

IITJEE Foundation Practice paper

CARBON AND ITS COMPOUNDS

class-10th-Science Number of Questions: 100

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1

A dilute solution of ethanoic acid in water is called

- Tincture iodine Absolute alcohol Vinegar Acetic acid

2

Ethanoic acid is commonly known as

- Acetylene Ethane Carboxylic acid Acetic acid

3

What property of carbon allows it to form a large number of carbon compounds?

- Tetra valency Catenation Electro negativity Electro positivity

4

The IUPAC name of C_2H_2 is

- Ethylene Ethene Ethyne Ethane

5

The portion left on dropping a hydrogen from an alkane is called

- Functional group Alkenyl group Alkyl group Alkynyl group

6

The general formula of alkanes is

- C_nH_{2n} C_nH_{2n-2} C_nH_{2n+2} C_nH_{2n+1}

7

Which of the following is alkane?

- C_4H_{10} C_4H_8 C_4H_6 C_6H_6

8

The functional group present in carboxylic acid is

- OH -CHO -COOH -CO

9

C_{60} has arranged by x pentagons and y hexagons. The values of x and y are

- 20, 12 12, 20 21, 20 12, 10

10

Catenation means

- Ability to exhibit tetra valency Isotopy Allotropy Self-linkage

11

Root word for six carbon atoms is

- Hept Sept Oct Hex

12

Which of the following contains a double bond?

- C_2H_6 C_2H_4 C_2H_2 C_4H_{10}

13

An alkane has a molecular formula C_nH_{14} . Then the value of 'n' is

- 5 8 6 4

14

Pick out a set of homologues

- $C_2H_6, C_2H_4, C_2H_2, C_2H_5$ $C_6H_6, C_9H_8, C_9H_{10}, C_9H_{14}$
 $CH_4, C_2H_6, C_3H_8, C_4H_{10}$ $C_2H_2, CH_4, C_4H_6, C_4H_{10}$

15

The metal used as a catalyst for the hydrogenation of unsaturated hydrocarbon is

- Fe Ni V Zn

16

The hybridization of carbon in diamond is

- sp sp^2 sp^3 sp^3d

17

Two members of homologous series have

- different general formula different molecular masses
 different methods of preparation different chemical property

18

The hybridization of carbon in graphite is

- sp sp^2 sp^3 sp^3d

19

The number of –OH groups present in glycerol is

- 2 3 4 1

20

The formula of stearic acid is

- $C_{15}H_{31}COOH$ $C_{17}H_{33}COOH$ $C_{17}H_{35}COOH$ $C_{17}H_{36}COOH$

21

Chemically similar compounds having the same functional group but differing by a $-CH_2$ group in their molecular formula are known as

- Isomers Homologues Allotropes Polymers

22

The suffix used for naming an aldehyde is

- $-ol$ $-al$ $-one$ $-ene$

23

Which of the following is a good conductor of electricity?

- Charcoal Diamond Graphite Coal

24

The IUPAC name of acetylene is

- Ethane Ethene Ethyne Ethylene

25

Diamond and graphite are

- Isomers Allotropes Homologous Metals

26

Hydro carbons containing only single bonds between carbon atoms are called

- Alkenes Alkanes Alkynes Alkanones

27

The process of conversion of starches and sugars to Ethanol is called

- Oxidation Reduction Fermentation Distillation

28

The percentage of Ethanol in absolute alcohol is

- 50% 60% 90% 100%

29

Among the following, the substance that undergoes substitution reaction is

- C_4H_8 C_3H_4 C_4H_{10} C_4H_6

30

The formula of soap is

- $C_{17}H_{35}COOH$ $C_{15}H_{31}COOH$ $C_{17}H_{35}COONa$ $C_{17}H_{33}COOH$

31

The structure (formula) of pentyne is

- $CH_3 - CH_2 - CH_2 - CH_2 - CH_3$ $CH_3 - CH_2 - CH_2 - CH = CH_2$
 $CH_3 - CH_2 - CH_2 - C \equiv CH$ $CH_3 - CH = CH - CH_2 - CH_3$

32

The difference in the mass between C_2H_4 and C_3H_6 is

- 28 14 12 8

33

The general formula of alcohols is

- $C_nH_{2n+2}^{-OH}$ $C_nH_{2n}^{-OH}$ $C_nH_{2n-2}^{-OH}$ $C_nH_{2n+1}^{-OH}$

34

The functional group of ketone is

- $\begin{array}{c} O \\ || \\ -C-H \end{array}$ $\begin{array}{c} O \\ || \\ -C-OH \end{array}$ $\begin{array}{c} O \\ || \\ C-C-C \end{array}$ $\begin{array}{c} O \\ || \\ -C-O-C \end{array}$

35

The distance between the two layers of graphite is

- $1.54A^\circ$ $1.42A^\circ$ $3.35A^\circ$ $1.20A^\circ$

36

IUPAC name of alkene containing 3 carbon atoms is

- Propane Propene Propyne Butane

37

The sodium salt of a long chain carboxylic acid possessing cleaning property is

- An ester A detergent A soap A fat

38

Open chain saturated hydrocarbons are called

- Paraffins Alkenes Alkynes Alkyl groups

39

The excited state electronic configuration of carbon is

- $1s^2 2s^2 2p^2$ $1s^2 2s^2 2p^3$ $1s^2 2s^1 2p^3$ $1s^1 2s^2 2p^3$

40

The isomer of n-butane is

- Propane 2-methylpropane Butane 3-methyl butane

41

The shape of diamond is

- Tetrahedral Linear Hexagonal ring Trigonal planar

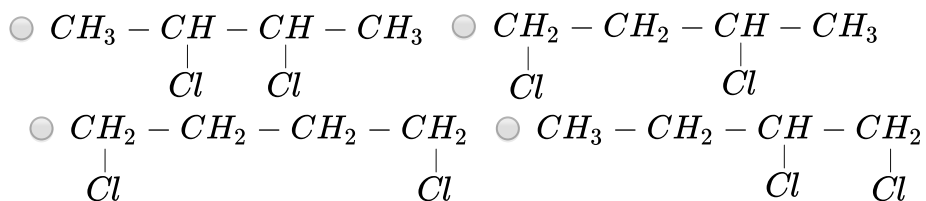
42

The structure of Butanoic acid is

- $CH_3 - CH_2 - CH_2 - CHO$ $CH_3 - CH_2 - CH_2 - OH$
 $CH_3 - CH_2 - CH_2 - COOH$ $CH_3 - CH_2 - CH_2 - CH_2 - COOH$

43

The structure of 2, 3-dichloro butane is



44

The IUPAC name of $\underset{\substack{| \\ Cl}}{CH_2} - \underset{\substack{| \\ Cl}}{CH} - CHO$ is

- 1, 2 - dichloro propanol 2, 3- dichloro propanol 2, 3- dichloro propanal
 1, 2 - dichloro propanal

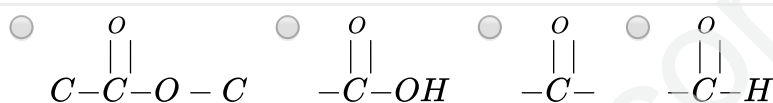
45

The gas liberated when ethanol reacts with sodium is

- O_2 H_2 $CO + H_2$ $CO_2 + H_2$

46

The functional group of ester is



47

The products formed in the esterification reaction are

- Ester and H_2 Ester + O_2 Ester + H_2O Ester + CO_2

48

The product formed along with soap in the saponification reaction is

- Fat Oil Glycerol Glyoxal

49

A spherical aggregate of soap molecules in water is called

- Detergent Glycerol Easter Micelle

50

When soap is dissolved in water, which end of the soap attracted

towards grease (or) oil ?

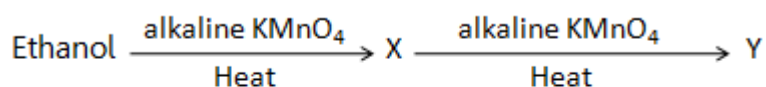
- Hydrophobic end Hydrophilic end Both none

51

An organic compound "X" produces brisk effervescence on addition of Na_2CO_3 . The compound "X" is

- Ethanol Ethanal Ethanoic acid Ethane

52



In the given equation the compound X and Y are

- Ethane, Ethene Ethene, H_2 Ethanal, Ethanoic acid Ethanal, Ethanoic acid
 Ethanal and Ethanol

53

$(C_{17}H_{33}COO)_3C_3H_5 + 3NaOH \longrightarrow 3C_{17}H_{33}CONa + \text{"X"}$. The number of -OH groups present in the compound "X" is

- 2 3 1 4

54

Ethanol + Sodium \longrightarrow Sodium ethoxide + gas "X". In the given equation, the gas "X" is

- O_2 CO_2 H_2 CO

55

An organic compound with molecular formula $C_2H_4O_2$ produces brisk effervescence on addition of Na_2CO_3 . The brisk effervescence is due to the liberation of

- H_2 O_2 CO_2 CO

56

1 ml of glacial acetic acid and 1 ml of ethanol are mixed together in a

test tube. Few drops of conc. H_2SO_4 is added in the mixture are warmed in a waterbath for 5 min. The product formed in this reaction is

- CH_3COOH C_2H_5OH $CH_3COOC_2H_5$ CH_3CHO

57

Acetic acid, when dissolved in water it dissociates into ions reversibly, this is because acetic acid is a

- weak acid strong acid weak base strong base

58

Combustion of hydrocarbons is generally accompanied by the evolution of

- Heat Light both heat and light Electricity

59

If 2 ml of acetic acid was added slowly in drops to 5 ml of water then we will notice

- The acid forms a layer on water Water forms a layer on acid
 Formation of a clear and homogeneous solution Formation of CO_2 gas

60

Among the following, the isomers are

- n-Butane and n-Pentane n-Butane and isobutane n-Butane and isopentane
 Butene and Propane

61

Name the product other than water formed on burning of ethanol in air.

- H_2 CO CO_2 C_2H_4

62

What are the various possible structural formulae of a compound having molecular formula C_3H_6O ?

- $CH_3-\overset{O}{\parallel}C-CH_3, CH_3-CH_2-COOH$
- $CH_3-\overset{O}{\parallel}C-CH_3, CH_3-CH_2-CH_2-CHO$
- $CH_3-\overset{O}{\parallel}C-CH_3, CH_3-CH_2-CHO$
- $CH_3-CH_2-CHO, CH_3-CH_2-COOH$

63

The IUPAC name of the simplest ketone is

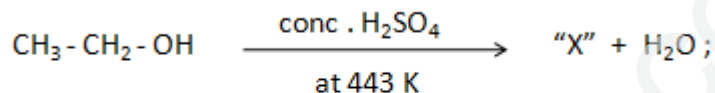
- Acetone Butanone Propanone Propanal

64

The IUPAC name of the next homologous of
 $CH_3-CH_2-CH_2-OH$

- 1-propanol 1-butanol 1-butanal 1-propanal

65



In the given equation the compound "X" is a

- Alkane Alkene Alkyne Alkyl group

66

Which of the following acid is present in vinegar ?

- Hydrochloric acid Sulphuric acid Acetic acid Stearic acid

67

"X" is the allotropic form of carbon, which is a good conductor of electricity and used as a lid in lead pencils. The "X" is

- Coal Charcoal Diamond Graphite

68

The hybridisation of carbon in diamond and graphite is ___ and ___

- sp, sp^2 sp^2, sp^3 sp^3, sp^2 sp^2, sp

69

The first member of the homologous series of alcohol is

- Ethanol Propanol Methanol Methanal

70

An organic compound "X" with a molecular formula C_2H_6O undergoes oxidation in the presence of acidified $K_2Cr_2O_7$ and forms the compound "Y", which has molecular formula $C_2H_4O_2$. Identify X and Y

- $X = CH_3COOH$, $Y = C_2H_5OH$ $X = C_2H_5OH$, $Y = CH_3COOH$
 $X = CH_3CHO$, $Y = CH_3COOH$ $X = CH_3COOH$, $Y = CH_3CHO$

71

The IUPAC name of $CH_3 - CH_2 - CH_2 - CHO$ is

- Butanol Butanal Butanone Butanoic acid

72

Why do sometimes cooking vessels get blackened on a gas or kerosene stove ?

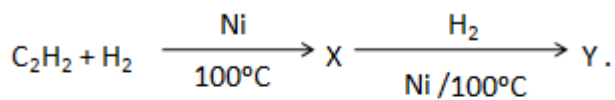
- because of complete combustion of fuel because of incomplete combustion of fuel
 because, vessels are made up of Iron because, vessels are made up of Aluminium

73

$2X + 5O_2 \longrightarrow 4CO_2 + 2H_2O + Heat$. The given equation is combustion of hydrocarbon "X". The substance "X" is used in the artificial ripening of fruits. Identify the substance "X"

- C_4H_{10} C_2H_4 C_2H_2 C_2H_6

74



In the given equations, identify the substance "Z"

- C_2H_4 C_2H_2 CH_3Cl C_2H_5Cl C_2H_5Cl

75

The principal chain of following $(CH_3)_2CH_2CH_3$ compound contains how many carbon atoms ?

- 3 4 2 5

76

Which of the following molecular formulae belongs to alkyne series ?

- C_7H_{14} $C_{10}H_{22}$ C_9H_{16} $C_{16}H_{12}$

77

The homologue of ethyne is

- C_2H_4 C_3H_6 C_3H_8 C_3H_4

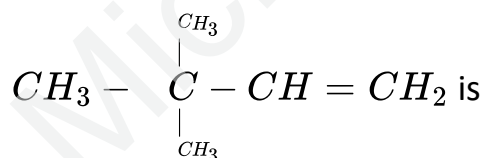
78

The correct boiling point order of corresponding hydrocarbons is

- Alkyne > Alkane > Alkene Alkane > Alkene > Alkyne Alkyne > Alkene > Alkane
 Alkene > Alkyne > Alkane

79

The IUPAC name of



- 3, 3, 3-trimethyl-1-propene 1, 1 - dimethyl-2-propene 3, 3 - dimethyl-1-butene
 2, 2 - dimethyl-3-butene

80

The final product formed in the halogenation of methane is

- CH_3Cl CH_2Cl_2 $CHCl_3$ CCl_4

81

The gas liberated when ethanoic acid reacts with active metals like sodium ?

- O_2 CO_2 CO H_2

82

Ethanoic acid reacts with sodium hydroxide and forms

- Ethanal Ethanol Sodium acetate Sodium formate

83

If a hydrocarbon contains 14-H atoms and 8 carbon atoms, then the hydrocarbon belongs to

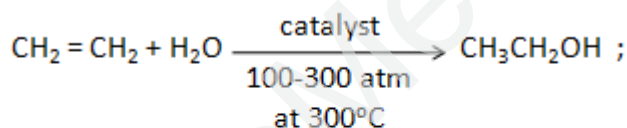
- Alkane Alkene Alkyne Alkyl group

84

The correct order of boiling point of C_3H_8 , C_5H_{12} and C_4H_{10} is

- $C_5H_{12} < C_4H_{10} < C_3H_8$ $C_5H_{12} > C_4H_{10} > C_3H_8$
 $C_4H_{10} < C_3H_8 < C_5H_{12}$ $C_3H_8 < C_5H_{12} < C_4H_{10}$

85



The catalyst used in the given equation is

- Ni Fe P_2O_5 P_2O_5 Chlorophyll

86

Identify the correct statement, when soap is used to remove dirt present on the cloth i.e., cleansing action of soap

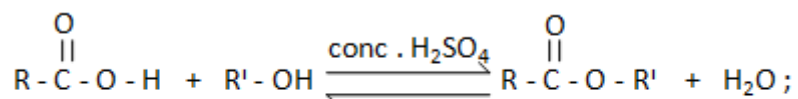
- (i) The polar end of the soap is hydrophilic in nature and this end is attracted towards water.
(ii) The non-polar end of the soap is hydrophobic in nature and it is

attracted towards dirt (grease (or) oil).

(iii) The molecules of soap surround the dirt particle at the centre of the cluster and form a spherical structure.

- only (i) is correct only (ii) is correct only (iii) is correct All are correct

87



In the given equation, R, R' indicates

- Alkane group Alkene group Alkyne group Alkyl group Alkyl group

88

Propane-1, 2, 3 - triol is also known as

- Marsh gas Glycol Glycerol Ester

89

Which of the four test tubes containing the following chemicals shows the brisk effervescence when dilute acetic acid was added to them ?

i) KOH ii) NaHCO_3 iii) K_2CO_3 iv) NaCl

- i & ii ii & iv i & iv ii & iii

90

When acetic acid reacts with ethyl alcohol, we add conc H_2SO_4 , it acts as _____ and the process is called _____

- Oxidizing agent, Saponification Dehydrating agent, Esterification
 Reducing agent, Esterification Acid, Esterification

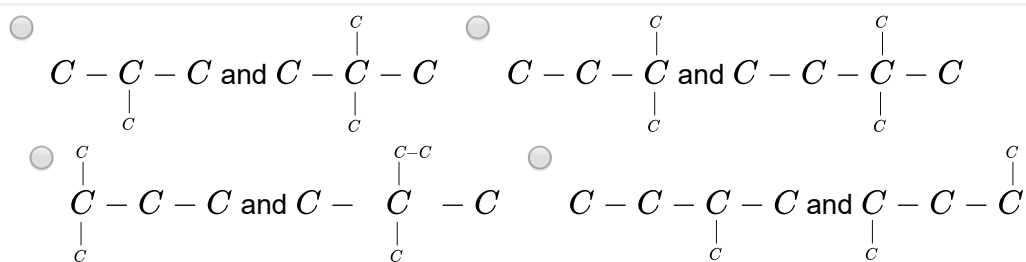
91

Among the following, the incorrect statement is

- In diamond, each carbon is surrounded by four other carbon atoms
 Graphite is a good conductor of electricity
 Diamond is a good conductor of electricity
 In graphite, each carbon is surrounded by three other carbon atoms

92

Which of the following pairs of carbon skeletons is an example of isomers ?



93

Which type of reaction is not shown by C_2H_4 at all ?

- Addition Substitution Oxidation Combustion

94

The compound with highest boiling point is

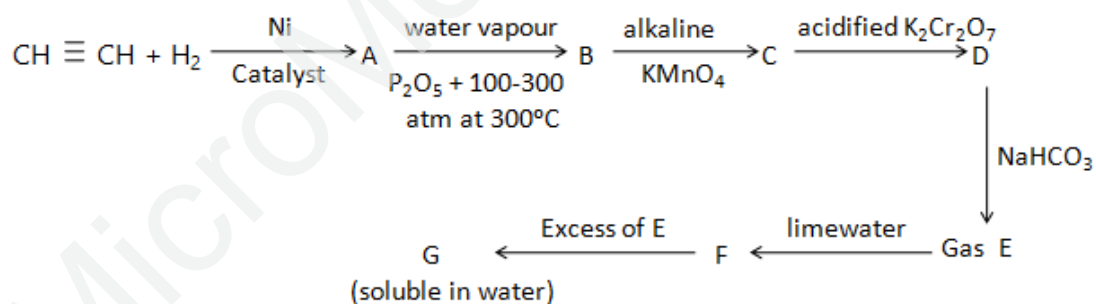
- n-hexane n-pentane 2,2-dimethyl propane 2-methyl butane

95

The double bond formed between two carbon atoms in C_2H_4 molecule due to the sharing of

- 2 electrons 6 electrons 4 electrons 8 electrons

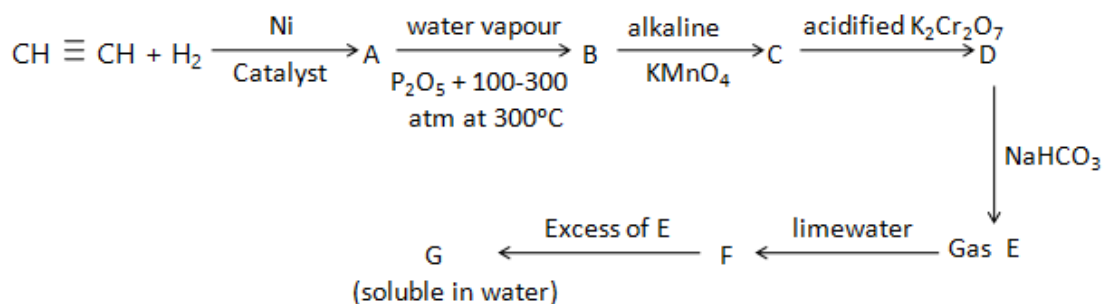
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Identify the compounds B and G

- CH_3COOH, CO_2 CH_3CH_2OH, CO_2 $CH_2 = CH_2, CH_3COOH$
 $CH_3CH_2OH, Ca(HCO_3)_2$ $CH_3CH_2OH, Ca(HCO_3)_2$

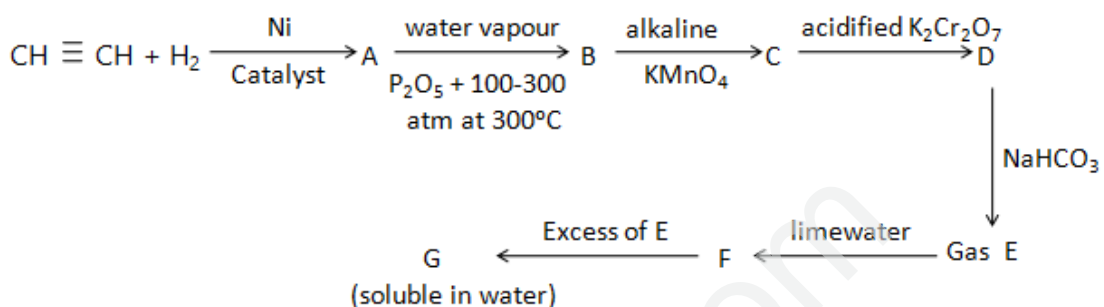
97



Identify the functional group present in the compound D

- Aldehyde
 Alcohol
 Carboxylic acid
 Carboxylic acid
 Ketone

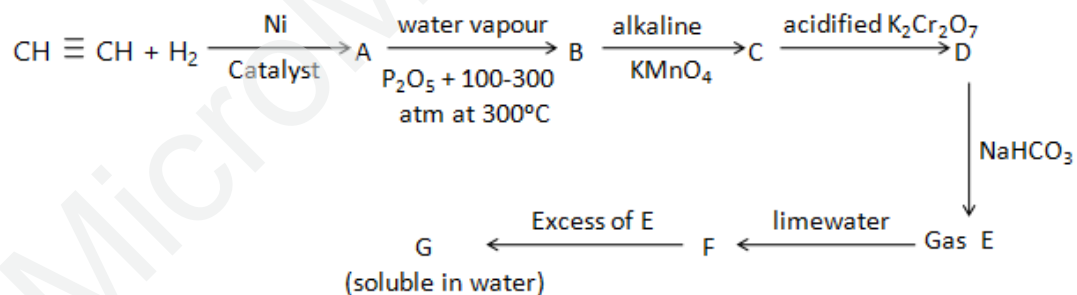
98



The type of reaction involved in the formation A is

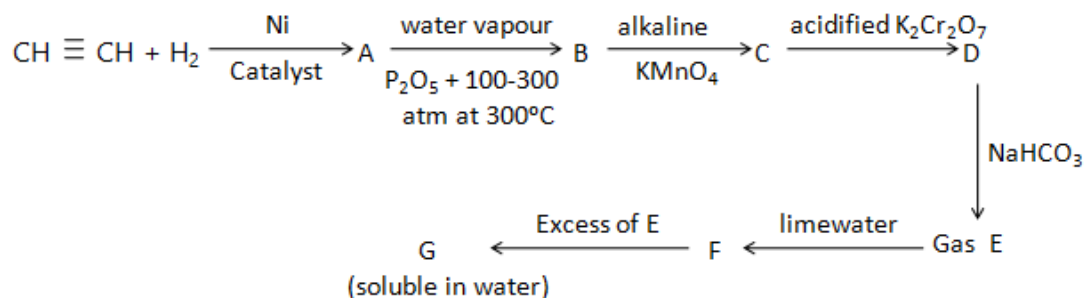
- Halogenation
 Carboxylation
 Decarboxylation
 Hydrogenation
 Hydrogenation

99



The compound formed along with gas E, when the substance D reacts with NaHCO_3 is

- $\text{C}_2\text{H}_5\text{ONa}$
 CH_3COONa
 CH_3COONa
 H_2
 O_2



Identify the compound F

- CH_3COOH
 $\text{Ca}(\text{HCO}_3)_2$
 CaCO_3
 CaCO_3
 $\text{C}_2\text{H}_5\text{OH}$

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