11th 12th Science Notes Questions

[Tnpsc Syllabus Portion]

Hydrocarbons

1. Hydrocarbon consists of which of the following elements
   a) Carbon
   b) Hydrogen
   c) Nitrogen
   d) Both a and b

   Explanation

   Hydrocarbons are made of only carbon and hydrogen

2. Hydrocarbons are mainly obtained from
   a) Petroleum
   b) Natural gas
   c) Coal
   d) All the above

   Explanation

   Hydrocarbons are made of only carbon and hydrogen. They are obtained mainly from petroleum, natural gas and coal.

3. Which of the following is a classification of hydrocarbons?
   a) Aliphatic hydrocarbons
   b) Aromatic hydrocarbons
   c) General hydrocarbons
   d) Both a and b

   Explanation

   Hydro carbons are divided into two main categories are aliphatic hydrocarbons and aromatic hydrocarbons.

4. Aliphatic hydrocarbons are classified into
   a) Saturated hydrocarbons or alkanes
   b) Unsaturated hydrocarbons or alkenes and alkynes
   c) Alicyclic hydrocarbons
   d) All the above

   Explanation

   The aliphatic hydrocarbons are further classified into saturated (alkanes), unsaturated (alkenes and alkynes) and alicyclic (cycloalkanes) hydrocarbons.

5. Aliphatic hydrocarbons show what kind of character for chemical reaction?
   a) Chemically active

b) Chemically inert
c) Chemical less reactive
d) None of the above

Explanation

These are otherwise called alkanes. Alkanes are often referred to as paraffins. Alkanes show little chemical affinity towards other compounds and are chemically inert to most reagents.

6. What is name of the having 6 carbon atoms in it?
   a) Butane
   b) Propane
   c) Pentane
   d) Hexane

   Explanation

Number of Carbon atoms	Name	Molecular formula C_nH_{2n+2}
1	Methane	CH_4
2	Ethane	C_2H_6
3	Propane	C_3H_8
4	Butane	C_4H_{10}
5	Pentane	C_5H_{12}
6	Hexane	C_6H_{14}

7. Molecular formula of alkanes is
   a) Cn H2n
   b) Cn H2n-2
   c) **Cn H2n+2**
   d) None of the above

   Explanation

   Cn H2n+2 is the molecular formula of alkanes

8. Identify the steps in naming of alkanes according with IUPAC nomenclature
   a) Find the longest continuous carbon chain present in the molecule and use the name of that chain as the parent name.
   b) Beginning either from the left or from the right nearer the first branch point, give the number to each carbon atom in the longest chain, you have identified
   c) Using the correct numbering system, assign a number to each substituent according to its point of attachment to the main chain
   d) Final naming
   e) All the above

   Explanation

   All the above are the steps in naming alkanes as per IUPAC nomenclature.

9. The major sources of alkanes are natural gas and petroleum deposits are derived from
   a) Decomposition of plants and animals
   b) Decompose of marine organic matter
   c) Both a and b
   d) None of the above

   Explanation

   The major sources of alkanes are natural gas and petroleum deposits, which are derived from the decomposition of marine organic matter.

10. Which of the following is highly complex mixture of hydrocarbons?
   a) Natural gas
   b) Petroleum
   c) Fossils
   d) None of the above

   Explanation

   Petroleum is a highly complex mixture of hydrocarbons that must be refined into different fractions to get various lower member hydrocarbons.

11. In cracking, the alkanes are passed through a heated chamber of
   a) 200-300 C
   b) 500-1000C
   c) **400-600C**
   d) None of the above

   Explanation

   When higher alkanes are passed through a chamber heated to 400- 600°C in the presence of a catalyst (metallic oxides), the products are alkanes with less number of the carbon atoms and this is known as cracking.

12. Select the correct answers regarding preparation methods of alkanes
   1. By catalytic reduction of alkenes
   2. Wurtz reaction
   3. From Grignard reagents
   4. By decarboxylation of carboxylic acids
   5. Kolbe's electrolytic method
   6. From alcohols

   a) 1,2,3 are correct
   b) 2 only correct
   c) All the above are correct
   d) 1,2,3 and 4 are correct

   Explanation

The above mentioned are the preparation methods of alkanes.

13. Alkenes are called as olefins, in the same way , alkanes are known as
    a) Oily olefins
    b) Parafins
    c) Ketafins
    d) All the above

    Explanation

    Alkenes are called as olefins, in the same way , alkanes are known as parafins.

14. Many alkenes (olefins) may be reduced by passing their vapours with hydrogen over finely divided nickel supported on Kieselguhr at 200-300°C. This reaction is referred to as the
    a) Sabatier-Senderens reduction.
    b) Reduction
    c) Oxidation
    d) None of the above

    Explanation

    Many alkenes (olefins) may be reduced by passing their vapours with hydrogen over finely divided nickel supported on Kieselguhr at 200-300°C. This reaction is referred to as the Sabatier-Senderens reduction.

15. The following nickel is more active than finely divided ones
    a) Nichrome
    b) Raney nickel
    c) Gunpowder
    d) All the above

    Explanation

    Finely divided nickel may be replaced by Raney nickel introduced by Raney (1927). It is more active than finely divided nickel. It is active even at room temperature.

16. _____are hydrogenated to Vanaspathi ghee with nickel catalyst at 300°C.
    a) saturated edible oils
    b) **Unsaturated edible oils**
    c) Both a and b
    d) None of the above

    Explanation

    Unsaturated edible oils are hydrogenated to Vanaspathi ghee with nickel catalyst at 300°C.

17. The alkanes which are obtained by **Wurtz reaction** are

a) Simple alkanes
b) Mixed alkanes
c) Both a and b
d) None of the above

Explanation

An ethereal solution of an alkyl halide is treated with sodium to obtain an alkane.
$CH_3CH_2Br + 2Na + BrCH_2CH_3 \rightarrow CH_3(CH_2)_2 CH_3 + 2NaBr$
The reaction can be applied to mixed alkyl halides. The products are mixed alkanes.

18. Which of the following is known as Grignard reagents?
a) Alkyl potassium halides
b) Alkyl calcium halides
c) Alkyl magnesium halides
d) None of the above

Explanation

Alkyl magnesium halides (RMgX, X = halogen) are known as Grignard reagents.

19. Grignard reagents react with _____acids to give alkanes.
a) Water
b) Dil. acids
c) Both a and b
d) None of the above

Explanation

Alkyl halides (chloride, bromide or iodide) react with magnesium in dry ether to give Grignard reagents. Grignard reagents react with water or dilute acids to give alkanes.

20. What salt is used in decarboxylation method of producing alkanes
a) Potassium salt of carboxylic acid
b) Sodium salt of carboxylic acid
c) All salts of carboxylic acid can be used
d) None of the above

Explanation

When sodium salts of carboxylic acids are heated with soda lime, alkanes are obtained.

21. Soda lime is a mixture of
a) NaOH
b) CaO
c) Both a and b
d) None of the above

Explanation

Sodalime is a 3:1 mixture of NaOH and CaO. The role of CaO is to fuse sodium hydroxide.

22. In Kolbe's electrolytic method which of the following salt is electrolysed?
a) Sodium salt
b) Potassium salt
c) Both a and b
d) None of the above

Explanation

When a concentrated solution of sodium or potassium salt of carboxylic acid is electrolysed, a higher homologue of the alkane series is obtained.

23. On heating alcohol with the following element with alcohol alkanes are produced
a) Hydrochloric acid
b) Hydroiodic acid
c) Sulphuric acid
d) None of the above

Explanation

Alcohols on heating with concentrated hydroiodic acid and red phosphorous at 150°C under pressure in a sealed tube get reduced to alkanes.

24. The dipole moment of the alkanes is
a) Zero
b) One
c) Four
d) Eight

Explanation

The dipole moment of all alkanes, whether straight or branched-chain is zero. Hence the alkanes have very weak force of attraction.

25. Alkanes have what kind of force in between them
a) Electrostatic force
b) Vander waal's force
c) Both a and b
d) None of the above

Explanation

The dipole moment of all alkanes, whether straight or branched-chain is zero. Hence the alkanes have very weak force of attraction (Vanderwaals forces) between them.

26. The Vanderwaal's force in n-alkanes is
a) Small

b) Large
c) Normal
d) None of the above

Explanation

The Vanderwaals force increases with increase in the area of contact. Hence in the n-alkanes, owing to their large surface area due to their linear structure, the Vanderwaals force is large.

27. The vander waal's force in branched alkanes is

a) Small
b) Large
c) Normal
d) None of the above

Explanation

In the branched alkanes the molecules tend to become spherical hence they have less surface area and contact, and less Vanderwaals force.

28. The hydrocarbons between C1-C4 are

a) Liquids
b) Solids
c) Gas
d) None of the above

Explanation

In the branched alkanes the molecules tend to become spherical hence they have less surface area and contact, and less Vanderwaals force. As a consequence these, C1-C4 hydrocarbons are gases.

29. The hydrocarbons between C5-C17 are

a) Solids
b) Liquids
c) Gases
d) All the above

Explanation

In the branched alkanes the molecules tend to become spherical hence they have less surface area and contact, and less Vanderwaals force. As a consequence these, C1-C4 hydrocarbons are gases, C5 - C17 liquids.

30. The hydrocarbons above C18 onwards are

a) Solids
b) Liquids
c) Gases

d) None of the above

Explanation

In the branched alkanes the molecules tend to become spherical hence they have less surface area and contact, and less Vanderwaals force. As a consequence these, C1-C4 hydrocarbons are gases, C5 - C17 liquids, and from C18 onwards are solids.

31. Properties of alkanes such as boiling point, melting point etc., _____with increase in chain length of compounds

a) Increase
b) Decrease
c) Remains same
d) None of the above

Explanation

The boiling points rise fairly regularly as the number of carbon atoms in the compound increases. Other physical properties such as melting point, density, viscosity etc., also changes, as the chain length of the compound increases.

32. What is the boiling point of butane and 2-methyl propane

a) 0C and -120C
b) 120C and 0C
c) -120C and 20 C
d) None of the above

Explanation

The boiling point of butane (0°C) is more than 2-methyl propane(- 120.0°C).

33. The melting point of n-pentane and neopentane are

a) -129.7C and -17C
b) 129.7C and 17C
c) -129.7C and -20C
d) -139.7C and -17C

Explanation

The melting point of n-pentane (-129.7°C) is less than neopentane (- 17°C

34. The melting point of alkanes depends mostly mostly on

a) Packing of molecules in crystal lattice
b) Molecular size
c) Both a and b
d) None of the above

Explanation

The melting point of alkanes depends on the packing of the molecules in the crystal lattice. Packing in turn depends on molecular size. As neopentane is spherical in shape

it will be better packed in the crystal lattice than n-butane. Hence the melting point of n-butane is less than neopentane.

35. Which of the following alkane is soluble in water
   a) Methane
   b) Ethane
   c) Propane
   d) All the above

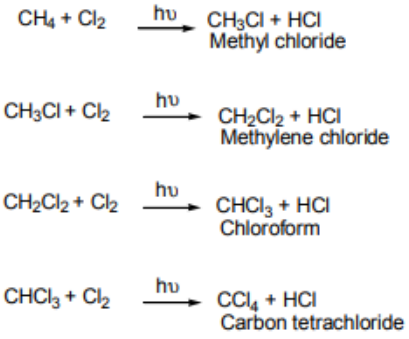
   Explanation

   All of them are colourless. Methane is soluble in water, but others are insoluble. Solubility of methane is due to its small molecular size. Due to its small size it can easily diffuse and dissolve in water.

36. Chlorination and bromination of alkanes may be brought about by
   a) Heat
   b) Light
   c) Catalyst
   d) All the above

   Explanation

   chlorination and bromination of alkanes may be brought about by light, heat or catalysts. In the presence of ultraviolet light or at high temperature all the four hydrogen atoms of CH4 may be substituted.



37. The reaction that is used to separate iodide product from NaClis known as
   a) Finkelstein or ConantFinkelstein reaction
   b) Reduction
   c) Redox reaction
   d) None of the above

   Explanation

   Iodides are prepared by treating the chloro- or bromoderivative with sodium iodide in methanol or acetone.It is easy to separate the product from NaCl as the later is insoluble in methanol or acetone. This reaction is known as the Finkelstein or ConantFinkelstein reaction.

38. The great reactivity of fluorineis due to
    a) High dissociation energy
    b) Low dissociation energy
    c) Mechanical energy
    d) None of the above

    Explanation

    Direct fluorination is usually explosive in nature. The great reactivity of fluorine is due to its low dissociation energy (150.6 kJ 1/mol)

39. Fluorine reaction is always an
    a) **Exothermic reaction**
    b) Endothermic reaction
    c) Both a and b
    d) None of the above

    Explanation

    Fluorine reaction is very strongly exothermic (447.7 kJ). The energy liberated is larger than that required to break a C-C single bond (347.3 kJ), thereby resulting in the fragmentation of the organic molecule.

40. Nitration is carried out between
    a) 150C and 450C
    b) 150C and 475C
    c) 125C and 350C
    d) None of the above

    Explanation

    Nitration of alkanes is carried out between 150 and 475°C, and the reaction yields a complex mixture of products. The reaction may be of free radical type.

41. Alkanes readily burn in excess air to form
    a) Carbon dioxide
    b) Water
    c) Carbon monoxide
    d) Both a and b

    Explanation

    Alkanes readily burn in excess air to form CO_2 and H_2O.

    $CH_4 + 2O_2 \rightarrow CO_2 + H_2O$

42. Which of the following is used in the manufacturing of ink and black pigments?
    a) Graphite

b) Lead
c) Carbon black
d) All the above

Explanation

At controlled oxygen supply methane forms carbon black used in the manufacturing of ink and black pigments. It is also used as fillers.

43. N-Alkanes can be isomerized into branched chain alkanes when heated with _____at 300C
a) Anhydrous aluminium chloride
b) Hydrogen chloride
c) Both a and b
d) None of the above

Explanation

n-Alkanes can be isomerized into branched chain alkanes when heated with anhydrous aluminium chloride and hydrogen chloride at 300°C. The presence of an alkene impurity is shown to be important to initiate isomerization.

44. When alkanes with six or more carbon atoms are passed over hot alumina supported_____ dehydrogenative cyclization to yield aromatic compounds occurs.
a) Chromium oxide
b) Vanadium oxide
c) Molybdenum oxide
d) All the above

Explanation

When alkanes with six or more carbon atoms are passed over hot alumina supported chromium, vanadium or molybdenum oxide, dehydrogenative cyclization to yield aromatic compounds occurs. Cr_2O_3 is the catalyst, and Al_2O_3 merely disposes Cr_2O_3 on it.

45. Which of the following hydrocarbon has carbon carbon double bond as a functional group?
a) Alkanes
b) Alkenes
c) Alkynes
d) All the above

Explanation

Alkenes are hydrocarbons that contain carbon-carbon double bond as functional group. They are otherwise known as olefins. Alkenes occur abundantly in nature

46. If the structural formula is $CH_2 = CH_2$,then its molecular formula and common name is

a) C2H4 and ethylene
b) C6H6 and propylene
c) C2H2 and butylene
d) None of the above

Explanation

Molecular formula	Structural formula	Common name	IUPAC name
C_2H_4	$CH_2 = CH_2$	Ethylene	Ethene
C_3H_6	$CH_3 - CH = CH_2$	Propylene	Propene
C_4H_8	CH_3-CH_2-$CH = CH_2$	Butylene	1 - Butene

47. If a elements common name is butylene and its molecular formula is C_4H_8, then its IUPAC name is
a) 2-butene
b) 1-butylene
c) 3-butene
d) 1-butene

Explanation

Molecular formula	Structural formula	Common name	IUPAC name
C_2H_4	$CH_2 = CH_2$	Ethylene	Ethene
C_3H_6	$CH_3 - CH = CH_2$	Propylene	Propene
C_4H_8	CH_3-CH_2-$CH = CH_2$	Butylene	1 - Butene

48. Find out the steps in naming the alkenes
a) Name the parent hydrocarbon
b) Number the carbon atoms in the chain beginning from the end which is nearer the double bond
c) If more than one double bond is present, indicate the position of each double bond and use the suffices as -diene, -triene, -tetrene etc.
d) All the above

Explanation

The above mentioned are the steps involved in naming of alkene

49. Which of the following is not a method of preparation of alkenes
a) By dehydration of alcohols
b) By pyrolysis of esters
c) Dehydrohalogenation of alkyl halides
d) None of the above

Explanation

The methods are
1. By dehydration of alcohols

2. By pyrolysis of esters
3. Dehydrohalogenation of alkyl halides
4. Hydrogenation of alkynes
5. By electrolysis of salts of dicarboxylic acids
6. Dehalogenation of vicinal halides

50. The olefins with two to five carbon are
a) Liquids
b) Gases
c) Solids
d) None of the above

Explanation

The olefins with two to four carbon atoms are gases; five to seventeen liquids, eighteen on wards solids at room temperature and they burn in air with luminous smoky flame.

51. Which of the following element show isomerism?
a) Ethene
b) Propene
c) Butane
d) All the above

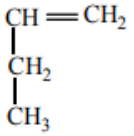
Explanation

Position isomerism : It arises due to position of the double bond in a molecule. Ethene and propene do not show position isomerism, but butene shows

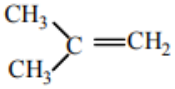
52. Chain isomerism in alkene is due to
a) Branching of linear chain
b) Presence of triple bond
c) Both a and b
d) None of the above

Explanation

Chain isomerism is due to branching of the linear chain .



But-1-ene



2-Methyl propene-1

53. When two isomers differ in their spatial arrangement of atoms or groups, they are said to be
a) Mono isomer

b) Tri isomer
c) Stereoisomers
d) None of the above

Explanation

When two isomers differ in their spatial arrangement of atoms or groups, they are said to be stereoisomers. This type of isomerism is called stereoisomerism

54. Mention the types of stereoisomerism.
a) Optical isomerism
b) Geometrical isomerism
c) Spatial isomerism
d) Only a andb

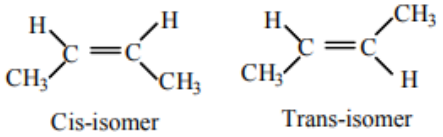
Explanation

When two isomers differ in their spatial arrangement of atoms or groups, they are said to be stereoisomers. This type of isomerism is called stereoisomerism. Types of stereoisomerism are Optical isomerism and Geometrical isomerism.

55. Geometrical isomers are named as _____compounds depending on whether the identical groups are on the same or opposite sides of the bonds.
a) Cis isomer
b) Trans isomer
c) Both a and b
d) None of the above

Explanation

Geometrical isomers are named as cis and trans compounds depending on whether the identical groups are on the same or opposite sides of the bonds.



Cis-isomer Trans-isomer

56. The isomer designated as Z, which is Zusammen in german means
a) Together
b) Opposite
c) Variable
d) None of the above

Explanation

When the two groups or atoms of highest priority are on the same side of the double bond, the isomer is designated as Z (Zusammen in German means together).

57. The isomer designated as E , which is Entegen in german means

a) Same
b) Opposite
c) Variable
d) None of the above

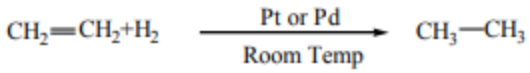
Explanation

When the two groups or atoms of highest priority are on the same side of the double bond, the isomer is designated as Z (Zusammen in German means together), and when they are on the opposite sides, the isomer is designated as E (Entegen in German meaning opposite).

58. Alkenes can be readily hydrogenated under pressure in the presence of
a) Heat
b) Light
c) Catalyst
d) All the above

Explanation

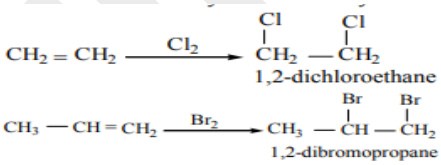
Alkenes can be readily hydrogenated under pressure in the presence of a catalyst.



59. Bromine and chlorine add readily to alkenes to yield
a) Haloalkanes
b) Dihaloalkanes
c) Trihaloalkanes
d) None of the above

Explanation

Bromine and chlorine add readily to alkenes to yield dihaloalkanes. In this reaction bromine will be decolourised and this test is used to detect unsaturation.



60. Propylene on hydrohalogenation can yield the following
a) N-propyl iodide
b) Isopropyl iodide
c) Both a and b
d) None of the above

Explanation

Propylene can yield two possible products namely n-propyl iodide or isopropyl iodide with HI, depending upon the orientation of addition. Actually it is found that isopropyl iodide is the only product obtained.

61. Isobutylene can yield some products on hydrohalogenation, what are they?
a) Isobutyl iodide
b) Tertiary butyl iodide
c) Both a and b
d) None of the above

Explanation

In the same way, isobutylene can yield either of the two products, isobutyl iodide or tertiary butyl iodide. Here the orientation or addition is such that the tertiary butyl iodide is the only product.

62. The negative part of addendum attaches itself to the carbon atom carrying less number of hydrogen atoms , this rule is known as
a) Octet rule
b) Vladmir rule
c) Markovnikov's rule
d) None of the above

Explanation

The Russian chemist Vladimir Markovnikov, explained the reason which is known as Markovnikov's rule, which states that, the negative part of addendum attaches itself to the carbon atom carrying less number of hydrogen atoms.

63. Select the correct form of order of stability of carbocations
a) 1'carbocation>2' carbocation>3' carbocation
b) 2' carbocation>3' carbocation>1' carbocation
c) 3' carbocation>2' carbocation>1' carbocation
d) None of the above

Explanation

Carbocations are involved as intermediates in these reactions. Highly substituted carbocation is formed as an intermediate in preference to the less substituted one due to stability.

Order of stability

3° carbocation > 2° carbocation > 1° carbocation]

64. Electrophilic addition does not take place in presence of
a) Oxide
b) Light
c) Catalyst

d) Peroxide

Explanation

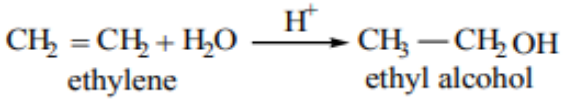
In the presence of peroxides the electrophilic addition does not take place and the addition takes place through free radical mechanism.

65. What happens when water is added to simple alknaes

a) Aldehyde are formed
b) Alcohol is formed
c) No change
d) None of the above

Explanation

Water can be added to simple alkenes to yield alcohols. This hydration reaction takes place on treatment of the alkene with water in presence of a strong acid-catalyst.



66. Alkenes can add HOCl or HOBr under suitable conditions to yield

a) 1,2 haloalcohols
b) Halohydrins
c) Both a and b are same
d) None of the above

Explanation

Alkenes can add HOCl or HOBr under suitable conditions to yield 1,2 haloalcohols or halohydrins. Halohydrin formation does not take place by direct reaction of an alkene with the reagents (HOCl or HOBr). But the addition is done indirectly by the reaction of the alkene with either Br2 or Cl2 in presence of water.

67. What is the end product of ozonolysis of alkene

a) Ozonide
b) Carbonyl compounds
c) Carboxylic acid
d) Both a and c

Explanation

Ozone is the most useful double bond cleavage reagent. When added to an alkene first an ozonide intermediate is formed. When the ozonide is further treated with a reducing agent such as zinc metal in acetic acid, it is converted into carbonyl compounds.

68. Which of the following is called baeyer's reagent?

a) Calcium phosphate

b) Potassium permanganate
c) Both a and b
d) None of the above

Explanation

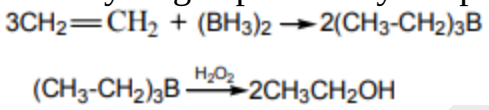
The addition of an -OH group to each of the two alkene carbons can be carried out with alkaline potassium permanganate. This reagent is known as Baeyer's reagent.

69. Alkenes readily react with diborane to form trialkyl boranes which on oxidation with alkaline hydrogen peroxide yield

a) Primary alcohol
b) Secondary alcohol
c) Tertiary alcohol
d) None of the above

Explanation

Alkenes readily react with diborane to form trialkyl boranes which on oxidation with alkaline hydrogen peroxide yield primary alcohols. This is known as hydroboration.



70. When ethylene is mixed with oxygen, under pressure passed over at_____, epoxide is obtained.

a) 200-300C
b) 200-400C
c) 500-550C
d) 10-15C

Explanation

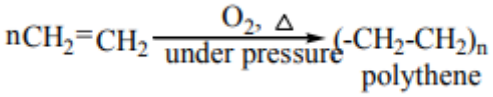
When ethylene is mixed with oxygen, under pressure passed over at 200 - 400°C, epoxide is obtained. This is called as Epoxidation.

71. What is the chemical formula of polythene or polyethylene?

a) (-CH2-CH2)n
b) (-CH4-CH3)n
c) (-CH3-CH2)n
d) (-CH2-CH3)n

Explanation

When ethylene is heated under pressure in presence of oxygen, a compound of high molar mass known as polyethylene or polythene is formed.



72. Which of the following is not used for fruit ripening?
a) Ethylene
b) Ethyl alcohol
c) Methylated spirit
d) Both b and c

Explanation

Ethylene is used for ripening of fruits.

73. Consider the following and choose the correct
i) Ethylene is used to prepare industrial solvents like ethylene dichloride
ii) Ethylene is used to prepare industrial solvents like glycol, dioxan etc.,
a) I only
b) II only
c) Both are wrong
d) Both I and II

Explanation

Ethylene is used to prepare industrial solvents like ethylene dichloride, glycol, dioxan etc.,

74. Which of the following is/are industrial organic chemicals
a) Ethylene
b) Propylene
c) Both a and b
d) None of the above

Explanation

Ethylene and propylene are important industrial organic chemicals. They are used in the synthesis of polymers like polythene, polypropylene, pvc, polystyrene, teflon, orlon, acrilan, polyvinyl acetate, polyvinyl alcohol etc.,

75. Using propylene and ethylene which of the following are produced
a) Polythene
b) Polypropylene
c) Teflon
d) All the above

Explanation

Ethylene and propylene are important industrial organic chemicals. They are used in the synthesis of polymers like polythene, polypropylene, pvc, polystyrene, teflon, orlon, acrilan, polyvinyl acetate, polyvinyl alcohol etc.,

76._____is used in the preparation of a synthetic rubber called Thiokol
a) Ethylene chloride

b) Ethylene dichloride
c) Ethyl alcohol
d) Dimethyl ether

Explanation

Ethylene dichloride which is prepared from ethylene is used in the preparation of a synthetic rubber called thiokol.

77. Consider the following and select the correct regarding the test for ethylene

i) Rapid decolourisation of bromine in carbontetrabromide without evolution of hydrogen bromide
ii) Colourisation of cold dilute aqueous potassium permanganate solution.

a) **I only**
b) II only
c) I and II are correct
d) None of the above

Explanation

i) Rapid decolourisation of bromine in carbontetrabromide without evolution of hydrogen bromide
ii) Decolourisation of cold dilute aqueous potassium permanganate.

78. If a hydrocarbon contains two double bonds it is called as

a) Diolefin
b) Alkadiene
c) **Both a and b**
d) None of the above

Explanation

If a hydrocarbon contains two double bonds it is called diolefin or alkadiene.

79. The general formula of Alkadiene is

a) CnH2n-4
b) CnH2n-3
c) CnH2n-1
d) CnH2n-2

Explanation

Alkadienes have general formula CnH2n-4

80. Butadiene is used in manufacture of

a) Buna rubber
b) Buna plastic
c) Buna catalyst
d) None of the above

Explanation
Butadiene is used in the manufacture of Buna rubber.

81. Which of the following is called as acetylene
a) Alkanes
b) Alkenes
c) Alkadienes
d) Alkynes
Explanation
Alkynes are also called acetylenes, the first and the most important member of this series is acetylene and hence these are called acetylenes.

82. Alkanes have what kind of bond
a) Carbon carbon triple bond
b) Carbon carbon double bond
c) Carbon carbon single bond
d) None of the above
Explanation
Alkynes are also called acetylenes. They are hydrocarbons that contain a carbon-carbon triple bond. The first and the most important member of this series is acetylene and hence these are called acetylenes.

83. If common name is dimethyl acetylene, then its IUPAC name is
a) 1-butyne
b) 2-butyne
c) 2-methyl 2-ethylene
d) Both a and b
Explanation

Structural formula	Common name	IUPAC name
$CH \equiv CH$	acetylene	ethylene
$^{3}CH_3{}^{2}C \equiv {}^{1}CH$	methyl acetylene	1-propyne
$^{4}CH_3{}^{3}CH_2{}^{2}C{\equiv}{}^{1}CH$	ethyl acetylene	1-butyne
$CH_3 - C \equiv C - CH_3$	dimethyl acetylene	2-butyne

84. Find out the methods of preparation of alkynes.
a) Dehydrohalogenation of vicinal dihalides
b) Dehalogenation of tetrahalides
c) Both a and b

d) None of the above

Explanation

Dehydrohalogenation of vicinal dihalides and Dehalogenation of tetrahalides are the methods of preparation of alkynes.

85. Compounds that contain halogen atoms on adjacent carbon atoms are called as

a) Vicinal halides

b) Vicinal dihalides

c) Both a and b

d) None of the above

Explanation

Compounds that contain halogen atoms on adjacent carbon atoms are called vicinal dihalides in dehydrohalogenation.

86. When 1,1,2,2-tetrahalide is heated with zinc dust in alcohol, what is formed?

a) Alkenes

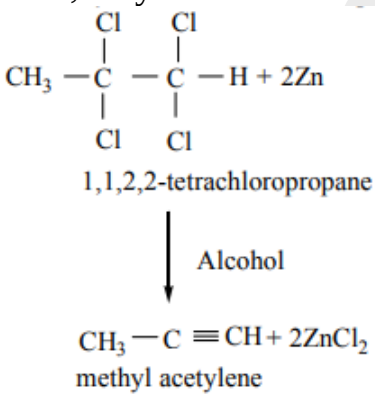
b) Alkynes

c) Alkanes

d) None of the above

Explanation

Dehalogenation of tetrahalides : When 1,1,2,2-tetrahalide is heated with zinc dust in alcohol, alkyne is formed



87. The physical properties of alkanes are same as those of

a) Alkanes

b) Alkenes

c) Both a and b

d) None of the above

Explanation

Alkynes have physical properties that are essentially the same as those of alkanes and alkenes.

88. Alkynes are soluble in
    a) Benzene
    b) Carbon tetrachloride
    c) Ether
    d) All the above

    Explanation

    Alkynes are insoluble in water but quite soluble in organic solvents like benzene, carbon tetrachloride, ether etc. They are less dense than water.

89. Boiling points and melting points of alkynes show a regular increase with increasing
    a) Number of bonds
    b) Carbon number
    c) Both a and b
    d) None of the above

    Explanation

    Alkanes boiling points and melting points show a regular increase with increasing carbon number and the usual effects of chain branching are also observed.

90. We know alkynes have triple bond, what are the type of bond it has?
    a) Strong carbon-carbon sigma bond
    b) Weak carbon-carbon pi bond
    c) Both a and b
    d) None of the above

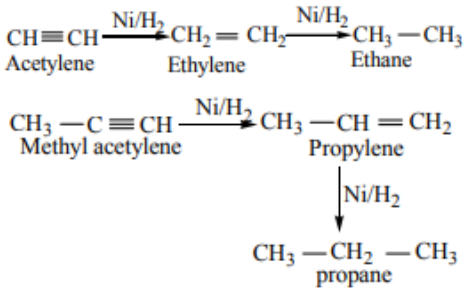
    Explanation

    Alkynes contain carbon-carbon triple bond. One of them is strong carbon carbon sigma bond and two weak carbon carbon pi bond.

91. By the addition of which of the following the alkynes are converted in to alkanes in presence of metal catalyst like nickel, palladium or platinum.
    a) Nitrogen
    b) Helium
    c) Hydrogen
    d) Boron

    Explanation

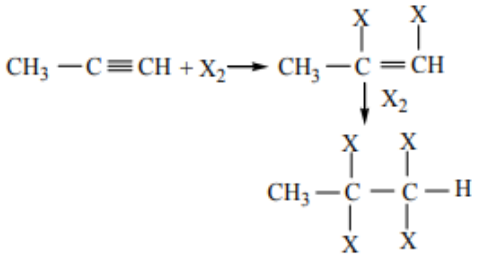
    Alkynes are easily converted to alkanes by addition of hydrogen in the presence of metal catalyst like nickel, platinum or palladium



92. The addition of halogens with alkynes forms
    a) Dihalides
    b) Trihalides
    c) Tetrahalides
    d) Both a and c

    Explanation

    Two molecules of halogens add to alkynes in two steps forming dihalides and then tetrahalides.



93. The addition of halogen acids with alkynes is similar to as that of alkenes based on which rule
    a) Markonikov's rule
    b) Octet rule
    c) Both a and b
    d) None of the above

    Explanation

    Halogen acids add to alkynes in the same way as in alkenes and give the expected addition product. Halogen acids add to symmetrical alkynes in two stages. After one molecule of the acid is added to a symmetrical alkyne, the product is an unsymmetrical derivative of alkene. The addition of a second molecule of the acid takes place in accordance with Markonikov's rule.

94. Which of the addition with C2H2 may explode and is prevented by using a metal chloride catalyst.
    a) Bromine
    b) Chlorine

c) Fluorine
d) All the above

Explanation

Direct combination of C2H2 with chlorine may explode and this is prevented by using a metal chloride catalyst.

95. When dil.sulphuric acid is added with alkyne what will be the end product?
a) Aldehyde
b) Ketone
c) Acetelyne
d) Both a and b

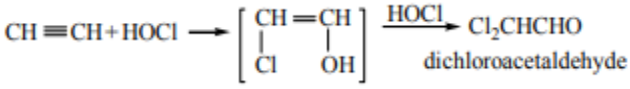
Explanation

When alkynes are passed into dilute sulphuric acid in presence of mercuric sulphate as catalyst at 60°C one molecule of water is added to the alkyne resulting in the formation of either an aldehyde or a ketone.

96. When acetylene is passed into _____acid solution, dichloroacetaldehyde is formed.
a) Hydrochloric acid
b) Hypochlorous
c) Sulphuric acid
d) All the above

Explanation

When acetylene is passed into hypochlorous acid solution, dichloroacetaldehyde is formed.



97. When Alkynes react with ozone to give ozonides. These ozonides get decomposed with water to yield diketones. Which of the alkynes is an exception to this
a) Acetylene
b) Dimethyl acetylene
c) Methyl acetylene
d) None of the above

Explanation

Alkynes react with ozone to give ozonides. These ozonides get decomposed with water to yield diketones. Diketones are oxidised to acids by hydrogen peroxide produced in the reaction. Acetylene is an exception as it gives both glyoxal and formic acid with ozone.

98. Which of the following alkynes are weakly acidic

a) All
b) Alkenes at the top
c) Terminal alkynes
d) None of the above

Explanation

The most striking difference between alkenes and alkynes is that terminal alkynes are weakly acidic. In alkyenes sp hybridization is taking place in carbon atoms and so they exhibit. 50% s character.

99. When acetylene is passed into ammoniacal silver nitrate solution silver acetylide _____is precipitated respectively.

a) Brown
b) Red
c) White
d) None

Explanation

When acetylene is passed into ammoniacal silver nitrate solution silver acetylide (white) is precipitated respectively.

100. Dry copper and silver acetylides can be decomposed by _____to regenerate alkynes.

a) Sulphuric acid
b) Nitric acid
c) Hydrochloric acid
d) None of the above

Explanation

Dry copper and silver acetylides are very sensitive to shock and may explode violently. However, they can be decomposed by nitric acid to regenerate alkynes. This type of reaction is possible with only terminal alkynes. Non-terminal alkynes will not give this reaction.

101. By which of the following process acetylene is converted to mesitylene

a) Hydrogenation
b) Halogenation
c) Polymerization
d) All the above

Explanation

When alkynes are passed through red hot iron tube under pressure they polymerise to aromatic compounds. For example acetylene polymerises to benzene and propylene polymerises to mesitylene.

102. Consider the following statements and find the correct regarding tests of alkene
   a) Acetylene decolourises bromine water
   b) Acetylene decolourises alkaline potassium permanganate solution
   c) With ammoniacal solution of cuprous chloride it gives a red precipitate of cuprous acetylide
   d) All the above

   Explanation

   Above mentioned are tests of alkynes

103. Which of the following is used to manufacture acetaldehyde, acetone, benzene?
   a) Alkanes
   b) Alkenes
   c) Alkynes
   d) None of the above

   Explanation

   Acetylene is used as a starting material for manufacture of industrially important compounds like acetaldehyde, acetone and benzene.

104. Following is used as torch in welding and cutting metals
   a) Acetylene
   b) Ethyl methyl acetylene
   c) Dimethyl ether
   d) All the above

   Explanation

   Acetylene is used in oxyacetylene torch used for welding and cutting metals.

105. Which of the following is used as starting material in manufacture of PVC, polyvinyl acetate, synthetic rubber?
   a) Ether
   b) Ethyl alcohol
   c) Acetylene
   d) Both a and b

   Explanation

   Acetylene is used as a starting material for the manufacture of PVC, polyvinyl acetate and synthetic rubber.

106. A solvent which is tetrachloro derivative of acetylene is prepared from acetylene it is
   a) Westron

b) Phenol
c) Acid
d) None

Explanation

Westron, a solvent which is tetrachloro derivative of acetylene is prepared from acetylene.