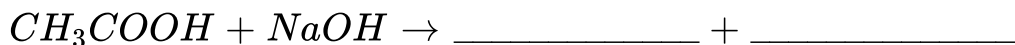
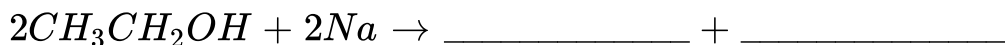
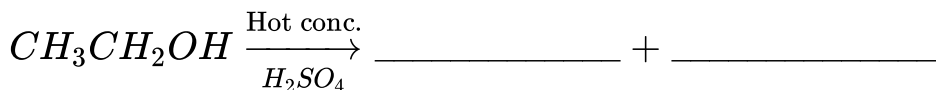
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5. Name the components of cooking gas. Write their molecular formulae.



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6. Complete the following reactions.





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7. Select the appropriate option and complete the following paragraph.

(single, double, hydrocarbons,

C_2H_4 , C_2H_6 , $CHCl_3$, CH_3Cl , methane, ethane)

Carbon compounds contain carbon and hydrogen as the only two elements are called _____. The smallest hydrocarbon is _____. Another hydrocarbon is _____ with molecular formula _____. In both these hydrocarbons, the valencies of all the atoms are satisfied by the _____ bonds. If one hydrogen atom of methane is replaced by another monovalent element chlorine, then a new carbon compounds is formed. The molecular formula of this compound is _____.



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8. Draw all possible structural formulae having molecular formula C_6H_{14} . Give names to all the isomers. Which difficulties were faced by you while naming?



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9. What is esterification reaction? Explain the preparation of an ester with the help of a neat labelled diagram.



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10. Name the monomer of natural rubber.



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11. Complete the analogy and explain.

Ethane : _____ :: Acetylene : Unsaturated hydrocarbon.



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12. True or false. If false, write the correct sentence.

When benzene burns in air, it gives clean blue flame.



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13. What is homologous series ? Write the name and molecular formula of the 2nd member of homologous series of alkenes.



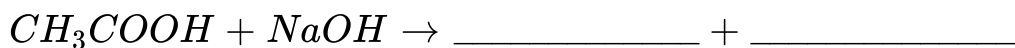
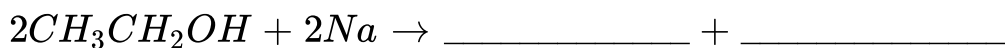
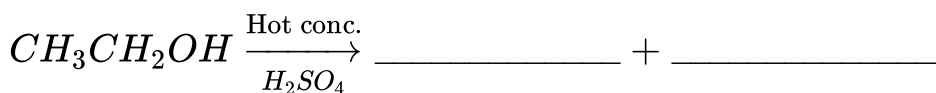
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14. Name the components of cooking gas. Write their molecular formulae.

[Watch Video Solution](#)

15. Complete the following reactions.

[Watch Video Solution](#)

16. Select the appropriate option and complete the following paragraph.

(single, double, hydrocarbons,
 C_2H_4 , C_2H_6 , $CHCl_3$, CH_3Cl , methane, ethane)

Carbon compounds contain carbon and hydrogen as the only two elements are called _____. The smallest hydrocarbon is _____. Another hydrocarbon is _____ with molecular formula _____. In both these hydrocarbons, the valencies of all the atoms are satisfied by the _____ bonds. If one hydrogen atom of methane is replaced by another monovalent element chlorine, then a new carbon compounds is formed. The molecular formula of this compound is _____.



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17. Draw all possible structural formulae having molecular formula C_6H_{14} . Give names to all the isomers. Which difficulties were faced by you while naming?



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18. What is esterification reaction? Explain the preparation of an ester with the help of a neat labelled diagram.



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Chapter Assessment Give Scientific Reasons

1. State whether the following statements are true or false. If false then rewrite the correct statements: Carbon is

tetravalent and it can undergo catenation.



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2. True or false. If false, write the correct sentence.

Propene undergoes addition reaction.



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3. True or false. If false, write the correct sentence.

Propene undergoes addition reaction.



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