

Solved Example

Ex.1 Which of the following compounds will form a hydrocarbon on reaction with a Grignard reagent -

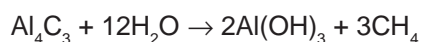
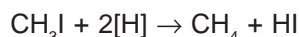
- [1] $\text{CH}_3\text{CH}_2\text{OH}$ [2] CH_3CHO [3] CH_3COCH_3 [4] $\text{CH}_3\text{CO}_2\text{CH}_3$

Sol. [3] $\text{CH}_3\text{CH}_2\text{OH} + \text{RMgX} \rightarrow \text{R-H} + \text{MgX}(\text{OC}_2\text{H}_5)$

Ex.2 Methane is formed when -

- [1] Sodium acetate is heated with soda-lime [2] Iodomethane is reduced
[3] Aluminium carbide reacts with water [4] All.

Sol. [4] $\text{CH}_3\text{COONa} + \text{NaOH} \xrightarrow{\text{CaO}} \text{CH}_4 + \text{Na}_2\text{CO}_3$



Ex.3 If n is the number of carbon atoms in the potassium salt of a carboxylic acid, then the alkane formed on electrolysis of aqueous solution of this salt would have carbon atoms equal to -

- [1] n [2] $n - 1$ [3] $2n - 1$ [4] $2(n - 1)$

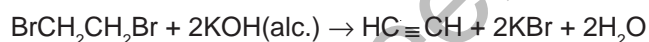
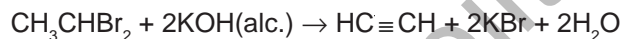
Sol. [4] $2\text{RCOO}^- \rightarrow \text{R-R} + 2\text{CO}_2 + 2\text{e}^-$

R-R has $2(n-1)$ carbon atoms.

Ex.4 Ethyne can be prepared in a single step from -

- [1] Calcium carbide [2] Ethylidene bromide [3] Ethylene bromide [4] All of these

Sol. [4] $\text{CaC}_2 + 2\text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + \text{C}_2\text{H}_2$



Ex.5 2,3-Dibromobutane, when heated with zinc dust, yields -

- [1] 2-Butene [2] 2-Butyne [3] 1-Butene [4] Butane.

Sol. [1] Heating with zinc dust brings about dehalogenation of 2, 3-dibromobutane.

Ex.6 An aqueous solution of potassium salt of fumaric acid is electrolyzed. The hydrocarbon produced at anode is

- [1] Ethane [2] Ethene [3] Methane [4] Ethyne

Sol. [4]
$$\begin{array}{c} \text{CHCOOK} \\ || \\ \text{CHCOOK} \end{array} + 2\text{H}_2\text{O} \xrightarrow{\text{Electrolysis}} \begin{array}{c} \text{CH} \\ ||| \\ \text{CH} \end{array} + 2\text{CO}_2 + \text{H}_2 + 2\text{KOH}$$

Potassium fumarate

Acetylene

Ex.7 2-Pentyne can be converted into trans-pent-2-ene by reaction with -

- [1] H_2/Ni [2] $\text{H}_2/\text{Lindlar's catalyst}$
[3] $\text{Na/Liq} : \text{NH}_3$ [4] Zn/HCl .

Sol. [3] Sodium in the presence of liquid ammonia converts alkynes to corresponding trans-alkenes.

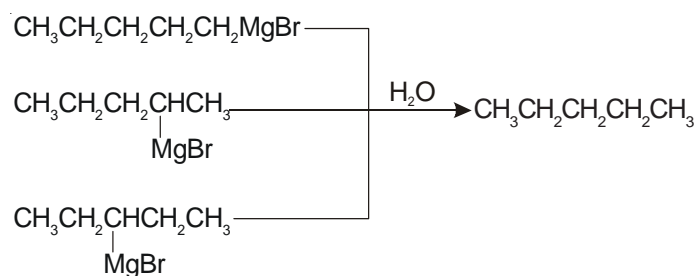
Ex.8 How many different isomeric compounds having molecular formula $C_5H_{11}Br$ on reaction with Mg, Followed by hydrolysis can yield pentane -

[1] 4

[2] 2

[3] 3

[4] 5

Sol. [3]

Ex.9 Which of the following compounds has the highest melting point -

[1] n-Butane

[2] n-Pentane

[3] n-Hexane

[4] n-Heptane

Sol. [4] n-heptane has the longest chain of carbon atoms.

Ex.10 Which of the following compounds has the highest boiling point -

[1] Ethene

[2] Propene

[3] cis-2-Butene

[4] trans-2-Butene

Sol. [3] cis-Isomer has higher boiling point than trans due to its greater polarity.

Ex.11 The density of a hydrocarbon at N.T.P. 2.5 gram/lit. What is hydrocarbon.

Sol. Density of 1 lit. hydrocarbon = 2.5 gram/lit

$$\therefore \text{Mol. wt. of H.C.} = 2.5 \times 22.4 = 56$$

After mol. wt. we calculate the molecular formula

$$C_n H_{2n+2} = \text{mol. wt. (Alkane) or } 14n+2 = \text{mol. wt.}$$

$$C_n H_{2n} = \text{mol. wt. (Alkene) or } 14n = \text{mol. wt.}$$

$$C_n H_{2n-2} = \text{mol. wt. (Alkyne) or } 14n-2 = \text{mol. wt.}$$

with the help of above three formulae, we can identify the given H.C. $14n = 56$ (Alkene) $\Rightarrow n = 4$

$$\therefore \text{Hydrocarbon is } C_4H_8$$

Ex.12 8 C.C. of gaseous hydrocarbon requires 40 C.C. of O_2 for complete combustion which hydrocarbon is this.

Sol. Vol. of hydrocarbon = 8 C. C.

Vol. of O_2 = 40 c.c.

$$\Rightarrow \frac{8}{40} = \frac{2}{3n-1} \quad (\text{for alkane})$$

$$\frac{1}{10} = \frac{2}{3n+1} \quad \text{or } 3n + 1 = 10$$

$$3n = 10 - 1 = 9 \quad \text{in } = 3$$

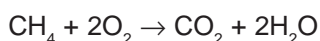
$$\therefore \text{Hydrocarbon is } C_3H_8 \text{ (Propane)}$$

Ex.13 10 ml of a mixture of CH_4 and C_3H_8 requires 41 ml. of oxygen for complete combustion. What is the vol. of CH_4 and C_3H_8 in the mixture.

Sol. Suppose the volume of CH_4 in $(CH_4 + C_3H_8)$ mix = x C.C.

= Vole. of C_3H_8 will be $10 - x$ C.C

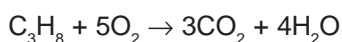
For CH_4



\therefore 1 Vol. of CH_4 requires 2 vol. of O_2 for complete combustion

$\therefore x$ c.c. of $\text{CH}_4 = 2x$ C.C. of O_2

For C_3H_8



\therefore 1 vol. of C_3H_8 requires 5 ml of O_2 for complete combustion

\therefore $(10 - x)$ C.C. of C_3H_8 requires $5(10 - x)$ C.C. of O_2

Total Vol. of $\text{O}_2 = 2x + 5(10 - x)$ it is equivalent to 41

(According to question)

$$\therefore 2x + 5(10 - x) = 41 \Rightarrow x = 3 \text{ C.C.}$$

Ans. Vol. of CH_4 is 3 c.c. and Vol. of C_3H_8 is 7 C.C.

Ex.14 If 5 gm $\text{C}_2\text{H}_5\text{I}$ reacts with Na (Metallic) in presence of ether, and the yield is 60% then how many grams of n-butane will you get.



Mol. wt. of $\text{C}_2\text{H}_5\text{I} = 24 + 5 + 127 = 156$

Mol. wt. of $\text{C}_4\text{H}_{10} = 48 + 10 = 58$

Two molecule of $\text{C}_2\text{H}_5\text{I}$ are taking part in above reaction

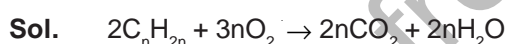
\therefore We get 58 gm. of C_4H_{10} from 2×156 gm of $\text{C}_2\text{H}_5\text{I}$

\therefore We get $\frac{58}{2 \times 156}$ gm. of C_4H_{10} from 1 gm of $\text{C}_2\text{H}_5\text{I}$

\therefore We get $\frac{58 \times 5}{2 \times 156}$ gm. of C_4H_{10} from 5 gm of $\text{C}_2\text{H}_5\text{I}$ yield in 60%

So the quantity of C_4H_{10} will be $\frac{58 \times 5}{2 \times 156} \times \frac{60}{100} \text{ gm} = 0.55 \text{ gm.}$

Ex.15 How many mole oxygen is required for complete combustion of 1 mole of Alkene.



keeping in mind, the above equation

\therefore for 2 mole of alkene, $3n$ mole of O_2 is required for combustion

\therefore for 1 mole of alkene, $\frac{3n}{2}$ mole of O_2 is required for combustion.

= $1.5n$ mole of O_2

Ex.16 The density of one hydrocarbon at N.T.P. in 1.964 gm/lit. Which hydrocarbon is this.

Ans. Mol. wt. of Hydrocarbon

= density of 1 lit. \times 22.4

= 1.964×22.4

= 44

So mol. wt. of hydrocarbon = 44

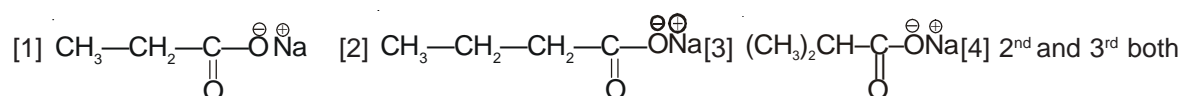
So the hydrocarbon is C_3H_8 (Propane)

Exercise # 1

- Q.1** On cracking of petrol, we get :
- [1] CH₄ [2] C₃H₆
[3] Both of the above [4] CH₃ + CH₄ + C₂H₆ + alcohols
- Q.2** Photochemical chlorination of alkane is initiated by a process of :
- [1] Pyrolysis [2] Substitution [3] Homolysis [4] Peroxidation
- Q.3** Lead tetraethyl is used as :
- [1] Fire extinguisher [2] Pain killer [3] Petroleum additive [4] Mosquito repellent
- Q.4** Formation of alkane by action of Zn on alkyl halide is called :
- [1] Frankland reaction [2] Cannizzaro's reaction [3] Wurtz reaction [4] Kolbe's reaction
- Q.5** The following reaction is an example of :
- $$\text{C}_3\text{H}_8 + 2\text{Cl}_2 \xrightarrow{\text{Light}} \text{C}_3\text{H}_7\text{Cl} + 2\text{HCl}$$
- [1] An addition reaction [2] A substitution reaction
[3] An oxidation reaction [4] Elimination reaction
- Q.6** Petroleum consists mainly of :
- [1] Aliphatic hydrocarbons [2] Aromatic hydrocarbons
[3] Aliphatic alcohols [4] None of the above
- Q.7** By coal-tar distillation which is not obtained :
- [1] Light oil [2] Middle oil [3] Heavy oil [4] Mobil oil
- Q.8** Highest boiling point is expected for :
- [1] Isooctane [2] n-octane
[3] 2, 2, 3, 3-tetra methyl butane [4] n-Butane
- Q.9** Which of the following represents the most oxidised form of hydrocarbon R – CH₃ :
- [1] CO₂ [2] RCHO [3] RCOOH [4] RCO.OOH
- Q.10** The order of reactivity of halogens in substitution reaction in polar protic solvent is :
- [1] F > Cl > Br > I [2] I > Br > Cl > F [3] F > Br > Cl > I [4] F > Cl = Br > I
- Q.11** $2\text{CH}_4 + \text{O}_2 \xrightarrow[200^\circ\text{C}, 100\text{atm}]{\text{copper-tube}}$ Product is :
- [1] Formaldehyde and H₂ [2] Acetic acid [3] Carbondioxide [4] Methanol
- Q.12** Which of the following compounds should undergo chlorination faster than the remaining three ?
- [1] n-Pentane [2] Neopentane [3] Isopentane [4] n-Butane
- Q.13** Which of the following alkanes should have lower boiling point ?
- [1] Triptane [2] Isoheptane [3] Neoheptane [4] n-Heptane
- Q.14** Which of the following reagents cannot be used for preparing an alkane from a ketone ?
- (A) Zn/Hg+ conc. HCl (B) Red P + I₂
(C) H₂NNH₂ and C₂H₅ONa (D) NaBH₄
- [1] A and B [2] A and C [3] B and D [4] C and D
- Q.15** Which of the following is the principal constituent present in liquefied petroleum gas (L.P.G) ?
- [1] Propane [2] n-Butane [3] Ethane [4] Methane

- Q.16** The main constituents of calor gas are :
- [1] Methane + Ethane [2] Isobutane + n-Butane
 [3] Propane + n-Butane [4] Methane + Ethane + Propane
- Q.17** Which of the following gases is present as chief constituent in fire damp ?
- [1] CO [2] CH₄ [3] C₂H₂ [4] H₂S
- Q.18** Methane reacts with chlorine in direct sunlight to form :
- [1] C + HCl [2] CCl₄ + HCl [3] CHCl₃ + HCl [4] CH₃Cl + HCl
- Q.19** Which of the following processes is suitable for converting methanoic acid to a paraffin ?
- [1] Electrolysis of sodium salt [2] Reduction with red P + HI
 [3] Decarboxylation [4] Reduction with LiAlH₄
- Q.20** How much air should be required for complete combustion of 44 grams of propane at normal temperature and pressure ?
- [1] 25L [2] 15 L [3] 25 moles [4] 10 moles
- Q.21** Which of the following can be used for the preparation of an alkane ?
- [1] Reduction of an alkyl halide
 [2] Reaction of a Grignard reagent with a compound having reactive hydrogen atom
 [3] Reduction of a ketone
 [4] All of the above
- Q.22** A war gas can be prepared from an aliphatic hydrocarbon by the reaction of :
- [1] AsCl₅ [2] S₂Cl₂ [3] SCl₂ [4] As₂O₃
- Q.23** Which of the following is not a gas at room temperature ?
- [1] Propane [2] Ethylene [3] n-Pentane [4] Ethane
- Q.24** Suitable for preparation of higher alkanes from a lower alkyl halide is subjected to -
- [1] Reduction [2] Hoffmann bromamide reaction
 [3] Hunsdiecker reaction [4] Wurtz reaction
- Q.25** The organic reaction product from the reaction of methyl magnesium bromide and ethyl alcohol is -
- [1] Methane [2] Ethane [3] Propane [4] Butane
- Q.26** Aqueous solution of which compound gave ethane on electrolysis -
- [1] Acetic acid [2] Acetamide [3] Potassium acetate [4] Ethyl acetate
- Q.27** In the complete combustion of C_nH_{2n+2}, the number of oxygen moles required is -
- [1] n/2O₂ [2] $\left(\frac{n+1}{2}\right)$ O₂ [3] $\left(\frac{3n+1}{2}\right)$ O₂ [4] $\left(\frac{n+2}{2}\right)$ O₂
- Q.28** The catalyst used to convert alkanes containing 6 to 10 carbon atoms into benzene and its homologous at nearly 600° C are -
- [1] Cr₂O₃ and Al₂O₃ [2] Cr₂O₃ and AlCl₃ [3] H₂SO₄ and HF [4] BF₃

Q.29 Which sodium salt will be heated soda lime to obtain propane -



Q.30 Alkyl halides on reduction with Zn-Cu couple and alcohol give -

- [1] Alkanes [2] Alkenes [3] Alkynes [4] Cyclic compounds

Q.31 The most volatile alkane is -

- [1] n-pentane [2] isopentane [3] neopentane [4] n-hexane

Q.32 Wurtz reaction is best used for making -

- [1] Unbranched alkanes [2] symmetrical alkanes
[3] Unsymmetrical alkanes [4] n-Alkanes with odd. number of carbon

Q.33 What are the gases evolved at anode during Kolbe synthesis -

- [1] Hydrocarbons [2] CO_2 [3] Both [4] None

Q.34 Which one of the following compounds does not form an ozonide -

- [1] Ethene [2] Propyne [3] Propene [4] Propane

Q.35 Conversion of CH_4 to CH_3Cl is an example of reaction -

- [1] Free radical substitution [2] Free radical addition
[3] Electrophilic substitution [4] Nucleophilic substitution

Q.36 $\text{CH}_2 = \text{CH}_2$ reacts with HCl to form :

- [1] $\text{ClCH} = \text{CH} - \text{Cl}$ [2] $\begin{array}{c} \text{CH}_2 - \text{CH}_3 \\ | \\ \text{Cl} \end{array}$ [3] $\text{CH}_2\text{Cl} - \text{CH}_2\text{Cl}$ [4] CH_3CHCl_2

Q.37 Hydrocarbon containing following bond is most reactive towards electrophile ?

- [1] $\text{C} \equiv \text{C}$ [2] $\text{C} = \text{C}$ [3] $\text{C} - \text{C}$ [4] All

Q.38 Ethylene reacts with alkaline KMnO_4 (Baeyer's reagent) to form :

- [1] Oxalic acid [2] Acetic acid [3] Glycol [4] Glycerol

Q.39 When propylene reacts with hydrogen bromide in the presence of peroxide, the product formed is :

- [1] n-Propyl alcohol [2] Propylene peroxide [3] n-Propyl bromide [4] 1, 3-dibromo propane

Q.40 Cyclopentene on treatment with alkaline KMnO_4 gives :

- [1] Cyclopentanol [2] Trans-1, 2-cyclopentanediol
[3] Cis-1, 2-cyclopentanediol [4] 1 : 1 mixture of cis- and trans-1, 2-cyclopentanediol

Q.41 Ethylene from ethyl bromide is obtained by treating it with -

- [1] Hydrogen [2] Alcoholic caustic potash
[3] Aqueous caustic potash [4] Aqueous caustic soda

Q.42 Ethylene can be prepared by electrolysis of an aqueous solution of :

- [1] Sodium acetate [2] Sodium succinate [3] Sodium fumarate [4] Sodium propionate

- Q.43** Ethyl alcohol is heated with conc. H_2SO_4 . The product formed is :
- [1] $\text{H}_3\text{C}-\overset{\text{O}}{\parallel}{\text{C}}-\text{OC}_2\text{H}_6$ [2] C_2H_6 [3] C_2H_4 [4] C_2H_2
- Q.44** Ethylene readily undergoes the following type of reaction :
- [1] Addition [2] Substitution [3] Elimination [4] Rearrangement
- Q.45** Which of the following types of reactions occur when a reactant has got a double bond ?
- [1] Addition [2] Photolysis [3] Substitution [4] Polymerization
- Q.46** Which one of the following organic compounds decolourizes an alkaline KMnO_4 solution :
- [1] CS_2 [2] C_3H_6 [3] C_3H_8 [4] CH_3OH
- Q.47** Conjugated double bond is present in :
- [1] Propylene [2] Isobutylene [3] 1, 3-Butadiene [4] Butylene
- Q.48** A compound "X" on ozonolysis forms two molecules of HCHO . "X" is :
- [1] C_2H_4 [2] C_2H_2 [3] C_2H_6 [4] C_6H_6
- Q.49** Formation of ethylene from ethyl bromide is a case of :
- [1] Addition reaction [2] Substitution reaction
[3] Elimination reaction [4] Rearrangement reaction
- Q.50** Electrolysis of cold concentrated aqueous solution of potassium succinate yields :
- [1] Ethane [2] Ethyne [3] Ethene [4] Ethane-1, 2-diol
- Q.51** The products of oxidative ozonolysis of an unsymmetrical alkene are :
- [1] alcohol and/or acids [2] aldehydes and/or acids
[3] ketones and/or acids [4] aldehydes and/or ketones
- Q.52** The reaction of propene with HOCl proceeds via the addition of :
- [1] H^+ in the first step [2] Cl^+ in the first step
[3] OH^- in the first step [4] Cl^- and OH^- in a single step
- Q.53** In the presence of peroxide, hydrogen chloride and hydrogen iodide don't give anti Markonikov's addition to alkene because :
- [1] both are highly ionic
[2] one is oxidising and other is reducing
[3] one of the steps is endothermic in both the case
[4] all the steps are exothermic in both the case
- Q.54** Which of the following cannot give ethene on pyrolysis ?
- [1] Ethane [2] Propane [3] Ethyl acetate [4] Isobutane
- Q.55** Hydroxylation of alkenes cannot be achieved by :
- [1] Baeyer's reagent [2] osmium tetroxide [3] dilute KMnO_4 solution [4] acid permanganate
- Q.56** An alkene is not formed on the reaction of zinc dust with :
- [1] a *gem* dibromide [2] a *vic* dibromide [3] vinyl bromide [4] isopropylidene dibromide
- Q.57** Polymerisation of vinyl acetate is used for the preparation of :
- [1] a plastic [2] an adhesive [3] a fibre [4] a rubber

Q.58 Which of the following catalysts is regarded as most appropriate for polymerisation of propylene ?

- [1] $(\text{CH}_3)_3\text{Al} + \text{AlCl}_3$ [2] $(\text{C}_2\text{H}_5)_3\text{Al} + \text{TiCl}_4$ [3] $\text{Al}_2\text{O}_3 + \text{CH}_3\text{Cl}$ [4] $\text{AlBr}_3 + \text{HBr}$

Q.59 Markownikoff rule does not apply on the addition of HX on the following alkene ?

- [1] 1-Butene [2] 3-Hexene [3] Propene [4] 1-Pentene

Q.60 Which of the following is known as Lindlar's catalyst ?

- [1] $\text{R}_3\text{Al} + \text{TiCl}_4$ [2] $\text{Pd}/\text{CaCO}_3 + \text{Quinoline} + \text{Lead acetate}$
 [3] $\text{Pd}/\text{BaSO}_4 + \text{CaCO}_3$ [4] $\text{Mg}/\text{Hg} + \text{H}_2$

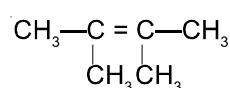
Q.61 The polymer of acrylonitrile is :

- [1] terylene [2] orlon [3] PVC [4] bakelite

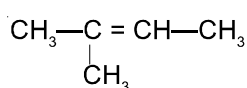
Q.62 Action of RMgX with vinyl chloride gives -

- [1] Alkane [2] Alkyne [3] Alkene [4] All

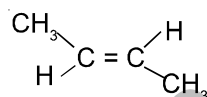
Q.63 The relative stability of the compounds -



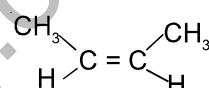
(i)



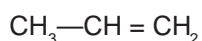
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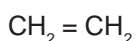
(ii)



(iv)



(v)



(vi)

is in the order

- [1] $i > ii > iii > iv > v > vi$ [2] $vi > v > iv > iii > ii > i$ [3] $i > iii > v > ii > iv > vi$ [4] $ii > i > iv > iii > v > vi$

Q.64 The reaction of an alkene with peracids to form an epoxide is known after the name of -

- [1] Baeyer [2] Brown [3] Prileshchiaev [4] Kharasch

Q.65 Cis-2-Butene cannot be changed to trans-2-butene because -

- [1] Cis isomer has two hydrogen atoms on the same side of the π bond
 [2] Trans isomer has two hydrogen atoms on the opposite of the π bond
 [3] Of hindered rotation about the carbon-carbon double bond
 [4] The transformation does not required energy

Q.66 Identify X in the reaction $\text{CH}_2 = \text{CH}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{intermediate} \xrightarrow[\text{boil}]{\text{H}_2\text{O}} \text{X}$ -

- [1] CH_3OH [2] $\text{CH}_3\text{CH}_2\text{OH}$ [3] CH_3COCH_3 [4] CH_3OCH_3

Q.67 The acetylene molecule contains :

- [1] 5 sigma bonds [2] 4 sigma and 1 pi bonds
 [3] 3 sigma and 2 pi bonds [4] 2-sigma and 3 pi bonds

Q.68 Acetylene reacts with HCl to produce :

- [1] 1, 1-dichloroethane [2] 1, 2-dichloroethane
 [3] 1, 1, 1-trichloroethane [4] None of these

Q.69 Polymerization of acetylene leads to the formation of :

- [1] Benzene [2] Butane [3] Naphthalene [4] Octane

Q.70 Acidic hydrogen is present in :

- [1] Ethyne [2] Ethene [3] Benzene [4] Ethane

- Q.71** Acetylene reacts with 42% H_2SO_4 containing 1% HgSO_4 to give :
 [1] $\text{C}_2\text{H}_3\text{HSO}_4$ [2] CH_3CHO [3] HCHO [4] $\text{CH}_2 = \text{CH}_2$
- Q.72** Acetylene reacts with ammoniacal AgNO_3 forming :
 [1] Silver mirror [2] Metal silver [3] Silver acetate [4] Silver acetylide
- Q.73** Propyne and propene can be distinguished by :
 [1] Conc. H_2SO_4 [2] Br_2 in CCl_4 [3] Dilute KMnO_4 [4] AgNO_3 in Ammonia
- Q.74** $\text{CH}\equiv\text{CH} \xrightarrow{\text{O}_3/\text{NaOH}} \text{X} \xrightarrow{\text{Zn}/\text{CH}_3\text{COOH}} \text{Y}$ compound Y is :
 [1] $\text{C}_2\text{H}_5\text{OH}$ [2] CH_3COOH [3] $\begin{array}{c} \text{CHO} \\ | \\ \text{CHO} \end{array}$ [4] $\begin{array}{c} \text{CH}_2\text{OH} \\ | \\ \text{CH}_2\text{OH} \end{array}$
- Q.75** Propyne can react with two moles of HCl to form :
 [1] propylidene dichloride [2] isopropylidene dichloride
 [3] ethylidene dichloride [4] butylidene dichloride
- Q.76** Which of the following reagents should be suitable for converting propyne to propanone ?
 [1] Ozone [2] Dilute $\text{H}_2\text{SO}_4 + \text{HgSO}_4$
 [3] Acidified KMnO_4 [4] Dialkylborane followed by alkaline H_2O_2
- Q.77** The ascending order of solubility in water is :
 [1] Ethane < Ethyne < Ethene [2] Ethene < Ethane < Ethyne
 [2] Ethyne < Ethene < Ethane [4] Ethane < Ethene < Ethyne
- Q.78** Acetylene can be prepared from -
 [1] Potassium fumarate [2] Calcium carbide [3] Ethylene bromide [4] All
- Q.79** Mesitylene is obtained by the polymerisation of -
 [1] Propyne [2] Propane [3] Propene [4] None of these
- Q.80** A compound is treated with NaNH_2 to give sodium salt. Identify the compound -
 [1] C_2H_2 [2] C_6H_6 [3] C_2H_6 [4] C_2H_4
- Q.81** Total no. of C-atom in a simplest hydrocarbon molecule containing three acetylenic H-atom -
 [1] 4 [2] 5 [3] 6 [4] 7
- Q.82** Which of the following is formed by the Kolbe's electrolysis of the mixture of potassium salt of maleic acid and fumaric acid -
 [1] $\text{C}_2\text{H}_4 + \text{C}_2\text{H}_2 + \text{CO}_2$ [2] $\text{C}_2\text{H}_2 + \text{C}_2\text{H}_4$ [3] $\text{C}_2\text{H}_2 + \text{CO}_2$ [4] $\text{C}_2\text{H}_4 + \text{CO}_2$

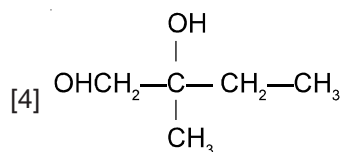
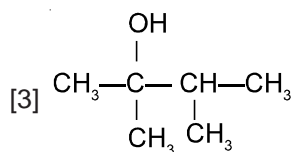
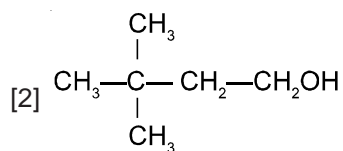
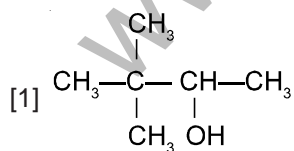
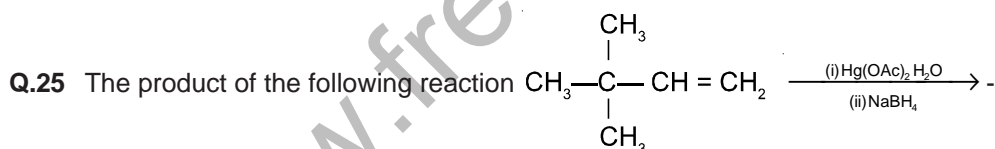
Answer Key

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Qus.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	4	2	3	4	1	3	3	1	4	1	3	2	3	4	1	2	2	3	3	3
Qus.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	2	2	3	1	1	2	3	1	3	3	3	2	3	4	4	3	2	2	2	2
Qus.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	2	3	1	3	3	2	3	1	1	1	2	4	4	4	2	2	4	4	1	1
Qus.	81	82																		
Ans.	4	3																		

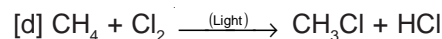
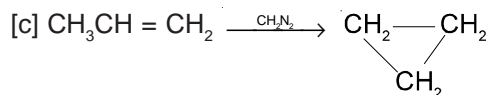
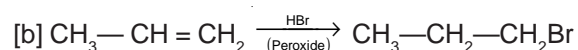
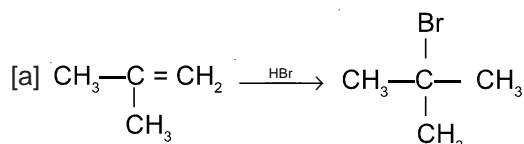
Exercise # 2

- Q.1** The complete combustion of CH_4 gives -
 [1] $\text{CO}_2 + \text{H}_2\text{O}$ [2] $\text{CO}_2 + \text{H}_2$ [3] $\text{CO}_2 + \text{COCl}_2$ [4] $\text{CO} + \text{H}_2\text{O}$
- Q.2** Which hydrocarbon are not formed by the wurtz reaction of ethyl iodide and n-propyl iodide -
 [1] n-Butane [2] n-Heptane [3] n-pentane [4] n-Hexane
- Q.3** Which product is not form in chlorination of CH_4 -
 [1] $\text{CH}_3\text{—Cl}$ [2] $\text{CH}_3\text{—CH}_3$ [3] Cl_2 [4] None of these
- Q.4** What is the required volume of O_2 (lit.) for the complete combustion of 6 gm ethane -
 [1] 6.12 [2] 7.8 [3] 15.68 [4] 22.4
- Q.5** In nitration propane & higher alkane shows -
 [1] Free radical substitution [2] Ionic mechanism [3] Both [4] None
- Q.6** Methane cannot formed by -
 [1] COCl_2 [2] CS_2 [3] CHCl_3 [4] CCl_4
- Q.7** Which compound does not give alkane on reduction with Red P + HI -
 [1] Alcohol [2] Aldehyde & Ketone [3] Acid [4] Acid derivatives
- Q.8** n-heptane on reaction with chromium oxide, then dehydrogenation followed by cyclization gives -
 [1] 1-heptene [2] Benzene [3] o-xylene [4] Methyl benzene
- Q.9** The catalyst used in Ziegler process for polyethylene manufacture -
 [1] Consists of aluminium triethyl and titanium tetrachloride
 [2] Consists of aluminium chloride and titanium dioxide
 [3] Is vanadium pentoxide
 [4] Is finely divided nickel
- Q.10** Baeyer's reagent is used in the laboratory for -
 [1] Reduction process [2] Oxidation process [3] Detection of glucose [4] Detection of double bond
- Q.11** Which one of the following is used to make 'nonstick' cookware -
 [1] Polystyrene [2] Polytetrafluoroethylene [3] Polyethylene [4] None of these
- Q.12** Reaction of isobutylene and conc $\text{H}_2\text{SO}_4 + \text{SO}_3$ gives -
 [1] 2-Methyl propane-2-sulphonic acid [2] t-butyl sulphonic acid
 [3] Both [4] None
- Q.13** The reaction of perbenzoic acid at β -butylene gives -
 [1] 2,3-Butanediol [2] 1,2-Epoxybutane [3] 2,3-Epoxypropane [4] 2,3-Epoxybutane
- Q.14** $\text{CH}_2 = \text{CH}_2 \xrightarrow[\text{CCl}_4]{\text{Br}_2} \text{A} \xrightarrow[\text{(ii) NaNH}_2]{\text{(i) Alc. KOH}} \text{B} \xrightarrow{+2\text{HX}} \text{C}$ in reaction C is -
 [1] Vis dihalide [2] Gem dihalide [3] Gem dibromide [4] α, ω - dihalide
- Q.15** What the main product of addition of "Tildon reagent" at α - butylene -
 [1] 2-Chloro-1-nitrosopropane [2] 1-Chloro-2-nitrosobutane
 [3] 2-chloro-1-nitrosobutane [4] Butane nitrosochloride

- Q.16** What type of compound form by the reaction of diazomethane at methyl ethylene -
 [1] saturated acyclic [2] Saturated homocyclic [3] Homocyclic aromatic [4] Unsaturated homocyclic
- Q.17** The application of ethylene are -
 [A] Formation of Mustard gas [B] Repining of Fruits
 [C] Formation of Lewisite [D] Formation of Glycol
 Correct answer is :
 [1] ABD [2] ABC [3] ACD [4] BCD
- Q.18** $\text{CH}_2 = \text{CH}_2 + \text{H}_2\text{O} \xrightarrow[\text{ClCl}_2]{\text{PdCl}_2} \text{X}$, in reaction X is -
 [1] Acetic acid [2] Ethylene glycol [3] Ethanal [4] Ethylene oxide
- Q.19** Which of the following compound are not used in the "Oxo reaction" of olefins -
 [1] HCHO [2] CO [3] Co [4] H_2
- Q.20** Which olefine is formed on the heating Dimethyl n-propylamine oxide at 150°C -
 [1] Ethene [2] Ethyl ethylene [3] Methyl ethylene [4] Sym. Dimethyl ethylene
- Q.21** Which compound is formed by the oxidation of SeO_2 on ethyl ethylene -
 [1] 2-butene-1-ol [2] 3-butene-2-ol [3] 1-butnen-1-ol [4] 3-butene-1-ol
- Q.22** Koch reaction on propene give -
 [1] Iso valeric acid [2] Isobutyric acid [3] Propionic acid [4] None of these
- Q.23** In Whol's Ziegler reaction which group is substituted by the allylic hydrogen atom of alkene -
 [1] —OH [2] — NH_2 [3] —Br [4] —COOH
- Q.24** Which of the following reagent converts the propene to 1-propanol -
 [1] $\text{H}_2\text{O}, \text{H}_2\text{SO}_4$ [2] aqueous KOH [3] $\text{MgSO}_4, \text{NaBH}_4/\text{H}_2\text{O}$ [4] $\text{B}_2\text{H}_6, \text{H}_2\text{O}_2, \text{OH}^-$



Q.26 Review the following reactions and choose reactions which are completed by free radical mechanism -



Correct answer is :

[1] b, c, d

[2] a, c

[3] a, d

[4] a, b

Q.27 Which of the unsaturated compound react with sodamide -

[1] 2-butyne

[2] 1-butene

[3] 2-buteen

[4] 1-butyne

Q.28 Reagent can apply for the formation of chloroprene from acetylene -

[1] $\text{Cu}(\text{NH}_3)_2$ and HCl

[2] Cu_2Cl_2 and O_2

[3] $\text{Ni}(\text{CO})_4$

[4] $\text{Ni}(\text{CO})_4$ and $(\text{C}_6\text{H}_5)_3\text{P}$

Q.29 $\text{CH}\equiv\text{CH} + \text{CO} + \text{H}_2\text{O} \xrightarrow{\text{Ni}(\text{CO})_4}$ Product, for this reaction which statement is false -

[1] The product of reaction is a α, β -unsaturated acid

[2] In reaction the addition of Hydrogen and carboxylic group at π bond

[3] The product name in this reaction is acrylic acid

[4] The product react with ethyl alcohol give ethyl butanoate

Q.30 $\text{A} \xrightarrow{\text{Electrolysis}} \text{B} \xrightarrow[\text{BF}_3, \text{HgO}]{\text{CH}_3\text{OH}}$ Methylal, [A] is -

[1] Potassium formate

[2] Potassium acetate

[3] Sodium succinate

[4] Sodium fumarate

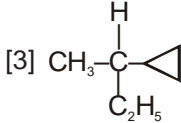
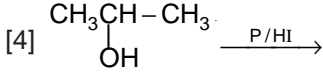
Answer Key

Qus.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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Qus.	21	22	23	24	25	26	27	28	29	30										
Ans.	2	2	3	4	1	1	4	1	4	4										

Exercise # 3

Alkane

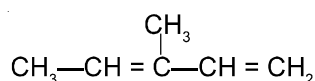
- Q.1** Indicate the expected structure of the organic product when ethyl magnesium bromide is treated with heavy water (D_2O) - **[DCE-1994]**
 [1] $C_2H_5-C_2H_5$ [2] C_2H_5OD [3] C_2H_6 [4] C_2H_5D .
- Q.2** The reagent used for the conversion, $CH_3CH_2COOH \rightarrow CH_3CH_2CH_3$ is - **[DCE-1994]**
 [1] $LiAlH_4$ [2] Soda-lime
 [3] Red P and concentrated HI [4] Amalgamated zinc and concentrated HCl
- Q.3** Liquefied petroleum gas (LPG) mostly contains - **[KCET-1995]**
 [1] Methane [2] Ethane [3] Butane [4] Propane
- Q.4** $C_3H_8 + Cl_2 \xrightarrow{\text{Light}} C_3H_7Cl + HCl$ is an example of which of the following types of reactions - **[RPET-1998]**
 [1] Substitution [2] Elimination [3] Addition [4] Rearrangement
- Q.5** Volume of oxygen is required for total combustion of propane - **[RPET-1998]**
 [1] Five times of propane [2] $2 + 1/2$ times of propane
 [3] 2 times of propane [4] Equal to propane
- Q.6** Alkane is prepared by - **[RPET-1998]**
 [1] Wurtz [2] Reduction to alkyl halide [3] By grignard reagent [4] All the above
- Q.7** Which hydrocarbon is solid at normal temperature - **[RPET-1999]**
 [1] CH_4 [2] C_7H_{16} [3] C_8H_{18} [4] $C_{20}H_{42}$
- Q.8** For the complete combustion of four liters of ethane the necessary volume of oxygen would be - **[RPMT-2000]**
 [1] 4 liters [2] 8 liters [3] 12 liters [4] 14 liters
- Q.9** Which of the following alkanes contains primary, secondary, tertiary and quaternary carbon atoms together- **[MPPMT-2001]**
 [1] $(CH_3)_3CH$ [2] $(C_2H_5)_3CH$ [3] $(CH_3)_3CCH_2CH(CH_3)_2$ [4] $(CH_3)_4C$
- Q.10** On electrolysis of sodium acetate H_2 gas is evolved at cathode, C_2H_6 is at anode. Then reaction is known as - **[RPMT-2001]**
 [1] Frankland [2] Kolbe [3] Clemenson [4] wolf-keishner
- Q.11** C.N.G. is - **[RPMT-2001]**
 [1] CH_4 + Propane + Butane + Higher Alkane (84%) [2] CH_4 + Ethane + Butane (33%) (33%) (33%)
 [3] Benzene + petrol (1) (1) [4] CH_4 + LPG (10%) (90%)
- Q.12** Mustard gas is obtained by - **[RPET-2002]**
 [1] The action of dilute acids on mustard seeds [2] Treating ethylene with mustard oil
 [3] Treating sulphur chloride with ethylene [4] None of these

- Q.13** Butene-1-may be converted to butane by reaction with - [AIEEE-2003]
 [1] Pd/H₂ [2] Zn - HCl [3] Sn - HCl [4] Zn - Hg.
- Q.14** On mixing a certain alkane with chlorine and irradiating it with ultraviolet light, it forms only one monochloroalkane. This alkane could be - [AIEEE-2003]
 [1] neopentane [2] propane [3] pentane [4] isopentane
- Q.15** Which one of the following is reduced with Zn & HCl to give the corresponding hydrocarbon : [AIEEE-2004]
 [1] Butane-2-one [2] Acetic acid [3] Acetamide [4] Ethyl acetate
- Q.16** Amongst the following compounds, the optically active alkane having lowest molecular mass is : [AIEEE-2004]
 [1] CH₃-CH₂-C≡CH [2] CH₃-CH₂-CH(CH₃)-CH₃ [3]  [4] CH₃-CH₂-CH₂-CH₃
- Q.17** Which one of the following has the minimum boiling point : [AIEEE-2004]
 [1] isobutane [2] 1-butyne [3] 1-butene [4] n-butene
- Q.18** Natural gas is mixture of [RPMT-2004]
 [1] H₂O + CO₂ [2] CO + H₂ [3] CH₄ + C₂H₆ + C₃H₈ [4] CO + H₂ + CH₄
- Q.19** Marsh gas contains mainly [RPMT-2004]
 [1] CH₄ [2] C₂H₄ [3] H₂S [4] CO
- Q.20** 2-Methylbutane on reacting on reacting with bromine in the presence of sunlight gives mainly [AIEEE-05]
 [1] 2-bromo-2-methylbutane [2] 1-bromo-2-methylbutane
 [3] 1-bromo-3-methylbutane [4] 2-bromo-3-methylbutane
- Q.21** Which of the following reactions will not give propane ? [DPMT 2005]
 [1] CH₃CH₂CH₂Cl $\xrightarrow[\text{H}_2\text{O}]{\text{Mg/ether}}$ * [2] CH₃COCl $\xrightarrow[\text{H}_2\text{O}]{\text{CH}_3\text{MgX}}$
 [3] CH₃CH=CH₂ $\xrightarrow[\text{CH}_3\text{COOH}]{\text{B}_2\text{H}_6}$ [4]  $\xrightarrow{\text{P/HI}}$
- Q.22** Which of the following is not an endothermic reaction ? [J & K 2005]
 [1] Dehydrogenation [2] Ethane to ethene
 * [3] Combustion of propane [4] Change of chlorine molecule into chlorine atoms
- Q.23** Which of the following contain isopropyl group - [BHU 2005]
 [1] 2,2,3,3-tetramethylpentane * [2] 2-methyl pentane
 [3] 2,2,3-tetramethylpentane [4] 3,3-dimethyl pentane

- Q.24** The product obtained on reaction of C_2H_5Cl with hydrogen over palladium carbon is - [AFMC 2005]
 [1] C_3H_8 [2] C_4H_{10} [3] C_2H_6 [4] C_2H_4

Alkene

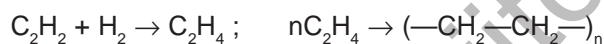
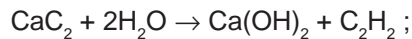
- Q.25** Alkyl halides react with dialkyl copper reagent to give [AIEEE-05]
 [1] alkyl copper halides [2] alkenes [3] alkenyl halides [4] alkanes
- Q.26** Which set of products is expected on reductive ozonolysis of the following olefins - (DCE-1994)



- [1] CH_3CHO ; $CH_3COCH=CH_2$ [2] $CH_3CH=C(CH_3)CHO$; CH_2O
 [3] CH_3CHO ; CH_3COCHO ; CH_2O [4] CH_3CHO ; CH_3COCH_3 ; CH_2O
- Q.27** The product formed by the action of chlorine on ethene in saturated solution of KBr is/are -
 [1] $ClCH_2CH_2Cl + ClCH_2CH_2CH_2Br$ [2] $ClCH_2CH_2Cl$ (Pb. CET-1996)
 [3] $ClCH_2CH_2Cl + BrCH_2CH_2Cl$ [4] $ClCH_2CH_2Cl + BrCH_2CH_2Br + ClCH_2CH_2Br$

- Q.28** When propene is treated with HBr in the dark and in absence of peroxide the main product is -(DCE-1996)
 [1] 1-Bromopropane [2] 2-Bromopropane [3] 1, 2-Dibromopropane [4] 1, 3-Dibromopropane

- Q.29** Formation of polyethene from calcium carbide takes place as follows -



The amount of polythene obtained from 64 kg of CaC_2 is (AIIMS-1997)

- [1] 7 kg [2] 14 kg [3] 21 kg [4] 28 kg
- Q.30** When potassium permanganate ($KMnO_4$) is added to ethylene gives - [MPPET-95, AFMC-1998]
 [1] Glycerol [2] Ethanol [3] Methanol [4] Ethylene glycol

- Q.31** Which of the following is the most stable alkene - [Manipal-94, RPMT-93, AIIMS-98]
 [1] $R_2C=CR_2$ [2] $RCH=CHR$ [3] $CH_2=CHR$ [4] $CH_2=CH_2$

- Q.32** 2-Bromopentane is heated with potassium ethoxide in ethanol. The major product obtained is - [CPMT-1998]
 [1] 1-Pentene [2] cis-2-pentene [3] trans-2-pentene [4] 2-Ethoxypentane

- Q.33** Which alkene gives same product with both Markownikoff's and anti Markownikoff's method - [RPMT-1998]
 [1] α -Butylene [2] Propylene [3] α -amylene [4] β -Butylene

- Q.34** PVC is the polymer of - [RPMT-1998]
 [1] Vinly cyanide [2] Vinly acetate [3] Vinyl chloride [4] Ethylene

- Q.35** A reagent used to test unsaturation in alkene is - [KCET-1999]
 [1] Ammoniacal Cu_2Cl_2 [2] Ammoniacal $AgNO_3$ [3] Solution of Br_2 in CCl_4 [4] Conc. H_2SO_4

Q.36 In the reaction $\text{CH}_2 = \text{CH}_2 \xrightarrow[\text{acid}]{\text{hypochlorous}} \text{M} \xrightarrow{\text{R}} \begin{array}{c} \text{CH}_2\text{OH} \\ | \\ \text{CH}_2\text{OH} \end{array}$ where M = Molecule and R = Reagent M and R are -

[1] $\text{CH}_3\text{CH}_2\text{Cl}$ and NaOH [2] $\text{CH}_2\text{Cl}-\text{CH}_2\text{OH}$ and aq. NaHCO_3 [CPMT-1999]
 [3] $\text{CH}_3\text{CH}_2\text{OH}$ and HCl [4] $\text{CH}_2=\text{CH}_2$ and heat

Q.37 Alkene not showing addition of HBr according to Anti-Markownikoffs rule is - [RPET-96, RPMT-99]
 [1] 2-Pentene [2] 2-Butene [3] 1-Butene [4] Propene

Q.38 $\text{CH}_3-\text{CH}=\text{CH}_2 \xrightarrow{\text{HBr}} \text{A}$, Here product A is - [RPMT-1999]
 [1] $\text{BrCH}_2-\text{CH}=\text{CH}_2$ [2] $\text{CH}_3-\text{CH}_2-\text{CH}_2\text{Br}$ [3] $\text{CH}_3-\text{CH}(\text{Br})-\text{CH}_3$ [4] $\text{Br}-\text{CH}_2-\text{CH}_2\text{CH}_2\text{Br}$

Q.39 Ethene is given by the following compound on dehydration - [RPET-1999]
 [1] Ethyl acetate [2] $\text{C}_2\text{H}_5\text{OH}$ [3] HCHO [4] 1 and 2

Q.40 The compound which gives only acetaldehyde on ozonolysis is - [MPPET-2000]
 [1] Butene-1 [2] Butene-2 [3] Ethylene [4] Propylene

Q.41 Which of the following reagent is used in formation of alkene from alkyl halide - [RPMT-2000]
 [1] Alc. KOH + Heat [2] Aq. KOH + cold water [3] NaOH [4] LiOH

Q.42 Ethene react with bromine form - [MPPMT-2001]
 [1] $\text{Br}-\text{CH}_2-\text{CH}_3$ [2] CH_3-CBr_3 [3] $\text{Br}-\text{CH}_2-\text{CH}_2-\text{Br}$ [4] CHBr_3

Q.43 Favourable conditions of the polymerisation of ethene is - [RPET-2001]
 [1] Only high temperature [2] Only catalyst
 [3] Only high pressure [4] High temperature and High pressure

Q.44 $6\text{CH}_2 = \text{CH}_2 + \text{B}_2\text{H}_6 \rightarrow 2\left(\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{H}-\text{C}-\text{C}- \\ | \quad | \\ \text{H} \quad \text{H} \end{array}\right)_3\text{B}$ - [RPET-2001]

Product is base of formation of organo-boron compound. It was prepared by scientist

[1] Brown & Benzamine [2] Brown & Zweifel [3] Brown & Metheson [4] Brown & Supparoev

Q.45 1, 3-pentadiene is more stable then -1, 4-pentadiene because of - [RPET-2001]
 [1] It is conjugated diene [2] It has more dipole moment
 [3] Both are functional & position isomer [4] None

Q.46 Monomer of $\left[\begin{array}{c} \text{CH}_3 \\ | \\ -\text{C}-\text{CH}_2- \\ | \\ \text{CH}_3 \end{array} \right]_n$ is - [CBSE-2002]

[1] 2-Methyl propene [2] Styrene [3] Propylene [4] Ethene

- Q.47** The reaction : [MPPMT-2002]
- $$\text{CH}_3\text{CH}=\text{CH}_2 \xrightarrow[\text{H}^+]{\text{CO} + \text{H}_2\text{O}} \text{CH}_3-\underset{\text{COOH}}{\text{CH}}-\text{CH}_3 \text{ is known as -}$$
- [1] Wurtz reaction [2] Koch reaction [3] Clemensen reduction [4] Kolbe's reaction
- Q.48** General formulae of alkenes and alkyl radicals are respectively - [MPPMT-2002]
- [1] C_nH_{2n} and $\text{C}_n\text{H}_{2n+1}$ [2] C_nH_{2n} and $\text{C}_n\text{H}_{2n+1}$ [3] $\text{C}_n\text{H}_{2n-1}$ and C_nH_{2n} [4] $\text{C}_n\text{H}_{2n+1}$ and $\text{C}_n\text{H}_{2n+2}$
- Q.49** Correct position of double bond in alkene is identified with - [RPET-2002]
- [1] Hydrogenation [2] Ozonolysis [3] Baeyer's reagent [4] Dehydration
- Q.50** Reaction of HBr with propane in the presence of peroxide gives [CPMT Scr. 2004]
- [1] 3-bromo propane [2] allyl bromide [3] n-propyl bromide [4] isopropyl pentachloride
- Q.51** Which of the following reaction will give maximum yield of $\text{C}_2\text{H}_5\text{Cl}$ [RPMT-2004]
- [1] $\text{C}_2\text{H}_6 + \text{Cl}_2 \xrightarrow[\text{(excess)}]{\text{hv. light}} \text{C}_2\text{H}_5\text{Cl} + \text{HCl}$ [2] $\text{C}_2\text{H}_6 + \text{Cl}_2 \xrightarrow[\text{(excess)}]{\text{hv. light}} \text{C}_2\text{H}_5\text{Cl} + \text{HCl}$
- [3] $\text{C}_2\text{H}_6 \xrightarrow{\text{hv. light}} \text{C}_2\text{H}_5\text{Cl}$ [4] $\text{C}_2\text{H}_6 \xrightarrow[\text{excess}]{\text{hv. light}} \text{C}_2\text{H}_5\text{Cl} + \text{HCl}$
- Q.52** A compound 'X' gives two moles of HCHO on ozonolysis then is [RPMT-2004]
- [1] C_2H_5 [2] C_2H_4 [3] C_2H_6 [4] C_6H_6
- Q.53** A compound decolourises KMnO_4 but does not gives amm. AgNO_3 ppt test [RPMT-2004]
- [1] CH_3COCH_3 [2] C_3H_6 [3] C_2H_4 [4] C_2H_2
- Q.54** Reduction of Alkene under a catalyst is called as [RPMT-2004]
- [1] Markoni-koff's rule [2] Frankland reaction [3] Wurtz reaction [4] Sabtier-Senderence reaction
- Q.55** Reaction of one molecule of HBr with one molecule of 1,3-butene at 40°C gives predominantly [AIEEE-05]
- [1] 1-bromo-2-butene under thermodynamically controlled conditions
- [2] 3-bromobutene under kinetically controlled conditions
- [3] 1-bromo-2-butene under kinetically controlled conditions
- [4] 3-bromobutene under thermodynamically controlled conditions
- Q.56** Acid catalyzed hydration of alkenes except ethene leads to the formation of [AIEEE-05]
- [1] secondary or tertiary alcohol [2] primary alcohol
- [3] mixture of secondary and tertiary alcohols [4] mixture of primary and secondary alcohols
- Q.57** Elimination of bromine from 2-bromobutane results in the formation of [AIEEE-05]
- [1] predominantly 2-butene [2] equimolar mixture of 1 and 2-butene
- [3] predominantly 2-butyne [4] predominantly 1-butene
- Q.58** Which of these does not follow Anti-Markownikoff's rule [Orissa JEE 2005]
- [1] 2-butene [2] 1-butene [3] 2-pentene [4] 2-hexene

- Q.59** Which of the following react with KMnO_4 but does not react with AgNO_3 ? [BCECE 2005]
 [1] C_2H_6 [2] CH_4 [3] C_2H_4 [4] C_2H_2
- Q.60** 3-Phenylpropene on reaction with HBr gives (as a major product) [AIIMS 2005]
 [1] $\text{C}_6\text{H}_5\text{CH}_2\text{CH}(\text{Br})\text{CH}_3$ [2] $\text{C}_6\text{H}_5\text{CH}(\text{Br})\text{CH}_2\text{CH}_3$ [3] $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{CH}_2\text{Br}$ [4] $\text{C}_6\text{H}_5\text{CH}(\text{Br})\text{CH}=\text{CH}_2$
- Q.61** The only alcohol that can be prepared by the indirect hydration of alkene is - [AFMC 2005]
 [1] Ethyl alcohol [2] Propyl alcohol [3] Isobutyl alcohol [4] Methyl alcohol
- Q.62** The reaction of HBr with $\text{CH}_3-\overset{\text{CH}_3}{\text{C}}=\text{CH}_2$ in the presence of peroxide will give - [BHU 2005]
 [1] $\text{CH}_3\overset{\text{CH}_3}{\text{C}}\text{BrCH}_3$ [2] $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{Br}$ [3] $\text{CH}_3\overset{\text{CH}_3}{\text{C}}\text{HCH}_2\text{Br}$ [4] $\text{CH}_3\overset{\text{CH}_3}{\text{C}}\text{HCH}_2\text{CH}_3$
- Q.63** A gas decolourised by KMnO_4 solution but gives no precipitate with ammoniacal cuprous chloride is - [KCET 2005]
 [1] Ethane [2] Methane [3] Ethene [4] Acetylene
- Q.64** Cyclohexene on reaction with OsO_4 followed by reaction with NaHSO_3 gives [Orissa JEE 2005]
 [1] cis-diol [2] trans-diol [3] epoxy [4] alcohol
- Q.65** Find the final product ; $\text{CH}_3-\text{CH}=\text{CH}_2+\text{NOCl} \longrightarrow ?$ [IIT 2006]
 [1] $\text{H}_3\text{C}-\overset{\text{Cl}}{\text{C}}-\overset{\text{NO}}{\text{C}}-\text{H}$ [2] $\text{H}_3\text{C}-\overset{\text{NO}}{\text{C}}-\overset{\text{Cl}}{\text{C}}-\text{H}$ [3] $\text{ON}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{Cl}$ [4] $\text{H}_3\text{C}-\overset{\text{H}_3\text{C}}{\text{C}}-\overset{\text{Cl}}{\text{C}}-\overset{\text{NO}}{\text{C}}-\text{H}$

Alkyne

- Q.66** When acetylene is hydrated in the pressure of 42% H_2SO_4 containing mercuric sulphate at 330-370, the product obtained is - [AFMC-94,RPMT-1998]
 [1] Acetone [2] Acetaldehyde [3] Isopropyl alcohol [4] n-Propyl aldehyde
- Q.67** A compound $\text{X}(\text{C}_5\text{H}_8)$ reacts with ammoniacal AgNO_3 to give a white precipitate, and on oxidation with hot alkaline KMnO_4 gives the acid, $(\text{CH}_3)_2\text{CHCOOH}$. Therefore X is - (AIIMS-1994)
 [1] $\text{CH}_2=\text{CHCH}=\text{CHCH}_3$ [2] $\text{CH}_3\text{CH}=\text{CHCH}_2\text{CH}_3$ [3] $(\text{CH}_3)_2\text{CH}-\text{C}\equiv\text{CH}$ [4] $(\text{CH}_3)_2\text{C}=\text{C}=\text{CH}_2$
- Q.68** When an alkyne, $\text{RC}\equiv\text{CH}$, is treated with cuprous ion in an ammoniacal medium, one of the products is - (DCE-1996)
 [1] $\text{RC}\equiv\text{CCu}$ [2] $\text{CuC}\equiv\text{CH}$ [3] $\text{CuC}\equiv\text{CCu}$ [4] $\text{RC}=\text{CR}$
- Q.69** Acetylene on reacting with ammoniacal AgNO_3 gives - [CPMT-1998]
 [1] Silver mirror [2] Silver metal [3] Silver acetate [4] Silver acetylide
- Q.70** An unknown compound A has molecular formula C_4H_6 . When A is treated with excess of Br_2 a new substance B with formula $\text{C}_4\text{H}_6\text{Br}_4$ is formed. A forms a white ppt. with ammoniacal silver nitrate solution. A may be - [MPPMT-1998]
 [1] But-1-yne [2] But-2-yne [3] But-1-ene [4] But-2-ene

- Q.71** In the reaction $\text{CH}_3-\text{C}\equiv\text{C}-\text{CH}_3 \xrightarrow[\text{(ii)H}_2\text{O}]{\text{(i)X}} \text{CH}_3-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-\text{CH}_3$, X is - [MPPET-1998]
- [1] HNO_3 [2] O_2 [3] O_3 [4] KMnO_4
- Q.72** The compound formed by the reaction of simplest alkyne with excess of bromine is - [RPMT-1998]
- [1] Acetylene dibromide [2] Acetylene tetrabromide
[3] Vinyl bromide [4] All these above
- Q.73** Which compound is formed by the reaction of one mole acetylene and two mole hypochlorous acid - [RPMT-1998]
- [1] Chloral [2] Dichloro acetaldehyde [3] Dichloro acetone [4] Both 1 & 2
- Q.74** In which of the following hydrocarbons, hydrogen is most acidic - [AFMC-2000,99]
- [1] C_6H_6 [2] $\text{CH}_2 = \text{CH}_2$ [3] $\text{CH}\equiv\text{CH}$ [4] CH_3-CH_3
- Q.75** Mesitylene is the addition polymer of compound - [RPMT-1999]
- [1] Acetone [2] Propene [3] Propyne [4] Acetylene
- Q.76** Which one of following react with HOCl to form $\text{CH}_3-\text{CO}-\text{CHCl}_2$ product - [RPMT-1999]
- [1] $\text{CH}_3-\text{C}\equiv\text{C}-\text{CH}_3$ [2] $\text{CH}_3-\text{C}\equiv\text{CH}$ [3] $\text{CH}\equiv\text{CH}$ [4] $\text{CH}_3-\text{CH}_2-\text{C}\equiv\text{CH}$
- Q.77** Two mole of HBr is added with $\text{CH}_3-\text{C}\equiv\text{CH}$ in presence of peroxide to give - [RPMT-1999]
- [1] $\text{CH}_3-\text{CH}_2-\text{CHBr}_2$ [2] $\text{CH}_3-\text{CH}(\text{Br})-\text{CH}_2\text{Br}$ [3] $\text{CH}_3-\text{CBr}_2-\text{CH}_3$ [4] $\text{CH}_3-\text{CH}_2\text{Br}-\text{CHBr}_2$
- Q.78** Tollen's reagent is - [RPMT-1999]
- [1] Solution of CuSO_4 [2] Ammoniacal AgNO_3 solution
[3] Anhydrous ZnCl_2 [4] Fuccine
- Q.79** If mixture of $\text{CH}\equiv\text{CH}$ & N_2 is passed electric spark to give - [RPMT-1999]
- [1] Ether [2] Ethylamine [3] HCN [4] NH_3
- Q.80** Benzene is a polymer of - [RPET-1999]
- [1] Ethyne [2] Ethylene [3] Methane [4] Ethane
- Q.81** Compound 'C' can be distinguished from the other three compounds by the reagent - [MPPET-2000]
- (A) $\text{CH}_3\text{C}\equiv\text{C}-\text{CH}_3$ (B) $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_3$ (C) $\text{CH}_3\text{CH}_2\text{C}\equiv\text{CH}$ (D) $\text{CH}_3\text{CH}=\text{CH}_2$
- [1] Bromine in CCl_4 [2] Bromine in acetic acid [3] Alkaline KMnO_4 [4] Ammoniacal silver nitrate
- Q.82** Chloroform, on warming with Ag powder, gives - [RPET-99, BHU-2000]
- [1] C_2H_2 [2] C_2H_4 [3] C_2H_6 [4] C_6H_6
- Q.83** Ammoniacal solution of cuprous chloride give red precipitate with - [AIIMS-2000]
- [1] $\text{H}-\text{C}\equiv\text{C}-\text{CH}_3$ [2] $\text{CH}_2 = \text{CH}_2$ [3] $(\text{C}_2\text{H}_5)_2\text{C}=\text{CH}_2$ [4] $\text{CH}_3-\text{C}\equiv\text{C}-\text{C}_2\text{H}_5$
- Q.84** Alkynes mainly shows - [RPMT-2000]
- [1] Polymerisation [2] Electrophilic addition [3] Free radical substitution [4] All of the above
- Q.85** $\text{HC}\equiv\text{CH} \xrightarrow[\text{H}_2\text{SO}_4]{\text{Hg}^{2+}} \text{A} \xrightarrow[\text{H}_2\text{O}]{\text{CH}_3\text{MgX}} \text{B} \xrightarrow{\text{O}} \text{C}$, Identify the product C in series - [RPMT-2000]
- [1] Ethyl alcohol [2] Acetone [3] Isopropyl alcohol [4] Acetaldehyde
- Q.86** Which of the following acidity order is correct - [RPET-2000]
- [1] 1-Alkyne > Alkene > Alkane [2] Alkene > Alkane > 1-Alkyne
[3] Alkane > Alkene > 1-Alkyne [4] None of these
- Q.87** But-1-ene and propyne are distinguished by - [RPET-2002]
- [1] Baeyers reagent [2] Hinsbergs reagent [3] Tollen's reagent [4] None
- Q.88** When $\text{CH}_3\text{CH}_2\text{CHCl}_2$ is treated with NaNH_2 the product formed is - [CBSE-2002]
- [1] $\text{CH}_3-\text{CH} = \text{CH}_2$ [2] $\text{CH}_3-\text{C}\equiv\text{CH}$ [3] $\text{CH}_3\text{CH}_2\text{CH}(\text{NH}_2)_2$ [4] $\text{CH}_3\text{CH}_2\text{CHCl}(\text{NH}_2)$

- Q.89** With sodium, liberation of hydrogen gas is possible with the following hydrocarbon - [RPMT-2002]
 [1] CH_4 [2] C_2H_6 [3] C_2H_4 [4] C_2H_2
- Q.90** Hydrocarbon 'A' of molecular formula C_5H_8 gives white precipitate with ammoniacal AgNO_3 solution. 'A' on treatment with acidified $\text{K}_2\text{Cr}_2\text{O}_7$ produces acid of the formula $(\text{CH}_3)_2\text{CHCOOH}$. Hence the compound 'A' is - [RPMT-2002]
 [1] $(\text{CH}_3)_2\text{CH}-\text{CH}=\text{CH}_2$ [2] $\text{CH}_3-\text{CH}=\text{CH}-\text{CH}=\text{CH}_2$
 [3] $(\text{CH}_3)_2\text{CH}-\text{C}\equiv\text{CH}$ [4] $\text{CH}_3\text{CH}_2\text{CH}_2-\text{C}\equiv\text{CH}$
- Q.91** Which of these will not react with acetylene - [AIEEE-2002]
 [1] NaOH [2] ammoniacal AgNO_3 [3] Na [4] HCl
- Q.92** What is the product formed when acetylene reacts with hypochlorous acid - [AIEEE-2002]
 [1] CH_3COCl [2] ClCH_2CHO [3] Cl_2CHCHO [4] ClCH_2COOH
- Q.93** Products of the following reaction $\text{CH}_3\text{C}\equiv\text{CCH}_2\text{CH}_3 \xrightarrow[\text{(2)Hydrolysis}]{\text{(1)O}_3}$ are [CBSE PMT 2005]
 [1] $\text{CH}_3\text{CHO} + \text{CH}_3\text{CH}_2\text{CHO}$ [2] $\text{CH}_3\text{COOH} + \text{CH}_3\text{CH}_2\text{CHO}$
 [3] $\text{CH}_3\text{COOH} + \text{HOOCCH}_2\text{CH}_3$ [4] $\text{CH}_3\text{COOH} + \text{CO}_2$
- Q.94** $\begin{array}{c} \text{CH} \\ ||| \\ \text{CH} \end{array}$ reacts with acetic acid in presence of Hg^{2+} to give - [BHU 2005]
 [1] $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}(\text{CH}_3\text{COO})_2 \end{array}$ [2] $\begin{array}{c} \text{CH}(\text{CH}_3\text{COO})_2 \\ | \\ \text{CH}(\text{CH}_3\text{COO})_2 \end{array}$ [3] $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_2(\text{CH}_3\text{COO}) \end{array}$ [4] None of these
- Q.95** Which reacts with ammoniacal AgNO_3 [Orissa JEE 2005]
 [1] Propyne [2] 2-butyne [3] 1,3-butadiene [4] Pentene
- Q.96** $\text{CH}\equiv\text{CH} \xrightarrow[\text{H}_2\text{SO}_4]{\text{HgSO}_4} \xrightarrow[\text{H}_2\text{O}]{\text{CH}_3\text{MgBr}} \xrightarrow{\text{P/Br}_2}$ [DPMT 2005]
 [1] $\text{CH}_3\text{CH}(\text{Br})\text{CH}_3$ [2] $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$ [3] $\text{CH}_2=\text{CH}-\text{Br}$ [4] $\text{BrCH}=\text{CH}-\text{CH}_3$
- Q.97** Carbide, which react with water to give propyne is - [Kerala CET 2005]
 [1] CaC_2 [2] SiC [3] Mg_2C_3 [4] Al_4C_3
- Q.98** Which of the following reactions will yield 2,2-dibromopropane? [AIEEE 2007]
 [1] $\text{CH}\equiv\text{CH} + 2\text{HBr} \longrightarrow$ [2] $\text{CH}_3-\text{CH}=\text{CH}_2 + \text{HBr} \longrightarrow$
 [3] $\text{CH}_3-\text{C}\equiv\text{CH} + 2\text{HBr} \longrightarrow$ [4] $\text{CH}_3\text{CH}=\text{CHBr} + \text{HBr} \longrightarrow$

Answer Key

Qus.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	4	3	3	1	1	4	4	4	3	2	1	3	1	1	1	3	1	3	1	1
Qus.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	2	3	2	3	4	3	3	2	4	4	1	3	4	3	3	2	2	3	2	2
Qus.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	1	3	4	1	1	1	2	1	2	3	1	2	3	4	4	1	1	1	3	2
Qus.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	1	3	3	1	2	2	3	1	4	1	3	2	2	3	3	2	2	2	3	1
Qus.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98		
Ans.	4	1	1	2	2	1	3	2	4	3	1	3	3	1	1	1	3	3		

EXERCISE # 3

- Q.1.** $\text{CH}_2 = \text{CH}_2$ reacts with HCl to form :
- (1) $\text{ClCH} = \text{CH} - \text{Cl}$ (2) $\begin{array}{c} \text{CH}_2 - \text{CH}_2 \\ | \\ \text{Cl} \end{array}$ (3) $\text{CH}_2\text{Cl} - \text{CH}_2\text{Cl}$ (4) CH_3CHCl_2
- Q.2** Hydrocarbon containing following bond is most reactive towards electrophile ?
- (1) $\text{C} \equiv \text{C}$ (2) $\text{C} = \text{C}$ (3) $\text{C} - \text{C}$ (4) All
- Q.3** Ethylene reacts with alkaline KMnO_4 (Baeyer's reagent) to form :
- (1) Oxalic acid (2) Acetic acid (3) Glycol (4) Glycerol
- Q.4** On cracking of petrol, we get :
- (1) CH_4 (2) C_3H_6
 (3) Both of the above (4) $\text{CH}_3 + \text{CH}_4 + \text{C}_2\text{H}_6 + \text{alcohols}$
- Q.5** When propylene reacts with hydrogen bromide in the presence of peroxide, the product formed is :
- (1) n-Propyl alcohol (2) Propylene peroxide (3) n-Propyl bromide (4) 1, 3-dibromo propane
- Q.6** Cyclopentene on treatment with alkaline KMnO_4 gives :
- (1) Cyclopentanol
 (2) Trans-1, 2-cyclopentanediol
 (3) Cis-1, 2-cyclopentanediol
 (4) 1 : 1 mixture of cis- and trans-1, 2-cyclopentanediol
- Q.7** Photochemical chlorination of alkane is initiated by a process of :
- (1) Pyrolysis (2) Substitution (3) Homolysis (4) Peroxidation
- Q.8** Ethylene from ethyl bromide is obtained by treating it with -
- (1) Hydrogen (2) Alcoholic caustic potash
 (3) Aqueous caustic potash (4) Aqueous caustic soda
- Q.9** The acetylene molecule contains :
- (1) 5 sigma bonds (2) 4 sigma and 1 pi bonds
 (3) 3 sigma and 2 pi bonds (4) 2-sigma and 3 pi bonds
- Q.10** Ethylene can be prepared by electrolysis of an aqueous solution of :
- (1) Sodium acetate (2) Sodium succinate (3) Sodium fumarate (4) Sodium propionate
- Q.11** Ethyl alcohol is heated with conc. H_2SO_4 . The product formed is :
- (1) $\text{H}_3\text{C} - \overset{\text{O}}{\parallel}{\text{C}} - \text{OC}_2\text{H}_5$ (2) C_2H_6 (3) C_2H_4 (4) C_2H_2
- Q.12** Ethylene readily undergoes the following type of reaction :
- (1) Addition (2) Substitution (3) Elimination (4) Rearrangement
- Q.13** Lead tetraethyl is used as :
- (1) Fire extinguisher (2) Pain killer (3) Petroleum additive (4) Mosquito repellent

- Q.14** Which of the following types of reactions occur when a reactant has got a double bond ?
 (1) Addition (2) Photolysis (3) Substitution (4) Polymerization
- Q.15** Formation of alkane by action of Zn on alkyl halide is called :
 (1) Frankland reaction (2) Cannizzaro's reaction
 (3) Wurtz reaction (4) Kolbe's reaction
- Q.16** Which one of the following organic compounds decolourizes an alkaline KMnO_4 solution :
 (1) CS_2 (2) C_3H_6 (3) C_3H_8 (4) CH_3OH
- Q.17** The following reaction is an example of :

$$\text{C}_3\text{H}_8 + 2\text{Cl}_2 \xrightarrow{\text{Light}} \text{C}_3\text{H}_6\text{Cl}_2 + 2\text{HCl}$$
 (1) An addition reaction (2) A substitution reaction
 (3) An oxidation reaction (4) Elimination reaction
- Q.18** Acetylene reacts with HCl to produce :
 (1) 1, 1-dichloroethane (2) 1, 2-dichloroethane
 (3) 1, 1, 1-trichloroethane (4) None of the foregoing
- Q.19** Conjugated double bond is present in :
 (1) Propylene (2) Isobutylene (3) Butadiene (4) Butylene
- Q.20** A compound "X" on ozonolysis forms two molecules of HCHO. "X" is :
 (1) C_2H_6 (2) C_2H_2 (3) C_2H_4 (4) C_6H_6
- Q.21** Polymerization of acetylene leads to the formation of :
 (1) Benzene (2) Butane (3) Naphthalene (4) Octane
- Q.22** Petroleum consists mainly of :
 (1) Aliphatic hydrocarbons (2) Aromatic hydrocarbons
 (3) Aliphatic alcohols (4) None of the above
- Q.23** By coal-tar distillation which is not obtained :
 (1) Light oil (2) Middle oil (3) Heavy oil (4) Mobil oil
- Q.24** Acidic hydrogen is present in :
 (1) Ethyne (2) Ethene (3) Benzene (4) Ethane
- Q.25** Highest boiling point is expected for :
 (1) Isooctane (2) n-octane
 (3) 2, 2, 3, 3-tetra methyl butane (4) n-Butane
- Q.26** Which of the following represents the most oxidised form of hydrocarbon $\text{R} - \text{CH}_3$:
 (1) CO_2 (2) RCHO
 (3) RCOOH (4) RCO.OOH
- Q.27** Formation of ethylene from ethyl bromide is a case of :
 (1) Addition reaction (2) Substitution reaction
 (3) Elimination reaction (4) Rearrangement reaction

- Q.28** Acetylene reacts with 42% H_2SO_4 containing 1% HgSO_4 to give :
 (1) $\text{C}_2\text{H}_3\text{HSO}_4$ (2) CH_3CHO (3) HCHO (4) $\text{CH}_2 = \text{CH}_2$
- Q.29** Electrolysis of cold concentrated aqueous solution of potassium succinate yields :
 (1) Ethane (2) Ethyne (3) Ethene (4) Ethane-1, 2-diol
- Q.30** Acetylene reacts with ammoniacal AgNO_3 forming :
 (1) Silver mirror (2) Metal silver (3) Silver acetate (4) Silver acetylide
- Q.31** The products of oxidative ozonolysis of an unsymmetrical alkene are :
 (1) alcohol and/or acids (2) aldehydes and/or acids
 (3) ketones and/or acids (4) aldehydes and/or ketones
- Q.32** The order of reactivity of halogens in substitution reaction in polar protic solvent is :
 (1) $\text{F} > \text{Cl} > \text{Br} > \text{I}$ (2) $\text{I} > \text{Br} > \text{Cl} > \text{F}$
 (3) $\text{F} > \text{Br} > \text{Cl} > \text{I}$ (4) $\text{F} > \text{Cl} = \text{Br} > \text{I}$
- Q.33** Propyne and propene can be distinguished by :
 (1) Conc. H_2SO_4 (2) Br_2 in CCl_4 (3) Dilute KMnO_4 (4) AgNO_3 in Ammonia
- Q.34** The reaction of propene with HOCl proceeds via the addition of :
 (1) H^+ in the first step (2) Cl^+ in the first step
 (3) OH^- in the first step (4) Cl^- and OH^- in a single step
- Q.35** In the presence of peroxide, hydrogen chloride and hydrogen iodide don't give anti Markonikov's addition to alkene because :
 (1) both are highly ionic
 (2) one is oxidising and other is reducing
 (3) one of the steps is endothermic in both the case
 (4) all the steps are exothermic in both the case
- Q.36** $\text{CH}\equiv\text{CH} \xrightarrow{\text{O}_3/\text{NaOH}} \text{X} \xrightarrow{\text{Zn}/\text{CH}_3\text{COOH}} \text{Y}$ compound Y is :
 (1) $\text{C}_2\text{H}_5\text{OH}$ (2) CH_3COOH (3) $\begin{array}{c} | \\ \text{CHO} \end{array}$ (4) $\begin{array}{c} \text{CH}_2\text{OH} \\ | \\ \text{CH}_2\text{OH} \end{array}$
- Q.37** $2\text{CH}_4 + \text{O}_2 \xrightarrow[200^\circ\text{C}, 100\text{ atm}]{\text{copper-tube}}$ Product is :
 (1) Formaldehyde and H_2 (2) Acetic acid
 (3) Carbondioxide (4) Methanol
- Q.38** Which of the following compounds should undergo chlorination faster than the remaining three ?
 (1) n-Pentane (2) Neopentane (3) Isopentane (4) n-Butane
- Q.39** Which of the following alkanes should have lower boiling point ?
 (1) Triptane (2) Isoheptane (3) Neoheptane (4) n-Heptane
- Q.40** Which of the following reagents cannot be used for preparing an alkane from a ketone ?
 (A) $\text{Zn}/\text{Hg} + \text{conc. HCl}$ (B) $\text{Red P} + \text{I}_2$
 (C) H_2NNH_2 and $\text{C}_2\text{H}_5\text{ONa}$ (D) NaBH_4
 (1) A and B (2) A and C (3) B and D (4) C and D

- Q.41** Which of the following is the principal constituent present in liquefied petroleum gas (L.P.G) ?
 (1) Propane (2) n-Butane (3) Ethane (4) Methane
- Q.42** The main constituents of calor gas are :
 (1) Methane + Ethane (2) Isobutane + n-Butane
 (3) Propane + n-Butane (4) Methane + Ethane + Propane
- Q.43** Which of the following gases is present as chief constituent in fire damp ?
 (1) CO (2) CH₄ (3) C₂H₂ (4) H₂S
- Q.44** Methane reacts with chlorine in direct sunlight to form :
 (1) C + HCl (2) CCl₄ + HCl (3) CHCl₃ + HCl (4) CH₃Cl + HCl
- Q.45** Which of the following processes is suitable for converting methanoic acid to a paraffin ?
 (1) Electrolysis of sodium salt (2) Reduction with red P + HI
 (3) Decarboxylation (4) Reduction with LiAlH₄
- Q.46** How much air should be required for complete combustion of 44 grams of propane at normal temperature and pressure ?
 (1) 25L (2) 15 L (3) 25 moles (4) 10 moles
- Q.47** Which of the following can be used for the preparation of an alkane ?
 (1) Reduction of an alkyl halide
 (2) Reaction of a Grignard reagent with a compound having reactive hydrogen atom
 (3) Reduction of a ketone
 (4) All of the above
- Q.48** Which of the following cannot give ethene on pyrolysis ?
 (1) Ethane (2) Propane (3) Ethyl acetate (4) Isobutane
- Q.49** Hydroxylation of alkenes cannot be achieved by :
 (1) Baeyer's reagent (2) osmium tetroxide
 (3) dilute KMnO₄ solution (4) acid permanganate
- Q.50** An alkene is not formed on the reaction of zinc dust with :
 (1) a *gem* dibromide (2) a *vic* dibromide
 (3) vinyl bromide (4) isopropylidene dibromide
- Q.51** Polymerisation of vinyl acetate is used for the preparation of :
 (1) a plastic (2) an adhesive (3) a fibre (4) a rubber
- Q.52** A war gas can be prepared from an aliphatic hydrocarbon by the reaction of :
 (1) AsCl₅ (2) S₂Cl₂ (3) SCl₂ (4) As₂O₃
- Q.53** Which of the following catalysts is regarded as most appropriate for polymerisation of propylene ?
 (1) (CH₃)₃Al + AlCl₃ (2) (C₂H₅)₃Al + TiCl₄ (3) Al₂O₃ + CH₃Cl (4) AlBr₃ + HBr

- Q.54** Markownikoff rule does not apply on the addition of HX on the following alkene ?
 (1) 1-Butene (2) 3-Hexene (3) Propene (4) 1-Pentene
- Q.55** Which of the following is not a gas at room temperature ?
 (1) Propane (2) Ethylene (3) n-Pentane (4) Ethane
- Q.56** Which of the following is known as Lindlar's catalyst ?
 (1) $R_3Al + TiCl_4$ (2) $Pd/CaCO_3 + Quinoline + Lead\ acetate$
 (3) $Pd/BaSO_4 + CaCO_3$ (4) $Mg/Hg + H_2$
- Q.57** Propyne can react with two moles of HCl to form :
 (1) propylidene dichloride (2) isopropylidene dichloride
 (3) ethylidene dichloride (4) butylidene dichloride
- Q.58** Which of the following reagents should be suitable for converting propyne to propanone ?
 (1) Ozone (2) Dilute $H_2SO_4 + HgSO_4$
 (3) Acidified $KMnO_4$ (4) Dialkylborane followed by alkaline H_2O_2
- Q.59** The ascending order of solubility in water is :
 (1) Ethane < Ethyne < Ethene (2) Ethene < Ethane < Ethyne
 (3) Ethyne < Ethene < Ethane (4) Ethane < Ethene < Ethyne
- Q.60** The polymer of acrylonitrile is :
 (1) terylene (2) orlon (3) PVC (4) bakelite

ANSWER KEY

EXERCISE # 1

Qus.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	2	2	3	3	3	3	3	2	3	2	3	1	3	1	1	2	2	1	1	1
Qus.	21	22	23	24	25	26	27	28	29	30										
Ans.	1	1	4	1	2	1	3	2	3	4										

Qus.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	3	2	4	2	3	4	4	3	1	3	1	2	2	1	2	3	4	4	4	3
Qus.	21	22	23	24	25	26	27	28	29	30										
Ans.	2	2	2	2	3	2	2	2	4	2										

EXERCISE # 2

- 1 But-1-ene and propyne are distinguished by - [RPET-2002]
 [1] Baeyerss reagent [2] Hinsbergs reagent [3] Tollen's reagent [4] None
- 2 Monomer of $\left[\begin{array}{c} \text{CH}_3 \\ | \\ \text{---C---CH}_2\text{---} \\ | \\ \text{CH}_3 \end{array} \right]_n$ is - [CBSE-2002]
 [1] 2-Methyl propene [2] Styrene [3] Propylene [4] Ethene
- 3 The reaction : [MPPMT-2002]

$$\text{CH}_3\text{CH}=\text{CH}_2 \xrightarrow[\text{H}^+]{\text{CO} + \text{H}_2\text{O}} \text{CH}_3\text{---}\underset{\text{COOH}}{\text{CH}}\text{---CH}_3$$
 is known as -
 [1] Wurtz reaction [2] Koch reaction [3] Clemensen reeduction [4] Kolbe's reaction
- 4 General formulae of akenes and alkyl radicals are respectively - [MPPMT-2002]
 [1] C_nH_{2n} and $\text{C}_n\text{H}_{2n-1}$ [2] C_nH_{2n} and $\text{C}_n\text{H}_{2n+2}$ [3] $\text{C}_n\text{H}_{2n-1}$ and C_nH_{2n} [4] $\text{C}_n\text{H}_{2n+1}$ and $\text{C}_n\text{H}_{2n+2}$
- 5 Mustard gas is obtained by - [RPET-2002]
 [1] The action of dilute acids on mustard seeds [2] Treating ethylene with mustard oil
 [3] Treating sulphur chloride with ethylene [4] None of these
- 6 Correct position of double bond in alkene is identified with - [RPET-2002]
 [1] Hydrogenation [2] Ozonolysis [3] Baeyer's reagent [4] Dehydration
- 7 When $\text{CH}_3\text{CH}_2\text{CHCl}_2$ is treated with NaNH_2 the product formed is - [CBSE-2002]
 [1] $\text{CH}_3\text{---CH}=\text{CH}_2$ [2] $\text{CH}_3\text{---C}\equiv\text{CH}$ [3] $\text{CH}_3\text{CH}_2\text{CH}(\text{NH}_2)_2$ [4] $\text{CH}_3\text{CH}_2\text{CHCl}(\text{NH}_2)$
- 8 Lewisite is - [MPPMT-2002]
 [1] $\text{Cl}\cdot\text{CH}=\text{CH}\cdot\text{As} \begin{array}{l} \diagup \text{Cl} \\ \diagdown \text{Cl} \end{array}$ [2] $\text{CH}_2=\text{CH}\cdot\text{As} \begin{array}{l} \diagup \text{Cl} \\ \diagdown \text{Cl} \end{array}$ [3] $\text{CH}_2=\text{CAs} \begin{array}{l} \diagup \text{Cl} \\ \diagdown \text{Cl} \end{array}$ [4] AsCl_2
- 9 With sodium, liberation of hydrogen gas is possible with the following hydrocarbon - [RPMT-2002]
 [1] CH_4 [2] C_2H_6 [3] C_2H_4 [4] C_2H_2
- 10 Hydrocarbon 'A' of molecular formula C_5H_8 gives white precipitate with ammonical AgNO_3 solution. 'A' on treatment with acidified $\text{K}_2\text{Cr}_2\text{O}_7$ produces acid of the formula $(\text{CH}_3)_2\text{CHCOOH}$. Hence the compound 'A' is - [RPMT-2002]
 [1] $(\text{CH}_3)_2\text{CH---CH}=\text{CH}_2$ [2] $\text{CH}_3\text{---CH}=\text{CH---CH}=\text{CH}_2$
 [3] $(\text{CH}_3)_2\text{CH---C}\equiv\text{CH}$ [4] $\text{CH}_3\text{CH}_2\text{CH}_2\text{---C}\equiv\text{CH}$
- 11 Which of the following alkanes contains primary, secondary, tertiary and quaternary carbon atoms together- [MPPMT-2001]
 [1] $(\text{CH}_3)_3\text{CH}$ [2] $(\text{C}_2\text{H}_5)_3\text{CH}$ [3] $(\text{CH}_3)_3\text{CCH}_2\text{CH}(\text{CH}_3)_2$ [4] $(\text{CH}_3)_4\text{C}$

- 12 The shape of methane molecule is - [CPMT 97, MPPMT-2001]
 [1] Tetrahedral [2] Triangular [3] Planar [4] Octahedral
- 13 On electrolysis of sodium acetate H_2 gas is evolved at cathode, C_2H_6 is at anode. Then reaction is known as -
 [1] Frenchland [2] Kolbay [3] Clemenson [4] Wolf-Kelchner [RPMT-2001]
- 14 G.N.G. is - [RPMT-2001]
 [1] CH_4 + Propane + Butane + Higher Alkane (84%) [2] CH_4 + Ethane + Butane (33%) (33%) (33%)
 [3] Benzene + petrol (1) (1) [4] CH_4 + LPG (10%) (90%)
- 15 What is the maximum number of open chain structures possible for C_4H_8 - [MPPMT-2001]
 [1] 2 [2] 3 [3] 4 [4] 1
- 16 Ethene reacts with bromine to form - [MPPMT-2001]
 [1] $Br-CH_2-CH_3$ [2] CH_3-CBr_3 [3] $Br-CH_2-CH_2-Br$ [4] $CHBr_3$
- 17 Types of hybridisation in $CH_2 = C = CH_2$ is - [RPET-2001]
 [1] Only sp^2 [2] Only sp [3] sp and sp^2 [4] sp^2 and sp^3
- 18 Favourable conditions of the polymerisation of ethene is - [RPET-2001]
 [1] Only high temperature [2] Only catalyst
 [3] Only high pressure [4] High temperature and High pressure
- 19 $6CH_2 = CH_2 + B_2H_6 \rightarrow 2(H-C-C)_3B$ - [RPET-2001]

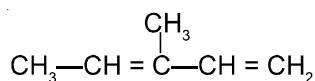
$$\begin{array}{c} H & H \\ | & | \\ (H-C-C)_3B \\ | & | \\ H & H \end{array}$$
- Product is base of formation of organo-boron compound. It was prepared by scientist
 [1] Brown & Benzamine [2] Brown & Zweifel [3] Brown & Metheson [4] Brown & Supparoev
- 20 Reaction of C_2H_2 with $AsCl_3$ in presence of $(AlCl_3 + HCl)$ then product will be - [RPET-2001]
 [1] Lewisite [2] Fumigant [3] Germicide [4] Antiseptic
- 21 If hybridisation in C_2H_2 is sp then bond angle is - [RPET-2001]
 [1] 180° [2] 120° [3] 150° [4] 90°
- 22 Which is correct sequence of bond length is - [RPET-2001]
 [1] $HC \equiv CH > H_2C = CH_2 > H_3C-CH_3$ [2] $H_2C = CH_2 > HC \equiv CH > H_3C-CH_3$
 [3] $H_3C-CH_3 > H_2C = CH_2 > HC \equiv CH$ [4] $H_3C-CH_3 > HC \equiv CH > H_2C = CH_2$
- 23 Shape of C_2H_2 is - [RPET-2001]
 [1] Linear [2] Triangular planar [3] Pyramidal [4] Bent
- 24 Which of the following C—H bond has the lowest bond dissociation energy - [CPMT-2000]
 [1] Primary (1°) C—H bond [2] Secondary (2°) C—H bond
 [3] Tertiary (3°) C—H bond [4] All of these
- 25 1, 3-pentadiene is more stable than 1, 4-pentadiene because of - [RPET-2001, BHU-2000]
 [1] It is conjugated diene [2] It has more dipole moment
 [3] Both are functional & position isomer [4] None

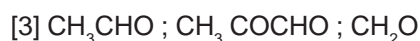
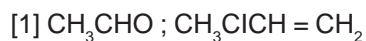
- 26 Which of the following reagent is used to distinguish ethene from ethyne - [KCET-2000]
 [1] Ammonical Cu_2Cl_2 [2] Bromine in CCl_4 [3] Alkaline KMnO_4 [4] Bromine water
- 27 Alkene, which on ozonolysis yields acetone - [MPPMT-2000]
 [1] $\text{CH}_2 = \text{CH}-\text{CH}_2-\text{CH}_3$ [2] $\text{CH}_3-\text{CH} = \text{CH}_2$ [3] $\text{CH}_3-\text{CH}=\text{CH}_2$ [4] $(\text{CH}_3)_2\text{C} = \text{C}(\text{CH}_3)_2$
- 28 Carbons in the compound 1-butene-3-yne are - [MPPET-2000]
 [1] sp hybridised [2] sp^2 hybridised [3] so and sp^2 hybridised [4] sp, sp^2 and sp^3 hybridised
- 29 The compound which gives only acetaldehyde on ozonolysis is - [MPPET-2000]
 [1] Butene-1 [2] Butene-2 [3] Ethylene [4] Propylene
- 30 Compound 'C' can be distinguished from the other three compounds by the reagent - [MPPET-2000]
 (A) $\text{CH}_3\text{C}\equiv\text{C}-\text{CH}_3$ (B) $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_3$ (C) $\text{CH}_3\text{CH}_2\text{C}\equiv\text{CH}$ (D) $\text{CH}_3\text{CH}=\text{CH}_2$
 [1] Bromine in CCl_4 [2] Bromine in acetic acid
 [3] Alkaline KMnO_4 [4] Ammonical silver nitrate
- 31 Which of the following types of bonds are present between two carbon atoms in ethylene - [RPMT-2000]
 [1] 1 π & 4 σ [2] 1 π & 5 σ [3] 3 σ & 1 π [4] 1 σ & 1 π
- 32 Which of the following reagent is used in formation of alkene from alkyl halide - [RPMT-2000]
 [1] Alc. KOH + Heat [2] Aq. KOH + cold water [3] NaOH [4] LiOH
- 33 Chloroform, on warming with Ag powder, gives - [RPET-99, BHU-2000]
 [1] C_2H_2 [2] C_2H_4 [3] C_2H_6 [4] C_6H_6
- 34 Ammonical solution of cuprous chloride give red precipitate with - [AIIMS-2000]
 [1] $\text{H}-\text{C}\equiv\text{C}-\text{CH}_3$ [2] $\text{CH}_2 = \text{CH}_2$ [3] $(\text{C}_2\text{H}_5)_2\text{C}=\text{CH}_2$ [4] $\text{CH}_3-\text{C}\equiv\text{C}-\text{C}_2\text{H}_5$
- 35 Alkynes mainly shows - [RPMT-2000]
 [1] Polymerisation [2] Electrophilic addition
 [3] Free radical substitution [4] All of the above
- 36 $\text{HC}\equiv\text{CH} \xrightarrow[\text{H}_2\text{SO}_4]{\text{Hg}^{2+}} \text{A} \xrightarrow[\text{H}_2\text{O}]{\text{CH}_3\text{MgX}} \text{B} \xrightarrow{\text{O}} \text{C}$, Identify the product C in series - [RPMT-2000]
 [1] Ethyl alcohol [2] Acetone [3] Isopropyl alcohol [4] Acetaldehyde
- 37 Which of the following acidity order is correct - [RPET-2000]
 [1] 1-Alkyne > Alkene > Alkane [2] Alkene > Alkyne > 1-Alkyne
 [3] Alkane > Alkene > 1-Alkyne [4] None of these
- 38 Which hydrocarbon is solid at normal temperature - [RPET-1999]
 [1] CH_4 [2] C_7H_8 [3] C_8H_{18} [4] $\text{C}_{20}\text{H}_{20}$
- 39 For the complete combustion of four liters of ethane the necessary volume of oxygen would be - [RPMT-2000]
 [1] 4 litres [2] 8 litres [3] 12 litres [4] 14 litres
- 40 A reagent used to test unsaturation in alkene is - [KCET-1999]
 [1] Ammonical Cu_2Cl_2 [2] Ammonical AgNO_3
 [3] Solution of Br_2 in CCl_4 [4] Conc. H_2SO_4

- 41 The reaction : $\text{CH}_2 = \text{CH} - \text{CH}_3 + \text{HBr} \rightarrow \text{CH}_3\text{CHBrCH}_3$, is a type of - [BHU-2000, AFMC-1999]
 [1] Nucleophilic addition reaction [2] Free radical addition reaction
 [3] Electrophilic addition reaction [4] Electrophilic substitution reaction
- 42 In the reaction $\text{CH}_2 = \text{CH}_2 \xrightarrow[\text{acid}]{\text{hypochlorous}} \text{M} \xrightarrow{\text{R}} \begin{array}{c} \text{CH}_2\text{OH} \\ | \\ \text{CH}_2\text{OH} \end{array}$ where M = Molecule and R = Reagent M and R are -
 [1] $\text{CH}_3\text{CH}_2\text{Cl}$ and NaOH [2] $\text{CH}_2\text{Cl}-\text{CH}_2\text{OH}$ and aq. NaHCO_3 [CPMT-1999]
 [3] $\text{CH}_3\text{CH}_2\text{OH}$ and HCl [4] $\text{CH}_2=\text{CH}_2$ and heat
- 43 Which of the following isomerism is not shown by alkene - [RPMT-1999]
 [1] Metamerism [2] Chain [3] Position [4] Geometrical
- 44 Alkene not showing addition of HBr according to Anti-Markovnikov's rule is - [RPET-96, RPMT-99]
 [1] 2-Pentene [2] 2-Butene [3] 1-Butene [4] Propene
- 45 $\text{CH}_3-\text{CH}=\text{CH}_2 \xrightarrow{\text{HBr}} \text{A}$, Here product A is - [RPMT-1999]
 [1] $\text{BrCH}_2-\text{CH}=\text{CH}_2$ [2] $\text{CH}_3-\text{CH}_2-\text{CH}_2\text{Br}$ [3] $\text{CH}_3-\text{CH}(\text{Br})-\text{CH}_3$ [4] $\text{Br}-\text{CH}_2-\text{CH}_2\text{Br}$
- 46 Ethene is given by the following compound on dehydration - [RPET-1999]
 [1] Ethyl acetate [2] $\text{C}_2\text{H}_5\text{OH}$ [3] HCHO [4] 1 and 2
- 47 Ethylene possesses - [RPET-1999]
 [1] Two sigma and two pi bonds [2] Two pi bonds
 [3] Five sigma and one pi bonds [4] Four sigma and one pi bond
- 48 Which of the following C-H bonds has lowest bond dissociation energy - [Manipal-1999]
 [1] Primary (1°) C-H bond [2] Secondary (2°) C-H bond
 [3] Tertiary (3°) C-H bond [4] All of these
- 49 In which of the following hydrocarbons, hydrogen is most acidic - [AFMC-2000,99]
 [1] C_6H_6 [2] $\text{CH}_2 = \text{CH}_2$ [3] $\text{CH} \equiv \text{CH}$ [4] CH_3-CH_3
- 50 Bond length of ethane (i), ethene (ii), acetylene (iii) and benzene (iv) follows the order - [CPMT-1999]
 [1] $i > ii > iii > iv$ [2] $i > ii > iv > iii$ [3] $i > iv > ii > iii$ [4] $iii > iv > ii > i$
- 51 Mesitylene is the addition polymer of compound - [RPMT-1999]
 [1] Acetone [2] Propene [3] Propyne [4] Acetylene
- 52 Which one of the following reacts with HOCl to form $\text{CH}_3-\text{CO}-\text{CHCl}_2$ product - [RPMT-1999]
 [1] $\text{CH}_3-\text{C} \equiv \text{C}-\text{CH}_3$ [2] $\text{CH}_3-\text{C} \equiv \text{CH}$ [3] $\text{CH} \equiv \text{CH}$ [4] $\text{CH}_3-\text{CH}_2-\text{C} \equiv \text{CH}$
- 53 Two moles of HBr are added with $\text{CH}_3-\text{C} \equiv \text{CH}$ in the presence of peroxide to give - [RPMT-1999]
 [1] $\text{CH}_3-\text{CH}_2-\text{CHBr}_2$ [2] $\text{CH}_3-\text{CH}(\text{Br})-\text{CH}_2\text{Br}$ [3] $\text{CH}_3-\text{CBr}_2-\text{CH}_3$ [4] $\text{CH}_3-\text{CHBr}-\text{CHBr}_2$
- 54 Tollen's reagent is - [RPMT-1999]
 [1] Solution of CuSO_4 [2] Ammoniacal AgNO_3 solution
 [3] Anhydrous ZnCl_2 [4] Fucine
- 55 C-H bond energy in ethane, ethene and ethyne is - [RPMT-1999]
 [1] same in three [2] Maximum in ethane [3] Maximum in ethyne [4] Maximum in ethene

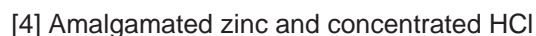
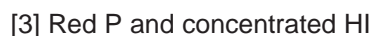
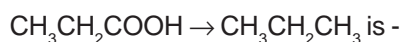
- 56 If mixture of $\text{CH}\equiv\text{CH}$ & N_2 is passed electric spark to give - [RPMT-1999]
 [1] Ether [2] Ethylamine [3] HCN [4] NH_3
- 57 Number of unhybridised orbitals in vinyl acetylene are - [RPMT-1999]
 [1] 2 [2] 3 [3] 1 [4] 6
- 58 Ozonolysis of acetylene gives - [RPMT-1999]
 [1] Glycol [2] Glyoxal [3] Formaldehyde [4] None
- 59 Addition of HOCl to ethylene gives - [RPMT-1999]
 [1] Ethylene chloride [2] Vinyl chloride [3] Ethylidene chloride [4] Dichloro acetaldehyde
- 60 Benzene is a polymer of - [RPET-1999]
 [1] Ethyne [2] Ethylene [3] Methane [4] Etgabe
- 61 Acidic hydrogen is present in - [RPET-1999]
 [1] Ethyne [2] Ethylene [3] Ethane [4] Benzene
- 62 $\text{C}_3\text{H}_8 + \text{Cl}_2 \xrightarrow{\text{Light}} \text{C}_3\text{H}_7\text{Cl} + \text{HCl}$ is an example of which of the following types of reactions - [RPET-1998]
 [1] Substitution [2] Elimination [3] Addition [4] Rearrangement
- 63 Volume of oxygen is required for total combustion of propane - [RPET-1998]
 [1] Five times of propane [2] $2 + 1/2$ times of propane
 [3] 2 times of propane [4] Equal to propane
- 64 Which of the following hydrocarbon has the maximum boiling point - [RPET-1998]
 [1] CH_4 [2] C_2H_6 [3] C_3H_8 [4] C_4H_{10}
- 65 In which of the following carbon group is absent - [RPET-1998]
 [1] Aldehyde [2] Ketone [3] Acid [4] Alkane
- 66 Alkane is prepared by - [RPET-1998]
 [1] Wurtz [2] Reduction to alkyl halide
 [3] By grignard reagent [4] All the above
- 67 When potassium permanganate (KMnO_4) is added to ethylene gives - [MPPET-95, AFMC-1998]
 [1] Glycerol Ethanol [2] Ethanolx [3] Ethanol [4] Ethylene glycol
- 68 Which of the following is the most stable alkene - [Manipal=-94,RPMT-93, AIIMS-98]
 [1] $\text{R}_2\text{C} = \text{CR}_2$ [2] $\text{RCH} = \text{CHR}$ [3] $\text{CH}_2 = \text{CHR}$ [4] $\text{CH}_2 = \text{CH}_2$
- 69 2-Bromopentane is heated with potassium ethoxide in ethanol. The major product obtained - [CPMT-1998]
 [1] 1-Pentene [2] cis-2-pentene [3] trans-2-pentene [4] 2-Ethoxypentane
- 70 Which alkene gives same product with both Markownikoff's and anti Markownikoff's method - [RPMT-1998]
 [1] α -Butylene [2] Propylene [3] α -amylene [4] β -Butylene
- 71 Product from by simplest alkene with baeyer's reagent is - [RPMT-1998]
 [1] CH_3OH [2] $\text{CH}_3\text{CH}_2\text{OH}$ [3] $\begin{array}{c} \text{CH}_2\text{OH} \\ | \\ \text{CH}_2\text{OH} \end{array}$ [4] $\begin{array}{c} \text{CH}_2\text{OH} \\ | \\ \text{CHOH} \\ | \\ \text{CH}_2\text{OH} \end{array}$

- 72 Acetylene on reacting with ammonical AgNO_3 gives - [CPMT-1998]
 [1] Silver mirror [2] Silver metal [3] Silver acetate [4] Silver acetylide
- 73 Which hydrocarbon reacts with sodium and liquid NH_3 - [CPMT-1998]
 [1] $\text{CH}_3\text{—CH}_2\text{—C}\equiv\text{CH}$ [2] $\text{CH}_3\text{—C}\equiv\text{C—CH}_3$ [3] $\text{CH}_3\text{—CH=CH—CH}_3$ [4] $\text{CH}_3\text{—CH}_2\text{—CH=CH}_2$
- 74 Acetylene can be prepared from - [CPMT-1998]
 [1] Potassium fumarate [2] Calcium carbide [3] Ethylene bromide [4] All of the above
- 75 An unknown compound A has molecular formula C_4H_6 . When A is treated with excess of Br_2 a new substance B with formula $\text{C}_4\text{H}_6\text{Br}_4$ is formed. A forms a white ppt. with ammonical silver nitrate solution. A may be - [MPPMT-1998]
 [1] But-1-yne [2] But-2-yne [3] But-1-ene [4] But-2-ene
- 76 In the reaction $\text{CH}_3\text{—C}=\text{C—CH}_3 \xrightarrow[\text{(ii) H}_2\text{O}]{\text{(i) X}} \text{CH}_3\text{—C(=O)—C(=O)—CH}_3$, X is - [MPPET-1998]
 [1] HNO_3 [2] O_2 [3] O_3 [4] KMnO_4
- 77 The compound formed by the reaction of simplest alkyne with excess of bromine is - [RPMT-1998]
 [1] Acetylene dibromide [2] Acetylene tetrabromide
 [3] Vinyl bromide [4] All these above
- 78 Number of σ & π bonds in compound $(\text{CH}_3)_2\text{CHC}\equiv\text{C—CH}_3$ is - [RPMT-1998]
 [1] 13, 3 [2] 14, 1 [3] 14, 2 [4] 15, 2
- 79 Which compound is formed by the reaction of one mole acetylene and two mole hypochlorous acid - [RPMT-1998]
 [1] Chloral [2] Chloro acetaldehyde [3] Dichloro acetone [4] Both 1 & 2
- 80 PVC is the polymer of - [RPMT-1998]
 [1] Vinyl cyanide [2] Vinyl acetate [3] Vinyl chloride [4] Ethylene
- 81 When acetylene is hydrated in the presence of 42% H_2SO_4 containing mercuric sulphate at 330-370, the product obtained is - [AFMC-94,RPMT-1998]
 [1] Acetone [2] Acetaldehyde [3] Isopropyl [4] n-Propyl aldehyde
- 82 The compound formed by ethyne and HBr will be - [RPMT-1998]
 [1] Ethylene bromide [2] Bromoethane [3] Ethylidene bromide [4] Vinyl bromide
- 83 Functional group isomer of 1-butyne is - [RPMT-1998]
 [1] 2-Butyne [2] 2-Butene [3] 1-Butene [4] 1,3-Butadiene
- 84 Mustard gas is given by the reaction of - [RPET-1998]
 [1] C_2H_4 & S_2Cl_2 [2] C_2H_4 & H_2S [3] C_2H_4 & CH_3SH [4] C_2H_4 & H_2SO_4
- 85 Which one has the highest melting point - [RPET-1998]
 [1] C_2H_6 [2] C_3H_8 [3] CH_4 [4] C_4H_{10}
- 39 Indicate the expected structure of the organic product when ethylmagnesium bromide is treated with heavy water (D_2O) - (DCE-1994)
 [1] $\text{C}_2\text{H}_5\text{—C}_2\text{H}_5$ [2] $\text{C}_2\text{H}_5\text{OD}$ [3] C_2H_6 [4] $\text{C}_2\text{H}_5\text{D}$
- 40 Which set of products is expected on reductive ozonolysis of the following diolefin - (DCE-1994)

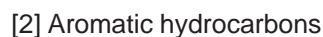




- 41 The reagent used for the conversion, (DCE-1994)



- 42 Petrol for aviation purposes must contain - (DCE-1994)



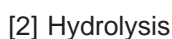
- 43 Bezen on treatment with a mixture of conc. HNO_3 and conc. H_2SO_4 at 100°C gives - (DCE-1994)



- 45 Crude naphtha is a mixture of - (AFMC-1994)



- 46 A liquid hydrocabrbrbon is converted into a misture of gaseous hydrocarbons by - (AFMC-1994)



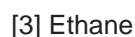
- 47 The first product obtained during fractional distillation of petroleum is - (AFMC-1994)



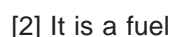
- 48 Fischer-Tropsch process is used in manufacture of - (AFMC-1994)



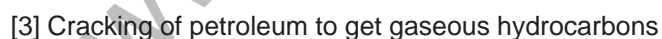
- 49 In an industrual process, coke is heated with quicklime in an electric furnace and the colled product is then treated with water to product - (AFMC-1994)



- 50 Which on of the frollowing statements is not true for natural gas - (KCET-1994)



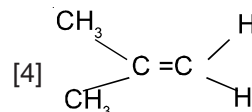
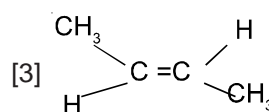
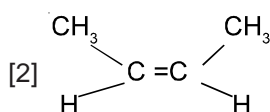
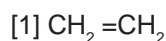
- 51 Petroleum refining is - (KCET-1994)



- 52 Toluene reacts with Cl_2 in the presence of light to give - (MLNR-1994)



- 53 The compound which reacts with HBr obeying Markownikoff's rule is - (MLNR-1994)

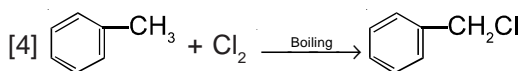
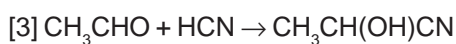
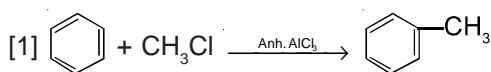


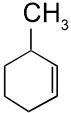
- 54 Coal-tar is a main source of - (JIPMER-1994)

- [1] Aromatic compounds [2] Aliphatic compounds [3] Cycloalkanes [4] Heterocyclic compounds
- 57 Method of converting high boiling hydrocarbons into low boiling hydrocarbons is - **(EAMCET-1994)**
 [1] Reforming [2] Cracking [3] Isomerization [4] Inversion
- 58 Which of the following substances gives an explosive substance when treated with ammonical AgNO_3 solution- **(EAMCET Med.-1994)**
 [1] Ethane [2] Acetylene [3] Ethylene [4] Propane
- 59 Isopropyl bromide on Wurtz reaction gives - **(BHU-1994)**
 [1] Hexane [2] Propane [3] 2, 3-Dimethylbutane [4] neo-Hexane
- 60 In the reaction **(BHU-1994)**
 $\text{C}_6\text{H}_5\text{CH}_3 \xrightarrow{\text{Oxidation}} \text{A} \xrightarrow{\text{NaOH}} \text{B} \xrightarrow{\text{Sodalime}} \text{C}$, the product C is -
 [1] $\text{C}_6\text{H}_5\text{OH}$ [2] C_6H_6 [3] $\text{C}_6\text{H}_5\text{COONa}$ [4] $\text{C}_6\text{H}_5\text{ONa}$
- 61 Mono sodium acetylide reacts with an alkyl halide to form - **(BHU-1994)**
 [1] An alkane [2] An alkene [3] An unsymmetric alkyne [4] An symmetric higher alkyne
- 62 A compound X(C_5H_8) reacts with ammoniacal AgNO_3 to give a white precipitate, and on oxidation with hot alkaline KMnO_4 gives the acid, $(\text{CH}_3)_2\text{CHCOOH}$. Therefore X is - **(AIIMS-1994)**
 [1] $\text{CH}_2 = \text{CHCH} = \text{CHCH}_3$ [2] $\text{CH}_3\text{CH} = \text{CHCH}_2\text{CH}_3$ [3] $(\text{CH}_3)_2\text{CH}-\text{C} = \text{CH}$ [4] $(\text{CH}_3)_2\text{C} = \text{C} = \text{CH}_2$
- 64 When petroleum is heated gradually, the first batch of vapours evolved will be rich in - **(Pb. CET-1994)**
 [1] Kerosene [2] Petroleum ether [3] Diesel [4] Lubricating oil
- 70 Baeyer's reagent is - **(BHU-1995)**
 [1] Saturated KMnO_4 solution [2] Neutral KMnO_4 solution
 [3] Alkaline KMnO_4 solution [4] Acidic KMnO_4 solution.
- 71 Complete combustion of CH_4 gives - **(BHU-1995)**
 [1] $\text{CO}_2 + \text{H}_2\text{O}$ [2] $\text{CO}_2 + \text{H}_2$ [3] COCl_2 [4] $\text{CO} + \text{CO}_2 + \text{H}_2\text{O}$
- 72 Liquefied petroleum gas (LPG) mostly contains - **(KCET-1995)**
 [1] Methane [2] Ethane [3] Butene [4] Propane
- 74 Tetraethyl-lead is a - **(MLNR-1995)**
 [1] Solvent [2] Petroleum additive [3] Oxidising agent [4] Fire extinguisher.
- 76 Acetylene reacts with HOCl to form - **(EAMCET-1995)**
 [1] Dichloroacetaldehyde [2] Ethylene chlorohydrin [3] Chloroacetaldehyde [4] Acetaldehyde.
- 78 A war gas Lewisite is formed by reaction of arsenic chloride with - **(AFMC-1996)**
 [1] CH_4 [2] C_6H_6 [3] C_2H_2 [4] C_2H_4
- 79 Major constituent of light oil is - **(AFMC-1996)**
 [1] Benzene [2] Phenol [3] Aniline [4] Anthracene
- 87 The product formed by the action of chlorine on ethene in saturated solution of KBr is/are - **(Pb. CET-1996)**
 [1] $\text{ClCH}_2\text{CH}_2\text{Cl} + \text{ClCH}_2\text{CH}_2\text{CH}_2\text{Br}$ [2] $\text{ClCH}_2\text{CH}_2\text{Cl}$
 [3] $\text{ClCH}_2\text{CH}_2\text{Cl} + \text{BrCH}_2\text{CH}_2\text{Cl}$ [4] $\text{ClCH}_2\text{CH}_2\text{Cl} + \text{BrCH}_2\text{CH}_2\text{Br} + \text{ClCH}_2\text{CH}_2\text{Br}$

- 88 The order of reactivity of halogens in aliphatic substitution reactions is - (Pb. CET-1996)
 [1] $\text{Br}_2 > \text{Cl}_2 > \text{F}_2$ [2] $\text{Cl}_2 > \text{Br}_2 > \text{F}_2$ [3] $\text{F}_2 > \text{Cl}_2 > \text{Br}_2$ [4] $\text{F}_2 > \text{Br}_2 > \text{Cl}_2$
- 89 In which of the following molecules hydrogen is most acidic - (Pb. CET-1996)
 [1] Acetylene [2] Methane [3] Ethane [4] Ethylene
- 90 When n-propyl iodide is heated with alcoholic KOH one of the products is - (DCE-1996)
 [1] Propene (C_3H_6) [2] Cyclopropane (C_3H_6) [3] C_3H_4 [4] C_3H_8
- 91 When propene is treated with HBr in the dark and in absence of peroxide the main product is - (DCE-1996)
 [1] 1-Bromopropane [2] 2-Bromopropane [3] 1, 2-Dibromopropane [4] 1, 3-Dibromopropane
- 92 When an alkyne, $\text{RC}\equiv\text{CH}$, is treated with cuprous ion in an ammoniacal medium, one of the products is -
 [1] $\text{RC}\equiv\text{CCu}$ [2] $\text{CuC}\equiv\text{CH}$ [3] $\text{CuC}\equiv\text{CCu}$ [4] $\text{RC}=\text{CR}$ (DCE-1996)
- 95 Formation of polyethene from calcium carbide takes place as follows -
 $\text{CaC}_2 + 2\text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{C}_2\text{H}_2$;
 $\text{C}_2\text{H}_2 + \text{H}_2 \rightarrow \text{C}_2\text{H}_4$; $n\text{C}_2\text{H}_4 \rightarrow (-\text{CH}_2-\text{CH}_2-)_n$
 The amount of polythene obtained from 64 kg of CaC_2 is (AIIMS-1997)
 [1] 7 kg [2] 14 kg [3] 21 kg [4] 28 kg
- 96 1-Butyne reacts with cold alkaline KMnO_4 to yield - (AIIMS-1997)
 [1] $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ [2] $\text{CH}_3\text{CH}_2\text{COOH}$ [3] $\text{CH}_3\text{CH}_2\text{COOH} + \text{CO}_2$ [4] $\text{CH}_3\text{CH}_2\text{COOH} + \text{HCOOH}$
- 97 Which of the following applies to the reaction. - (AMU-1997)
 $\text{CH}_3-\text{CHBr}-\text{CH}_2\text{CH}_3 \xrightarrow{\text{alc. KOH}}$
 (A) $\text{CH}_3\text{CH}=\text{CHCH}_3$ (major product) (B) $\text{CH}_2=\text{CH}-\text{CH}_2\text{CH}_3$ (minor product)
 [1] Markovnikov's rule [2] Saytzeff's rule [3] Kharash effect [4] Hofmann's rule
- 98 Which of the following isomers will have the highest boiling point - (AMU-1997)
 [1] $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_3$ [2] $\text{CH}_3-\underset{\text{CH}_3}{\text{CH}}-\text{CH}_2-\text{CH}_2-\text{CH}_3$
 [3] $\text{CH}_3-\underset{\text{CH}_3}{\text{CH}}-\underset{\text{CH}_3}{\text{CH}}-\text{CH}_3$ [4] $\text{CH}_3-\overset{\text{CH}_3}{\text{CH}}-\text{CH}_2-\text{CH}_3$
- 105 $\text{C}_3\text{H}_8 + \text{Cl}_2 \xrightarrow{\text{Light}} \text{C}_3\text{H}_7\text{Cl} + \text{HCl}$ (AFMC-1997)
 The above reaction is an example of -
 [1] Elimination [2] Substitution [3] Addition [4] Rearrangement
- 106 Iodoethane reacts with sodium in the presence of dry ether. The main products is - (AFMC-1997)
 [1] Pentene [2] Propyne [3] Butane [4] Butene
- 109 Toluene on oxidation with chromyl chloride produces - (BHU-1997)
 [1] benzoic acid [2] Benzaldehyde [3] Chlorobenzene [4] None of these
- 110 When ethylbromide and n-propyl bromide is allowed to react with sodium, in ether, they form - (BHU-1997)
 [1] Single alkane [2] Mixture of two alkanes
 [3] Mixture of three alkanes [4] Mixture of four alkanes
- 183 A salt producing hydrocarbon among the compound is - (KCET-2002)
 [1] Ethyne [2] Ethene [3] Methane [4] Ethane
- 184 Octane number is zero by - (MP PET-2002)

- [1] Isoheptane [2] n-Heptane [3] Isoctane [4] n-Octane
- 186** LPG contains - **(BCEE-2002)**
- [1] Methane [2] Ethane [3] Butane [4] None of the above
- 187** Wurtz reaction involves the interaction of alkyl halides in dry ether with - **(MP PET-2002)**
- [1] Sodium [2] Zinc [3] Copper [4] Platinum
- 188** Which of the following has lowest octane number - **(MP PET-2002)**
- [1] iso-octane [2] n-Heptane [3] n-Hexane [4] n-nonane
- 189** The process in which higher hydrocarbons are broken down into lower hydrocarbons by controlled pyrolysis is called - **(MP PET-2002)**
- [1] Hydrolysis [2] Cracking [3] Oxidation [4] Reduction
- 190** Ethane is formed by the reaction of methyl iodide and sodium metal in dry ether solution. The reaction is known as - **(MP PMT-2002)**
- [1] Clemmensen reduction [2] Kolbe's reaction [3] Wurtz reaction [4] Cannizzaro reaction
- 191** Which of these will not react with acetylene - **(AIEEE-2002)**
- [1] NaOH [2] ammoniacal AgNO₃ [3] Na [4] HCl
- 192** What is the product formed when acetylene reacts with hypochlorous acid - **(AIEEE-2002)**
- [1] CH₃COCl [2] ClCH₂CHO [3] Cl₂CHCHO [4] ClCH₂COOH.
- 193** For the reaction, - **(Orissa JEE-2002)**
- CH₃-CH≡CH₂ + HOCl → A, The product A is
- [1] CH₃-CHCl-CH₂OH [2] CH₃-CH(OH)-CH₂Cl
- [3] CH₃-CH₂-CH₂-COCl [4] $\begin{array}{c} \text{OH} \\ | \\ \text{CH}_3-\text{C}-\text{CH}_3 \\ | \\ \text{Cl} \end{array}$
- 194** PVC is used for manufacture of - **(Orissa JEE-2002)**
- [1] Types [2] Cosmetics [3] Non-stick pans [4] Plastic pipes.
- 195** Butene-1 may be converted to butane by reaction with - **(AIEEE-2003)**
- [1] Pd/H₂ [2] Zn - HCl [3] Xn - HCl [4] Zn - Hg.
- 196** On mixing a certain alkane with chlorine and irradiating it with ultraviolet light, it forms only one monochloroalkane. This alkane could be - **(AIEEE-2003)**
- [1] neopentane [2] propane [3] pentane [4] isopentane
- 197** The correct order of reactivity towards the electrophilic substitution of the compounds, aniline (I), benzene (II) and nitrobenzene (III), is - **(CBSE PMT-2003)**
- [1] II > III > I [2] I < II > III [3] I > II > III [4] III > II > I
- 198** Which one of the following is a free radical substitution reaction - **(CBSE PMT-2003)**



- 199 IUPAC name of  is - (AIIMS-2003)
- [1] 3-methyl cyclohexene [2] 1-methyl cyclohex-2-ene
 [3] 6-methyl cyclohexene [4] 1-methyl cyclohex-5-ene
- 200 The ortho/para directing group among the following is - (AIIMS-2003)
- [1] —Cl [2] —CN [3] —COCH₃ [4] —NHCOCH₃
- 201 The treatment of benzene with isobutene in the presence of sulphuric acid gives - (AIIMS-2003)
- [1] Isobutyl benzene [2] tert-butyl benzene [3] n-Butyl benzene [4] No reaction
- 202 Name the alkene with the molecular formula C₁₀H₂₀ - (Kerala MEE-2003)
- [1] Dodecene [2] Undecene [3] Decene [4] Heptene
- 203 In electrophilic substitution reaction nitrobenzene is - (Kerala MEE-2003)
- [1] meta-directing [2] ortho-directing [3] para-directing [4] not-selective.
- 204 The chemical added to leaded petrol to prevent the deposition of lead in the combustion chamber is - (Kerala MEE-2003)
- [1] Isoctane [2] Ethylenedibromide [3] Tetraethyl lead [4] Mercaptan
- 205 Hydrolysis of the ozonide of 1-butene gives - (Kerala MEE-2003)
- [1] Ethylene only [2] Acetaldehyde and formaldehyde
 [3] Propionaldehyde and formaldehyde [4] Acetaldehyde and oxalic acid.
- 206 Alkyl halides react with metallic sodium in dry ether producing - (Kerala MEE-2003)
- [1] Alkanes with same number of carbon atoms
 [2] Alkanes with double the number of carbon atoms
 [3] Alkanes with triple the number of carbon atoms
 [4] Alkenes with double the number of carbon atoms.
- 207 Benzoic acid, when heated with soda lime yields - (Kerala MEE-2003)
- [1] Benzaldehyde [2] Benzene [3] Toluene [4] Benzyl alcohol

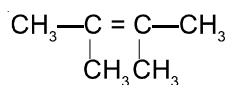
EXERCISE # 3

- 22 Suitable for preparation of higher alkanes from a lower alkyl halide is subjected to -
 [1] Reduction [2] Hoffmann bromamide reaction
 [3] Hunsdiecker reaction [4] Wurtz reaction
- 23 The organic reaction product from the reaction of methyl magnesium bromide and ethyl alcohol is -
 [1] Methane [2] Ethane [3] Propane [4] Butane
- 24 Aqueous solution of which compound gave ethane on electrolysis -
 [1] Acetic acid [2] Acetamide [3] Potassium acetate [4] Ethyl acetate
- 25 In the complete combustion of C_nH_{2n+2} , the number of oxygen moles required is -
 [1] $n/2O_2$ [2] $\left(\frac{n+1}{2}\right)O_2$ [3] $\left(\frac{3n+1}{2}\right)O_2$ [4] $\left(\frac{n+2}{2}\right)O_2$
- 26 The catalyst used to convert alkanes containing 6 to 10 carbon atoms into benzene and its homologues at nearly $600^\circ C$ are -
 [1] Cr_2O_3 and Al_2O_3 [2] Cr_2O_3 and $AlCl_3$ [3] H_2SO_4 and HF [4] BF_3
- 27 Which sodium salt will be heated with soda lime to obtain propane -
 [1] $CH_3-CH_2-C(=O)O^-Na^+$ [2] $CH_3-CH_2-CH_2-C(=O)O^-Na^+$
 [3] $(CH_3)_2CH-C(=O)O^-Na^+$ [4] 2nd and 3rd both
- 28 Alkyl halides on reduction with Zn-Cu couple and alcohol give -
 [1] Alkanes [2] Alkenes [3] Alkynes [4] Cyclic compounds
- 29 The most volatile alkane is -
 [1] n-pentane [2] isopentane [3] neopentane [4] n-hexane
- 30 Wurtz reaction is best used for making -
 [1] Unbranched alkanes [2] symmetrical alkanes
 [3] Unsymmetrical alkanes [4] n-Alkanes with odd. number of carbon
- 31 Which sodium salt will be heated with $NaOH + CaO$ to obtain isobutane -
 [1] $CH_3-CH_2-C(=O)O^-Na^+$ [2] $CH_3-\underset{\text{CH}_3}{\text{CH}}-C(=O)O^-Na^+$
 [3] $(CH_3)_3CH-C(=O)O^-Na^+$ [4] $(CH_3)_2CH-CH_2-C(=O)O^-Na^+$
- 32 What are the gases evolved at anode during Kolbe synthesis -
 [1] Hydrocarbons [2] CO_2 [3] Both [4] None
- 33 Action of $RMgX$ with vinyl chloride gives -
 [1] Alkane [2] Alkyne [3] Alkene [4] All

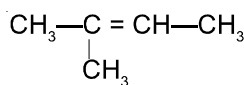
34 Which alkene shows geometrical isomerism -

- [1] Cab = Cae [2] Cab = Cab [3] Cab = Cbd [4] All

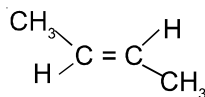
35 The relative stability of the compounds -



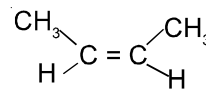
(i)



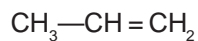
(iii)



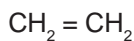
(iii)



(iv)



(v)



(vi)

[1] i > ii > iii > iv > v > vi

[2] vi > v > iv > iii > ii > i

[3] i > iii > v > ii > iv > vi

[4] ii > i > iv > iii > v > vi

36 The reaction of an alkene with per acids to form an epoxide is known after the name of -

- [1] Baeyer [2] Brown [3] Prileshchiaevev [4] Kharasch

37 Cis-2-Butene cannot be changed to trans-2-butene because -

- [1] Cis isomer has two hydrogen atoms on the same side of the π bond
 [2] Trans isomer has two hydrogen atoms on the opposite of the π bond
 [3] Of hindered rotation about the carbon-carbon double bond
 [4] The transformation does not require energy

38 Addition of hypohalous acid to ethene leads to the formation of -

- [1] Halocarbons [2] Halohydrin [3] Haloalkyne [4] Halohydrates

39 Acetylene can be prepared from -

- [1] Potassium fumarate [2] Calcium carbide [3] Ethylene bromide [4] All

40 Which one of the following compounds does not form an ozonide -

- [1] Ethene [2] Propyne [3] Propene [4] Propane

41 Mesitylene is obtained by the polymerisation of -

- [1] Propyne [2] Propane [3] Propene [4] None of these

42 Identify X in the reaction $\text{CH}_2=\text{CH}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{intermediate} \xrightarrow[\text{boil}]{\text{H}_2\text{O}} \text{X}$ -

- [1] CH_3OH [2] $\text{CH}_3\text{CH}_2\text{OH}$ [3] CH_3COCH_2 [4] CH_3OCH_3

43 The catalyst used in Ziegler process for polyethylene manufacture -

- [1] Consists of aluminium triethyl and titanium tetrachloride
 [2] Consists of aluminium chloride and titanium dioxide
 [3] Is vanadium pentoxide
 [4] Is finely divided nickel

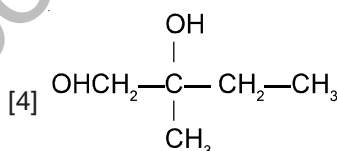
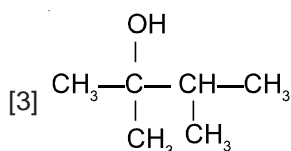
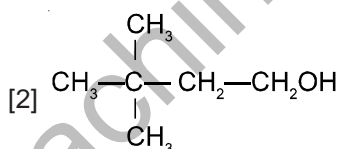
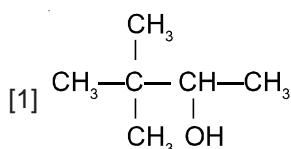
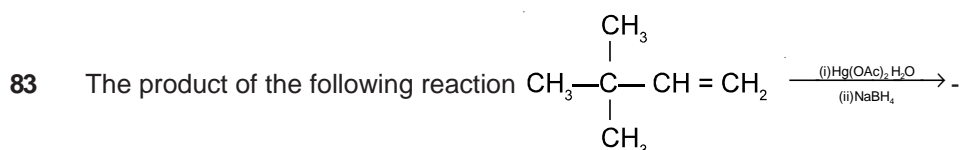
44 Conversion of CH_4 to CH_3Cl is an example of reaction -

- [1] Free radical substitution [2] Free radical addition
 [3] Electrophilic substitution [4] Nucleophilic substitution

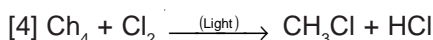
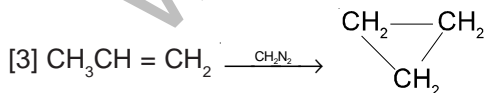
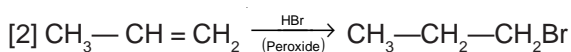
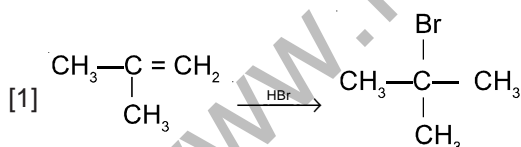
- 45 Baeyer's reagent is used in the laboratory for -
 [1] Reduction process [2] Oxidation process [3] Detection of glucose [4] Detection of double bond
- 46 1-Chlorobutane, on reaction with alcoholic potash (KOH), gives -
 [1] 1-Butene [2] 1-Butanol [3] 2-Butene [4] 2-Butanol
- 47 A compound is treated with NaNH_2 to give sodium salt. Identify the compound -
 [1] C_2H_2 [2] C_6H_6 [3] C_2H_6 [4] C_2H_4
- 48 Which one of the following is used to make 'non-stick' cookware -
 [1] Polystyrene [2] Polytetrafluoroethylene [3] Poly-ethylene [4] None of these
- 49 The complete combustion of CH_4 gives -
 [1] $\text{CO}_2 + \text{H}_2\text{O}$ [2] $\text{CO}_2 + \text{H}_2$ [3] $\text{CO}_2 + \text{COCl}_2$ [4] $\text{CO} + \text{H}_2\text{O}$
- 50 Which hydrocarbon are not formed by the Wurtz reaction of ethyl iodide and n-propyl iodide -
 [1] n-Butane [2] n-Heptane [3] n-pentane [4] n-Hexane
- 51 Which product is not formed in chlorination of CH_4 -
 [1] $\text{CH}_3\text{—Cl}$ [2] $\text{CH}_3\text{—CH}_3$ [3] Cl_2 [4] None
- 52 What is the required volume of O_2 (lit.) for the complete combustion of 60 gm ethane -
 [1] 6.12 [2] 7.8 [3] 15.68 [4] 22.4
- 53 In nitration of propane & higher alkanes shows -
 [1] Free radical substitution [2] Ionic mechanism [3] Both [4] None
- 54 Methane cannot be formed by -
 [1] CoCl_2 [2] CS_2 [3] CHCl_3 [4] CCl_2
- 55 Reaction of isobutylene and conc $\text{H}_2\text{SO}_4 + \text{SO}_3$ gives -
 [1] 2-Methylpropane-2-sulphonic acid [2] n-butyl sulphonic acid
 [3] Both [4] None
- 56 Which compound does not give an alkane on reduction by Red P + HI -
 [1] Alcohol [2] Aldehyde & Ketone [3] Acid [4] Acid derivatives
- 57 The reaction of perbenzoic acid with β -butylene gives -
 [1] 2,3-Butanediol [2] 1,2-Epoxybutane [3] 2,3-epoxypropane [4] 2,3-Epoxybutane
- 58 $\text{CH}_2 = \text{CH}_2 \xrightarrow[\text{CCl}_4]{\text{Br}_2} \text{A} \xrightarrow[\text{(ii) NaNH}_2]{\text{(i) Alc. KOH}} \text{B} \xrightarrow{+2\text{HX}} \text{C}$ in reaction C is -
 [1] Vic di halide [2] Gem di halide [3] Gem di bromide [4] α, ω - di halide
- 59 Dimerisation of isobutylene by conc H_2SO_4 gives two compounds. What is the relation between them -
 [1] Functional isomers [2] Position isomers [3] Tautomers [4] Chain isomers
- 60 What is the main product of addition of "Tollens' reagent" at α -butylene -
 [1] 2-Chloro-1-nitrosopropane [2] 1-Chloro-2-nitrosobutane
 [3] 2-chloro-1-nitrosobutane [4] Butane nitrosochloride
- 61 What type of compound is formed by the reaction of diazomethane with methyl ethylene -
 [1] saturated acyclic [2] Saturated homocyclic [3] Homocyclic aromatic [4] Unsaturated homocyclic

- 62 The application of ethylene are -
 [1] Cracking [2] Isomerisation [3] Substitution [4] Elimination
- 63 The application of ethylene are -
 [A] Formation of Mustard gas [B] Ripening of Fruits
 [C] Formation of Lewisite [D] Formation of Glycol
 [1] ABD [2] ABC [3] ACD [4] BCD
- 64 Which reagent are not suitable for differentiation of ethane & ethene -
 [1] Baeyer reagent [2] Conc. H_2SO_4
 [3] Br_2 solution [4] Ammonical cuprous chloride
- 65 $CH_2 = CH_2 + H_2O \xrightarrow[CiCl_2]{PdCl_2}$ X, in reaction X is -
 [1] Acetic acid [2] Ethylene glycol [3] Ethanal [4] Ethylene oxide
- 67 Which of the compounds are not used in the "Oxo reaction" of olefins -
 [1] HCHO [2] CO [3] Co [4] H_2
- 68 Which olefine is formed on the heating Dimethyl n-propylamine oxide at $150^\circ C$ -
 [1] Ethene [2] Ethyl ethylene [3] Methyl ethylene [4] Sym. Dimethyl ethylene
- 69 Which compound is formed by the oxidation of SeO_2 on ethyl ethylene -
 [1] 2-butene-1-ol [2] 3-butene-2-ol [3] 1-butene-1-ol [4] 3-butene-1-ol
- 70 Koch reaction on propene give -
 [1] Isovaleric acid [2] Isobutyric acid [3] Propionic acid [4] None of these
- 71 Total no. of C-atom in a simplest hydrocarbon molecule containing three acetylenic H-atom -
 [1] 4 [2] 5 [3] 6 [4] 7
- 72 Which of the following is formed by the Kolbe's electrolysis of the mixture of potassium salt of maleic acid and fumaric acid -
 [1] $C_2H_4 + C_2H_2 + CO_2$ [2] $C_2H_2 + C_2H_4$ [3] $C_2H_2 + CO_2$ [4] $C_2H_4 + CO_2$
- 73 Which of the unsaturated compounds react with sodamide -
 [1] 2-butyne [2] 1-butene [3] 2-buten [4] 1-butyne
- 74 In Whol's Ziegler reaction which group is substituted by the allylic hydrogen atom of alkene -
 [1] $-OH$ [2] $-NH_2$ [3] $-Br$ [4] $-COOH$
- 75 The formula of war gas Lewisite is -
 [1] $Cl_2As-CH=CH_2$ [2] $Cl_2As-CH=CHCl$ [3] $(Cl-CH=CH)_2AsCl$ [4] $ClCH=CH-Ash_2$
- 76 Reagent can apply for the formation of chloroprene from acetylene -
 [1] $Cl(NH_3)_2$ and HCl [2] Cl_2Cl_2 and O_2 [3] $Ni(CO)_4$ [4] $Ni(CO)_4$ and $(C_6H_5)_3P$
- 77 $CH \equiv CH + CO + H_2O \xrightarrow{Ni(CO)_4}$ Product, for this reaction which statement is false -
 [1] The product of reaction is an α, β -unsaturated acid
 [2] In reaction the addition of Hydrogen and carboxylic group at π bond
 [3] The product name in this reaction is acrylic acid
 [4] The product reacts with ethyl alcohol to give ethyl butanoate

- 78 Grignard's reagent gives alkane with -
 [1] H_2O [2] $\text{C}_2\text{H}_5\text{OH}$ [3] $\text{C}_2\text{H}_5\text{NH}_2$ [4] All
- 79 n-heptane on reaction with chromium oxide, then dehydrogenation followed by cyclisation gives -
 [1] 1-heptene [2] Benzene [3] o-xylene [4] Methyl benzene
- 80 $\text{A} \xrightarrow{\text{Electrolysis}} \text{B} \xrightarrow[\text{BF}_3, \text{HgO}]{\text{CH}_3\text{OH}} \text{Methylal}$, [A] is -
 [1] Potassium formate [2] Potassium acetate [3] Sodium succinate [4] Sodium fumarate
- 81 Which of the following reagent converts the propene to 1-propanol -
 [1] $\text{H}_2\text{O}, \text{H}_2\text{SO}_4$ [2] aqueous KOH [3] $\text{MgSO}_4, \text{NaBH}_4/\text{H}_2\text{O}$ [4] $\text{B}_2\text{H}_6, \text{H}_2\text{O}_2, \text{OH}^-$
- 82 Acetylene can be formed by -
 [1] Fumaric acid [2] Malic acid [3] Succinic acid [4] oxalic acid



- 84 Review the following reactions and choose reactions which are completed by free radical mechanism -

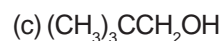
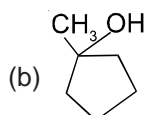
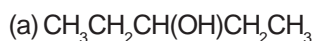



- 85 When $\text{CH}_3\text{CH}_2\text{Br}$ reacts with sodium acetylide, the main product is -
 [1] 1-Butane [2] 1-Butene [3] 1-Butyne [4] 3-Butane
- 1 The catalytic hydrogenation of alkene and alkyne is called as -
 [1] Rosenmund reaction [2] Sabatier-Senderen's reaction
 [3] Clemenson reduction [4] Wolf-Kirchner reduction

- Q.2** Acetone gives the following alkane on clemmensen reduction -
 [1] Ethane [2] Propane [3] hexane [4] Butane
- Q.3** Which of the following statement is correct about alkenes -
 [1] They are coloured and soluble in water
 [2] Their boiling point decreases with the increment in molecular weight
 [3] They are colourless, odourless and tasteless
 [4] None
- Q.4** What would be the product when methane react with fluorine -
 [1] CH_3F [2] CF_4 [3] Carbon black [4] No reaction
- Q.5** In nitration of propane the main product will be -
 [1] 1-nitro propane [2] 2-nitro propane
 [3] 1 and 2 [4] 1-nitro propane + 2-nitro + nitro methane + nitro ethane
- Q.6** Reaction species of sulphonation of alkane will be -
 [1] SO_3 [2] SO_3^+ [3] HSO_3 [4] HSO_3^+
- Q.7** $\text{C}_2\text{H}_6 + \text{SO}_2 + \text{Cl}_2 \xrightarrow{\text{uv light}}$ product in this reaction product will be -
 [1] C_2H_4 [2] $\text{CH}_3\text{CH}_2\text{Cl}$ [3] $\text{CH}_3\text{CH}_2\text{SO}_2\text{Cl}$ [4] C_2H_2
- Q.8** Product of the Wolff-kishner reduction is -
 [1] Alkene [2] Alkyne [3] Alkane [4] Amine
- Q.9** The reaction $2\text{C}_n\text{H}_{2n+2} + 10\text{O}_2 \rightarrow 6\text{CO}_2 + 8\text{H}_2\text{O}$ is true for the alkane -
 [1] Butane [2] Ethane [3] Propane [4] All of the above
- Q.10** Reed reaction is used in the formation of -
 [1] Detergent [2] Soap [3] Both of the above [4] None of these
- Q.11** n-octane by isomerisation gives -
 [1] Triptane [2] n-butane [3] Iso-octane [4] Iso-octane
- Q.12** By which of the following statements is incorrect about the homologous series of alkenes -
 [1] Dehydrogenation [2] Dehydration [3] Decarboxylation [4] Polymerisation
- Q.13** A mixture of ethyl iodide and n-propyl iodide is subjected to Wurtz reaction. the hydrocarbon that not be formed is -
 [1] n-Butane [2] n-Heptane [3] n-Pentane [4] n-hexane
- Q.14** Suitable for preparation of higher alkanes from a lower alkyl halide is subjected to -
 [1] Reduction [2] hoffmann bromamide reaction
 [3] Hunsdiecker reaction [4] Wurtz reaction

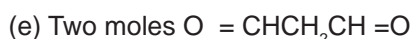
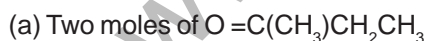
EXERCISE # 4

1. Write structural formula for the five isomeric hexanes and name them by the IUPAC system.
2. Write the structures and identify all the 1° , 2° , 3° and 4° C's in (a) 2,2-dimethylpentane, and (b) 1-bromo-2-dimethylpentane.
3. Give the condensed formulas for the alkanes (a) C_8H_{18} and $C_{11}H_{24}$ with the greatest number of methyl groups.
4. Derive the structural formulas and give the IUPAC names for all dibromo derivatives of propane.
5. What effect does branching of an alkane chain have on the melting point (mp) ?
6. Why are alkanes said to be hydrophobic.
7. Write the structure of all the alkenes that can be hydrogenated to form 2-methylpentane.
8. Why is the Wurtz-Fittig synthesis not a good method for preparing propane ?
9. Prepare butane from chloroethane using the Corey-House synthesis.
10. Write a balanced equation for the reaction of chlorine with an excess of methane
11. Why is light or heat necessary to initiate the chlorination reaction ?
12. Compare the reactivity of the halogens towards alkanes.
13. When sulfuryl chloride is used to chlorinate an alkane, an organic peroxide, ROOR is used as an initiator. SO_2 is also a product. Write a mechanism for the chlorination, including the role of the peroxide.
14. Which isomers of C_4H_9Br yield only a single alkene on dehydrohalogenation ? Give the structures of the alkenes.
15. Give the alkenes formed from acid-catalyzed dehydration of :

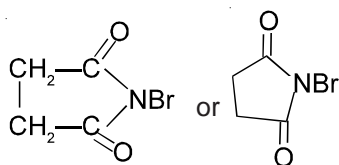


16. Compare and account for the products formed by dehydration of (a)  and (b) 

17. Write structural formulas for the compounds which yield the following products on reductive ozonolysis :



18. (a) Compare the products from the addition of HBr to propene in (i) the absence and (ii) the presence of O_2 or peroxides, ROOR.
(b) What is the essential mechanistic difference between these two reactions ?
19. Give the products of the reaction of cyclohexene in CCl_4 with (a) sulfuryl chloride, Cl_2SO_2 , (b) t-butyl hypochlorite, Me_3COCl , and (c) N-bromosuccinimide (NBS).



N-Bromosuccinimide

20. From propene, prepare (a) 2-chloropropane, (b) 1-chloropropane, (c) Hexane, (d) 2-methylpentane, and (e) 2,3-dimethylbutane, Later synthesis can use products made earlier.
21. Devise a synthesis of (a) 3-Bromocyclopentene and (b) 3,5-dibromocyclopentene from cyclopentanol.
22. From PrOH . prepare (a) 1,2,3-trichloropropane, (b) 1,3-dibromo-2-chloropropane, (c) 1-bromo-2-chloro-3-iodopropane, (d) 1,1,2-tribromopropane, and (e) $\text{BrCH}_2\text{CHOHCH}_2\text{Cl}$.
23. Supply a structural formul for C_6H_{10} which reacts with hot KMnO_4 to form adipic acid, $\text{HOOC}(\text{CH}_2)_4\text{COOH}$.
24. (a) Give the structural formulas for the seven alkynes of the formula C_6H_{10} .
 (b) Give the IUPAC an derived name for each isomer.
 (c) Which isokers in (a) are terminalalkynes ?
25. Write the structural formula for an alkyne hydrocarbon having the fewest number of C's which has geometric isomers, and give the IUPAC name for both geometric isomers.
26. Give a simple (test tube) reaction to distinguish 1-butyne from 2-butyne.
27. Write equations for the preparation of (a) $\text{HC}\equiv\text{CH}$ and (b) $\text{DC}\equiv\text{CD}$

SOLVED EXAMPLES

Ex-1 Which of the following compounds will form a hydrocarbon on reaction with a Grignard reagent -

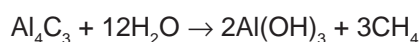
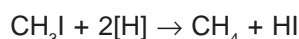
- [1] $\text{CH}_3\text{CH}_2\text{OH}$ [2] CH_3CHO [3] CH_3COCH_3 [4] $\text{CH}_3\text{CO}_2\text{CH}_3$

Sol. (3) Self explanatory equation.

Ex-2 Methane is formed when -

- [1] Sodium acetate is heated with soda-lime [2] Iodomethane is reduced
[3] Aluminium carbide reacts with water [4] All.

Sol. (4) $\text{CH}_3\text{COONa} + \text{NaOH} \xrightarrow{\text{CaO}} \text{CH}_4 + \text{Na}_2\text{CO}_3$



Ex-3 If n is the number of carbon atoms in the potassium salt of a carboxylic acid, then the alkane formed on electrolysis of aqueous solution of this salt would have carbon atoms equal to -

- [1] n [2] $n - 1$ [3] $2n - 1$ [4] $2(n - 1)$

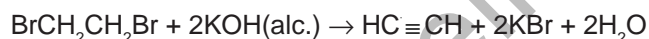
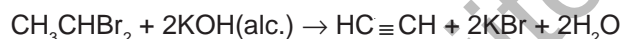
Sol. (4) $2\text{RCOO}^- \rightarrow \text{R}-\text{R} + 2\text{CO}_2 + 2\text{e}^-$

$\text{R}-\text{R}$ has $2(n-1)$ carbon atoms.

Ex-4 Ethne can be prepared in a single step from -

- [1] Calcium carbide [2] Ethylidene bromide [3] Ethylene bromide [4] All of these

Sol. (4) $\text{CaC}_2 + 2\text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + \text{C}_2\text{H}_2$



Ex-5 2,3-Dibromobutane, when heat with zinc dust, yields -

- [1] 2-Butene [2] 2-Butyne [3] 1-Butene [4] Butane.

Sol. (1) Heating with zinc dust brings about dehalogenation of 2, 3-dibromobutane.

Ex-6 An aqueous solution of potassium salt of fumaric acid is electrolysed. The hydrocarbon produced at anode is -

- [1] Ethane [2] Ethene [3] Methane [4] Ethyne

Sol. (4)
$$\begin{array}{c} \text{CHCOOK} \\ || \\ \text{CHCOOK} \end{array} + 2\text{H}_2\text{O} \xrightarrow{\text{Electrolysis}} \begin{array}{c} \text{CH} \\ ||| \\ \text{CH} \end{array} + 2\text{CO}_2 + \text{H}_2 + 2\text{KOH}$$

Potassium fumarate

Acetylene

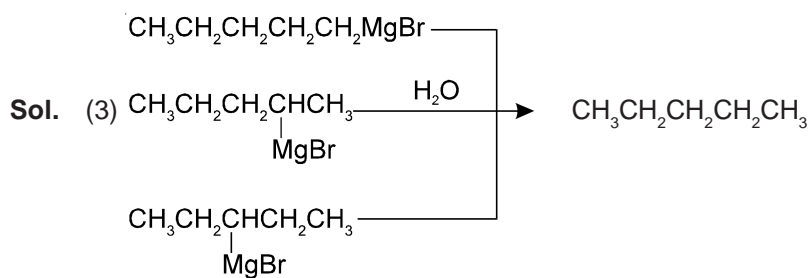
Ex-7 2-Pentyne can be converted into trans-pent-2-ene by reaction with -

- [1] H_2/Ni [2] $\text{H}_2/\text{Lindlar's catalyst}$ [3] $\text{Na/Liq} : \text{NH}_3$ [4] Zn/HCl .

Sol. (3) Sodium in the presence of liquid ammonia converts alkynes to corresponding cis-alkenes.

Ex-8 How many different isomeric compounds having molecular formula $\text{C}_5\text{H}_{11}\text{Br}$ on reaction with Mg, followed by hydrolysis can yield pentane -

- [1] 4 [2] 2 [3] 3 [4] 5



Ex-9 Which of the following compounds has the highest melting point -

- [1] n-Butane [2] n-Pentane [3] n-Hexane [4] n-Heptane

Sol. (4) n-Octane has the longest chain of carbon atoms.

Ex-10 Which of the following compounds has the highest boiling point -

- [1] Ethene [2] Propene [3] cis-2-Butene [4] trans-2-Butene

Sol. (3) cis-Isomer has higher boiling point than trans due to its greater polarity.

Ex-11 The density of a hydrocarbon at N.T.P. 2.5 gram/lit. what is hydrocarbon.

Sol. Density of 1 lit. hydrocarbon = 2.5 gram/lit

$$\therefore \text{Mol. wt. of H.C.} = 2.5 \times 22.4 = 56$$

After mol. wt. we calculate the molecular formula

$$\text{C}_n \text{H}_{2n+2} = \text{mol. wt. (Alkane)} \text{ or } 14n+2 = \text{mol. wt.}$$

$$\text{C}_n \text{H}_{2n} = \text{mol. wt. (Alkyne)} \text{ or } 14n = \text{mol. wt.}$$

$$\text{C}_n \text{H}_{2n-2} = \text{mol. wt. (Alkene)} \text{ or } 14n-2 = \text{mol. wt.}$$

with the help of above three formulae, we can identify the given H.C. $14n = 56$ (Alkene)

$$\therefore \text{Hydrocarbon is } \text{C}_4\text{H}_8$$

Ex-12 8 C.C. of gaseous hydrocarbon requires 40 C.C. of O_2 for complete combustion which is H.C.

Sol. Vol. of H.C. = 8 C.C. Vol. of O_2 = 40 c.c.

$$\text{Formula No. } 1 \frac{8}{40} = \frac{2}{3n-1} \text{ (for alkane)}$$

$$\frac{1}{10} = \frac{2}{3n+1} \text{ or } 3n + 1 = 20$$

$$3n = 20 - 1 = 19 \quad n = 6.33$$

The value of n comes in whole number from 1st formula it means hydrocarbon is Alkane and it is of 3C atom.

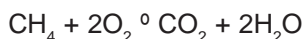
$$\therefore \text{Hydrocarbon is } \text{C}_3\text{H}_8 \text{ (Propane)}$$

Ex-13 10 ml of a mixture of CH_4 and C_3H_8 requires 41 ml. of oxygen for complete combustion. What is the vol. of CH_4 and C_3H_8 in the mixture.

Sol. Suppose the volume of CH_4 in $(\text{CH}_4 + \text{C}_3\text{H}_8)$ mix = x C.C.

= Vol. of C_3H_8 will be $10 - x$ C.C

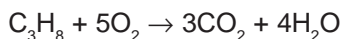
For CH_4



\therefore 1 Vol. of CH_4 requires 2 vol. of O_2 for complete combustion

\therefore x c.c. of CH_4 2x C.C. of O_2

For C_3H_8



\therefore 1 vol. of C_3H_8 requires 5 ml of O_2 for complete combustion

\therefore (10 - x) C.C. of C_3H_8 requires 5 (10 - x) C.C. of O_2

Total Vol. of $\text{O}_2 = 2x + 5(10 - x)$ it is equivalent to 41

(According to question)

Ans. Vol. of CH_4 is 3 c.c. and Vol. of C_3H_8 of 7 C.C.

Ex-14 If 5 gm $\text{C}_2\text{H}_5\text{I}$ reacts with Na (Metallic) in presence of ether, and the yield is 60% then how many grams of n-butane will you get.



Mol. wt. of $\text{C}_2\text{H}_5\text{I} = 24 + 5 + 127 = 156$

Mol. wt. of $\text{C}_4\text{H}_{10} = 48 + 10 = 58$

Two molecule of $\text{C}_2\text{H}_5\text{I}$ are taking part in above reaction

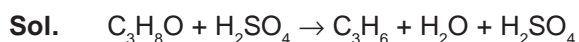
\therefore We get 58 gm. of C_4H_{10} from 2×156 gm of $\text{C}_2\text{H}_5\text{I}$

\therefore We get $\frac{58}{2 \times 156}$ gm. of C_4H_{10} from 1 gm of $\text{C}_2\text{H}_5\text{I}$

\therefore We get $\frac{58 \times 5}{2 \times 156}$ gm. of C_4H_{10} from 5 gm of $\text{C}_2\text{H}_5\text{I}$ yield in 60%

So the quantity of C_4H_{10} will be $\frac{58 \times 5}{2 \times 156} \times \text{gm} = 0.55$ gm.

Ex-15 How much propanol is required for, dehydration to get 2.24 lit. of Propene at N.T.P. if yield is 100%



Molecular wt. of propanol = 60

from the equation given above we can see that from dehydration of 1 mole or 60 gram of propanol we get 1 mole (22.4 lit.) of propene as product.

\therefore 22.4 lit. of C_3H_6 can be get from dehydration of 60 gm of propanol.

\therefore 1 lit. of propene can be get from dehydration of $\frac{60}{22.4}$ gm of propanol

∴ 2.24 lit. of propene can be get from dehydration of $\frac{60}{22.4} \times 2.24$ gm of propanol = 6 gm. Ans.

Ex-16 90 ml of oxygen is required for complet combustion of unsaturated 20 ml gaseous hydrocarbon, hydrocarbon is

Sol. Following two formulae can be used for solution of the above problem.

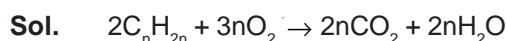
$$\frac{\text{Volume of Hydrocarbon}}{\text{Volume of O}_2} = \frac{2}{3n} \quad (\text{for Alkene})$$

$$\frac{\text{Volume of Hydrocarbon}}{\text{Volume of O}_2} = \frac{2}{3n-1} \quad (\text{for Alkyne})$$

By putting the values in above formulae we can find the hydrocarbon for which n is natural number

$$\frac{20}{90} = \frac{2}{3n} \quad n = 3 \text{ So hydrocarbon is alkene [C}_3\text{H}_6\text{]}$$

Ex-17 How many mole oxygen is required for complete combustion of 1 mole of Alkene.



keeping in mind, the above equation

∴ for 2 mole of alkene, 3n mole of O₂ is required for combustion

∴ for 1 mole of alkene, $\frac{3n}{2}\text{O}_2$ mole of O₂ is required for combustion.

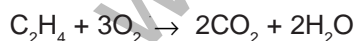
$$= 1.5n \text{ mole of O}_2$$

Ex-18 30 ml mixture of ethylene and Butylene is burnt in presence of oxygen then 150 ml of oxygen is required, what is the volume of Ethyleene & Butylene is mixture.

Sol. Let the volume of C₂H₄ = x ml

So volume of Butylene = (30 - x) ml

For C₂H₄

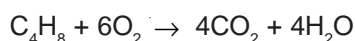


from equation

∴ for 1 volume C₂H₄, 3 volume of O₂ is required

∴ for x ml vol. of C₂H₄ , 3x ml volume of O₂ is require.

For C₄H₈



∴ for 1 volume C₄H₈, 6 volume of O₂ is required

∴ for (30 - x) ml “ “ , 6 (30 - x) ml of O₂ is requiried

Total volume of $O_2 = 3x + 6(30 - x)$ ml = 150 ml (given)

$$x = 10$$

\therefore Volume of C_2H_4 in mixture is 10 ml

\therefore Volume of C_2H_6 in mixture is 20 ml

Ex-19 The density of one hydrocarbon at N.T.P. is 1.964 gm/lit. Which hydrocarbon is this.

Ans. Mol. wt. of Hydrocarbon

$$= \text{density of 1 lit.} \times 22.4$$

$$= 1.964 \times 22.4$$

$$= 44$$

So mol. wt. of hydrocarbon = 44

So the hydrocarbon is C_3H_8 (Propane)

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