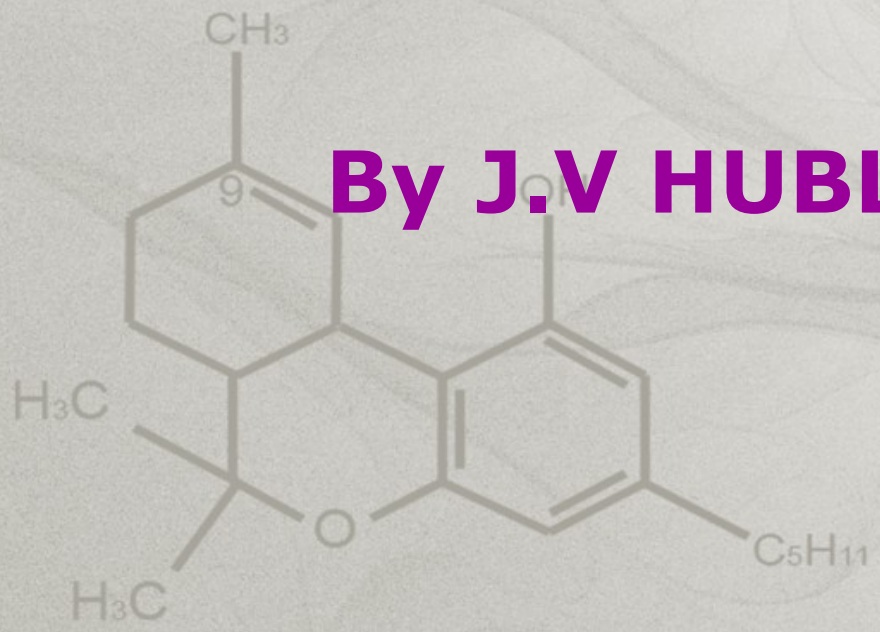
CHEMISTRY

By J.V HUBLIKAR



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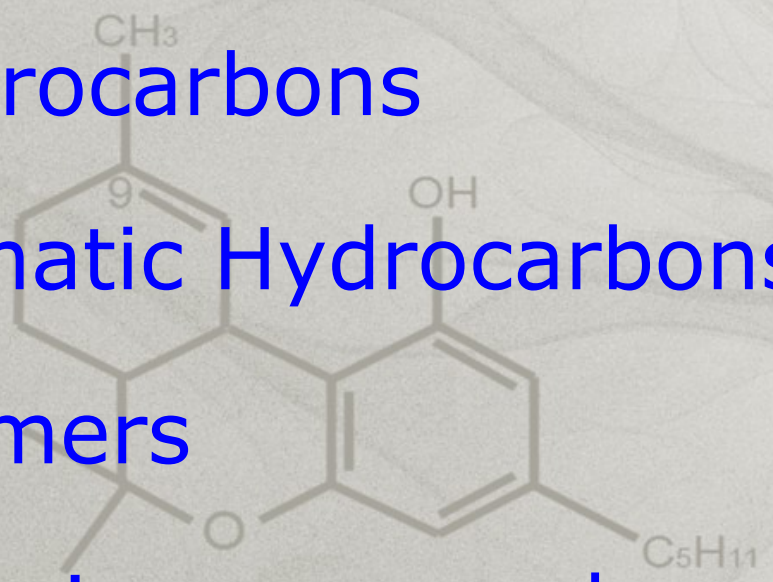
Topics :

- ✓Nomenclature of Organic Compounds
- ✓ Hydrocarbons
- ✓Aromatic Hydrocarbons
- ✓Polymers
- ✓Organic compound containing Oxygen-I



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1. Which of the following could act as propallent for rocket ?

1. Liquid N_2 + Liquid O_2
2. Liquid H_2 + Liquid N_2
3. Liquid O_2 + Liquid Argon
4. Liquid H_2 + Liquid O_2

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Ans : 4. Liquid H_2 + Liquid O_2

Reason : Liquid hydrogen has low molecular mass and high heat of combution while oxygen is supporter of combution. Thus liquid H_2 + liquid O_2 is used as good rocket propallent

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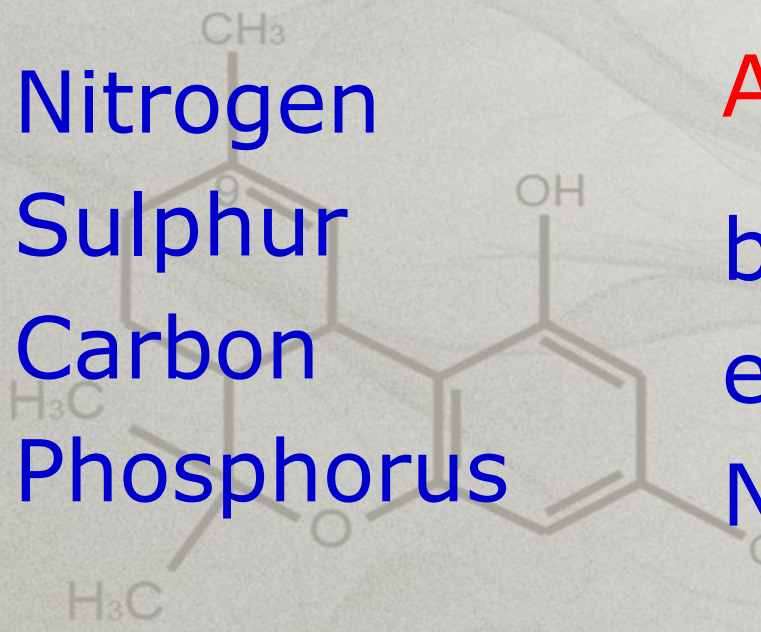
2. An element essentially found in all explosive is _____.

1. Nitrogen
2. Sulphur
3. Carbon
4. Phosphorus

Ans : 1. Nitrogen

because all explosive contain Nitrogen



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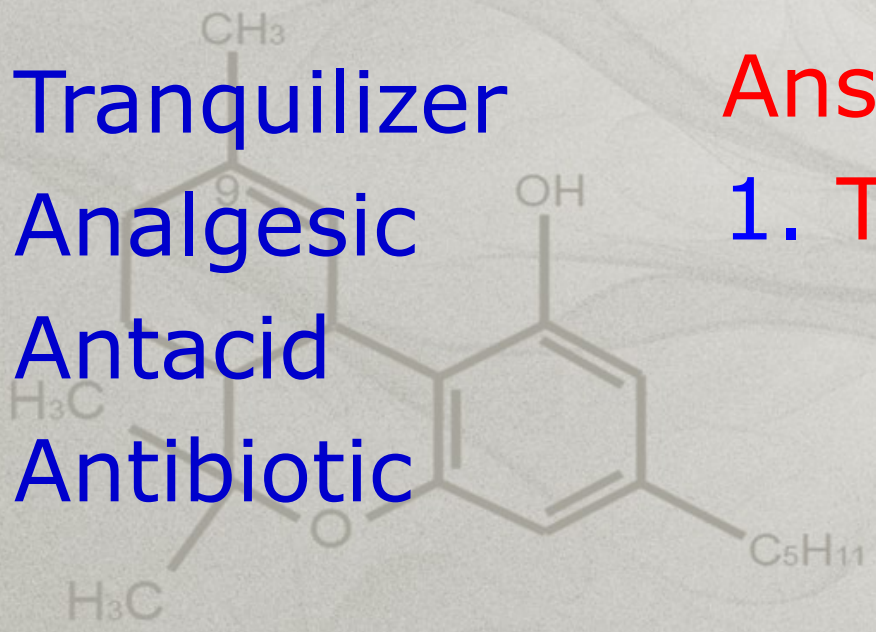
3. Drug which is used to reduce anxiety and brings calmness is known as _____

1. Tranquilizer
2. Analgesic
3. Antacid
4. Antibiotic



Ans :

1. Tranquilizer

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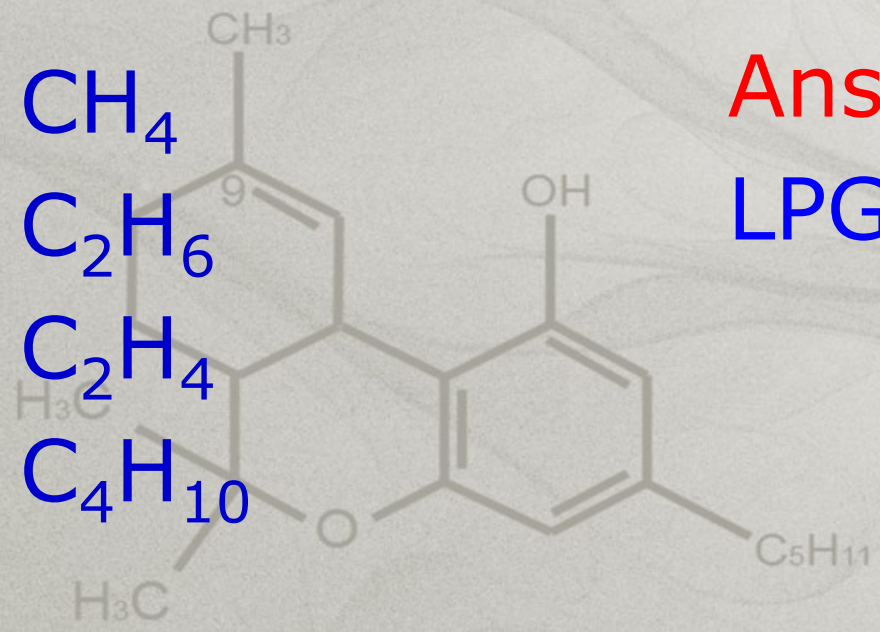
4. Household gaseous fuel (LPG) mainly contains _____.



1. CH_4
2. C_2H_6
3. C_2H_4
4. C_4H_{10}

Ans : 4. C_4H_{10}

LPG contains butane & isobutane

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5. In Lassaign's test, the organic compound is fused with a piece of sodium metal in order to

1. Increase the ionisation of the compound
2. Increase the reactivity of the compound
3. Converts the covalent compound into a mixture of ionic compound
4. Decrease the melting point of the compound

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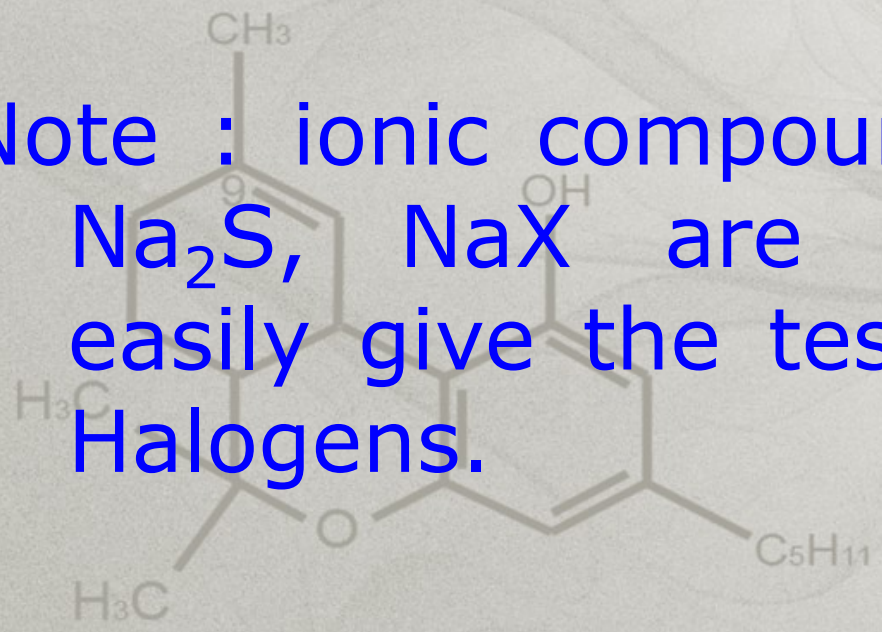
Ans : 3. convert the covalent compound into a mixture of ionic compound



Note : ionic compounds like NaCN, Na_2S, NaX are formed which easily give the test for N, S and Halogens.

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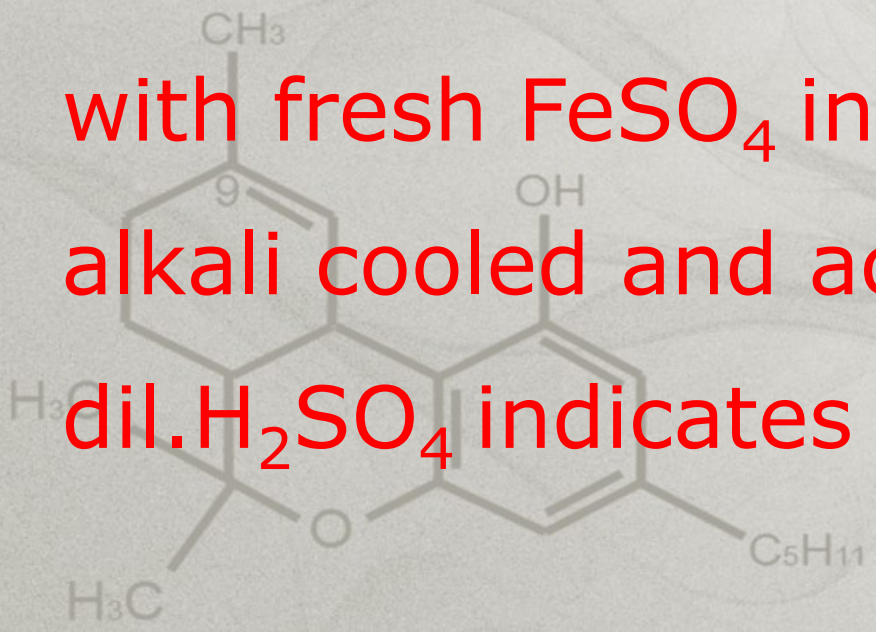
6. The blue colour developed when sodium fusion extract is heated with fresh $FeSO_4$ in presence of alkali cooled and acidified with dil.H_2SO_4 indicates _____.



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1. N, $Fe_4[Fe(CN)_6]_4$
2. N, $Na_4[Fe(CN)_6]$
3. S, $Na_4[Fe(CN)_5NOS]$
4. N+S, $Fe(CNS)_3$

Ans : 1.N, $Fe_4[Fe(CN)_6]_4$

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7. During the test for Halogen by Silver Nitrate test, the sodium extract is first boiled with few drops of HNO_3 to

1. decompose sodium halides present.
2. helps in the precipitation of AgCl.
3. increase the concentration of Nitrate ion.
4. Decompose Na_2S and NaCN if formed.

Ans :

4. Decompose Na_2S and NaCN if formed.

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8. In Kjeldahl's method, copper sulphate acts as

1. an Oxidising agent
2. a reducing agent
3. a catalytic agent
4. a hydrolysing agent

Ans :3. a catalytic agent

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9. In Liebig's method, for the estimation of carbon, the CO_2 produced is absorbed in the solution of

1. $Ca(OH)_2$
2. pyrogallol
3. KOH
4. Any one of these

Ans :3. KOH

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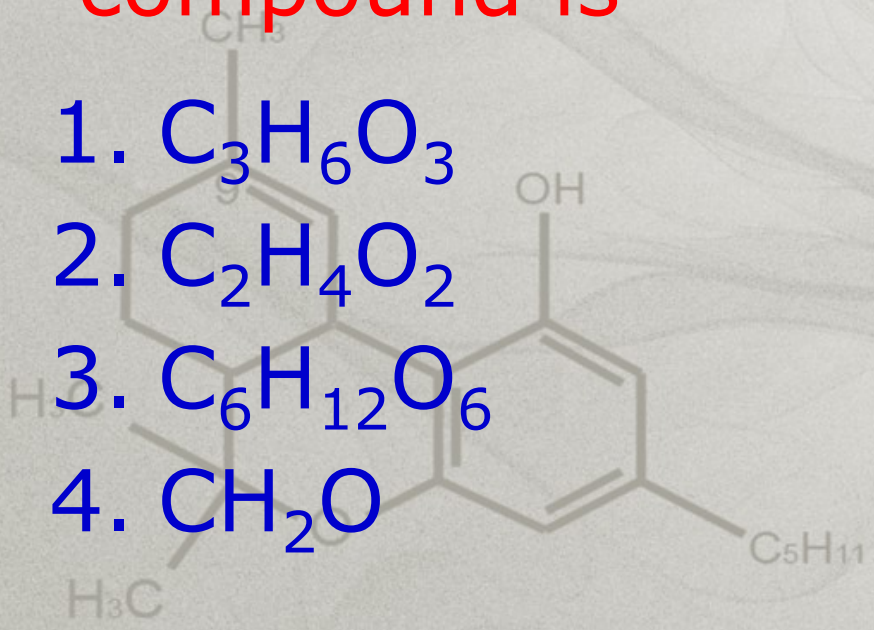
10. Empirical formula of a compound is CH_2O and its molecular mass is 90. The molecular formula of the compound is



1. $C_3H_6O_3$
2. $C_2H_4O_2$
3. $C_6H_{12}O_6$
4. CH_2O

Ans :1. $C_3H_6O_3$

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Note :

Empirical formula mass $= CH_2O$

$= 12+2+16=30$

$\therefore n = \text{molecular mass/emp. formula mass}$

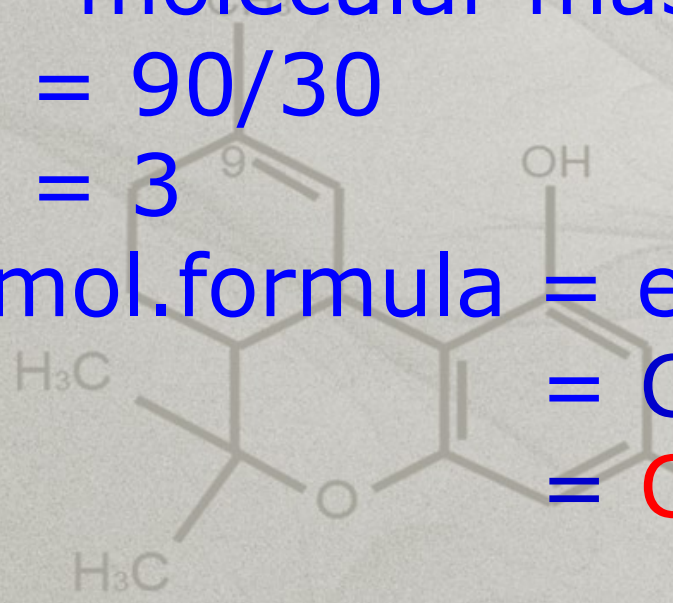
$= 90/30$

$= 3$

$\therefore$ mol.formula = emp.formula x n

$= CH_2O \times 3$

$= C_3H_6O_3$



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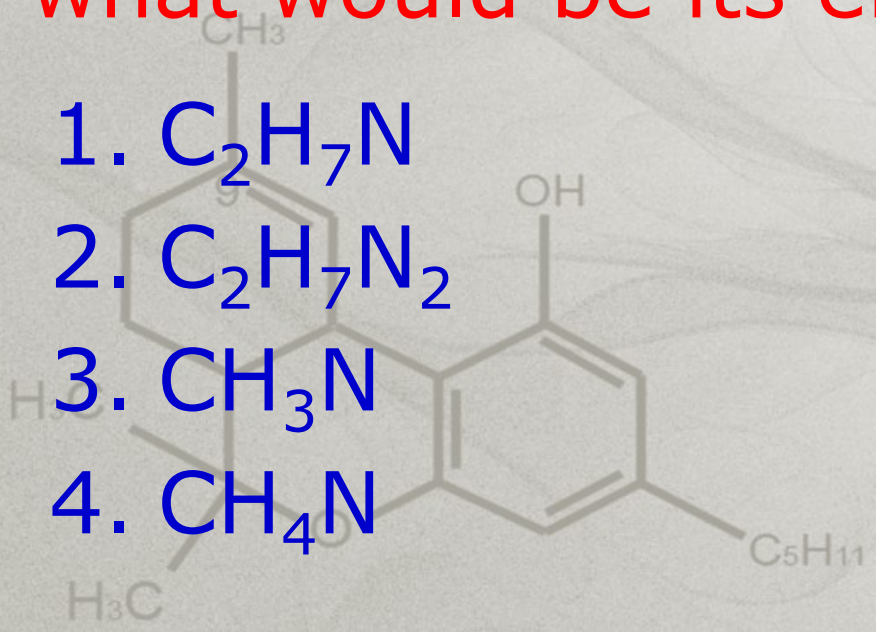
11. An Organic Compound contain C,H&N give following on analysis, C=40%, H=13.33% & N=46.67% what would be its empirical formula



1. C_2H_7N
2. $C_2H_7N_2$
3. CH_3N
4. CH_4N

Ans :4. CH_4N

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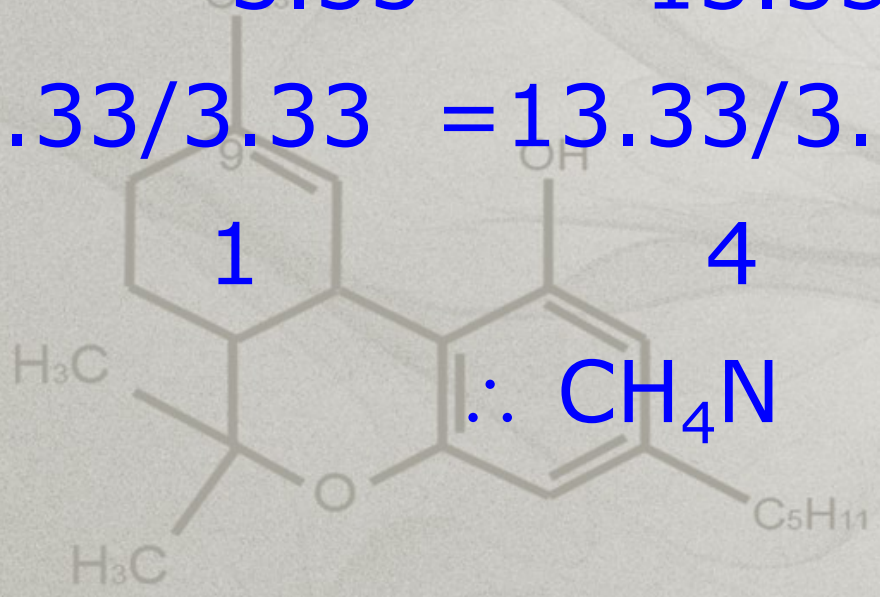
Note :	C	H	N
	40/12	13.33/1	46.67/14
	=3.33	=13.33	= 3.33
	=3.33/3.33	=13.33/3.33	=3.33/3.33
	1	4	1

$\therefore CH_4N$



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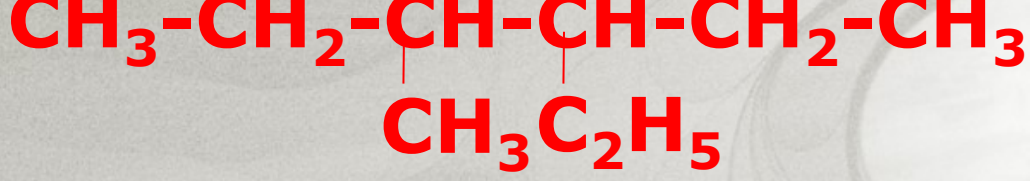
12. IUPAC Name of



is

1. 4-ethyl-3-methyl hexane
2. 3-ethyl-4-methyl hexane
3. Both of these
4. None of these

Ans : 2. 3-ethyl-4-methyl hexane

Note : If two different substituents are present at equivalent position from the two ends in the parent chain, then the numbering of parent chain is done, in such a way that substituent which comes first in the alphabetical order gets the lowest number.

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13. IUPAC Name of
CH_3-CH_2-C(Br)=CHCl is

1. 4-chloro-3-bromo but-3-ene
2. 2-bromo-1-chloro but-1-ene
3. 2-bromo-1-chloro butene-1
4. 2-bromo-2-ethyl-3-chloro propene

Ans : 2. 2-bromo-1-chloro but-1-ene

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14. IUPAC Name of
CH_3-CH(CH_3)=CH-COOH is

1. 2-methyl but-2-enoic acid
2. 3-methyl but-3-enoic acid
3. 3-methyl but-2-enoic acid
4. 2-methyl but-3-enoic acid

Ans : 3. 3-methyl but-2-enoic acid

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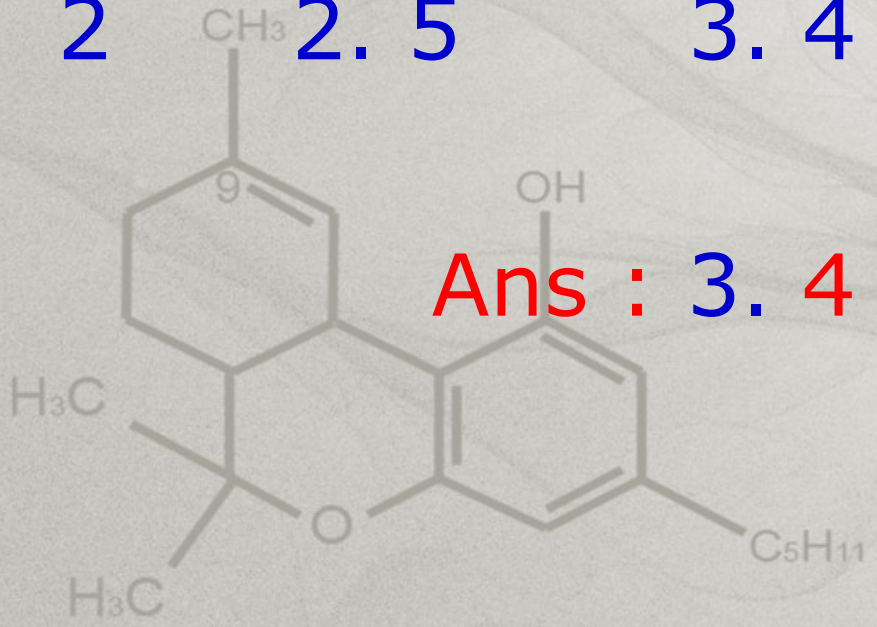
15. The number of Pi Bonds in $CH_2=CH-CH=C\equiv CH$ is

1. 2 2. 5 3. 4 4. 3



Ans : 3. 4

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Note :

(i)carbon-carbon double bond contains One Sigma bond and One Pi bond

(ii)carbon-carbon Triple bond contains one sigma bond & two Pi bonds.

(iii) Two double bond = 2 Pi-bonds

One Triple bond = 2 Pi-bonds

$\therefore$ Total Pi-bonds = 4

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16. Two members of the homologous series have

1. different general formula
2. different molecular weight
3. different methods of preparation
4. different chemical properties

Ans : 2. different molecular weight

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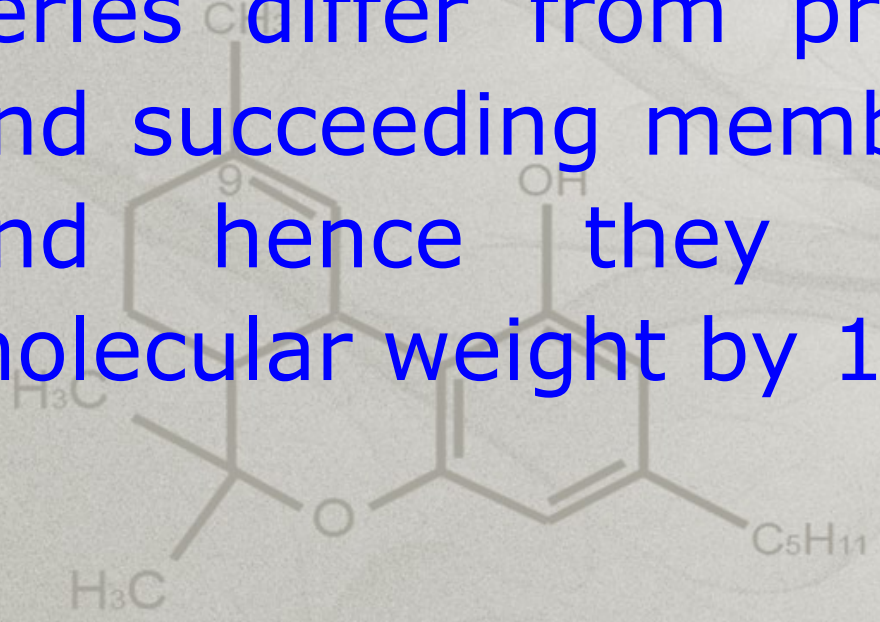
Note :

Each member of the homologous series differ from preceding member and succeeding member by CH_2 group and hence they differ in their molecular weight by 14.



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17. For the preparation of alkane, a concentrated aqueous solution of sodium or potassium salt of carboxylic acid is subjected to

1. Hydrolysis
2. Oxidation
3. Hydrogenation
4. Electrolysis

Ans : 4. Electrolysis

$$2RCOONa + 2H_2O \rightarrow R\text{-}R + 2CO_2\uparrow + 2NaOH + H_2\uparrow$$

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18. CH_3-CH(Br)-CH_3 → CH_3-CH=CH_2 this transformation is carried out in the presence of

1.aqu.KOH 2. H_2O

3.alc.KOH 4. H_2SO_4

Ans : 3.alc.KOH

Note :

Hydrogen & Bromine are eliminated,

∴ It is a dehydrohalogenation reaction.

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19. Photochemical chlorination of alkane is initiated by the process of

1. Pyrolysis
2. Substitution
3. Homolysis
4. Hetrolysis

Ans : 3. Homolysis

Note : $Cl{\cdot\cdot}Cl \longrightarrow Cl\cdot + Cl\cdot$

Chlorine free radical is formed by the homolysis of chlorine molecule.

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20. During the preparation of ethane by Kolbe's electrolytic method using inert electrodes the pH of the electrolyte

1. increases progressively as the reaction proceeds
2. decreases progressively as the reaction proceeds
3. remains constant throughout the reaction
4. may decrease if the concentration of electrolyte is not very high.

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Ans : 1.increases progressively as the reaction proceeds

Note :

$2CH_3COONa+2H_2O \rightarrow C_2H_6+2CO_2+2NaOH+H_2$

as the reaction proceeds formation of NaOH increases hence pH increases

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21. When Calcium salt of adipic acid is distilled and the product is reduced with Zn-Hg/HCl _____ is obtained.

1. Cyclopentanone
2. Cyclopentane
3. Cyclohexane
4. Cyclohexanone

Ans : 2. Cyclopentane

Calcium Adipate → Cyclopentanone

↓

Cyclopentane

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22. A hydrocarbon C_4H_8, neither decolourises bromine in CCl_4 sol^n, nor reacted with HBr when heated to 200^0C with hydrogen in the presence of Ni-catalyst, a new hydrocarbon C_4H_{10} was formed. What is the Name of original compound?

1. n-butane
2. cis-2-butene
3. Isobutylene
4. Cyclobutane

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Ans : 4. Cyclobutane

Note : Hydrocarbon C_4H_8

i) doesn't decolourise Br_2 in CCl_4

ii) doesn't react with HBr, means it is not an unsaturated open chain compound.

iii) It reacts with H_2 in presence of Ni-catalyst at 200^0c to form C_4H_{10} means it is a cyclic compound adds on H_2 and undergo ring opening reaction to form open chain compound n-butane.

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23. According to MarKownikoff's rule when hydrogenchloride adds on to unsymmetrical alkene the hydrogen of HCl attaches to

1. Carbon in the middle of the molecule.
2. Carbon at the end of the molecule
3. Carbon with most number of hydrogen
4. Carbon with least number of hydrogen

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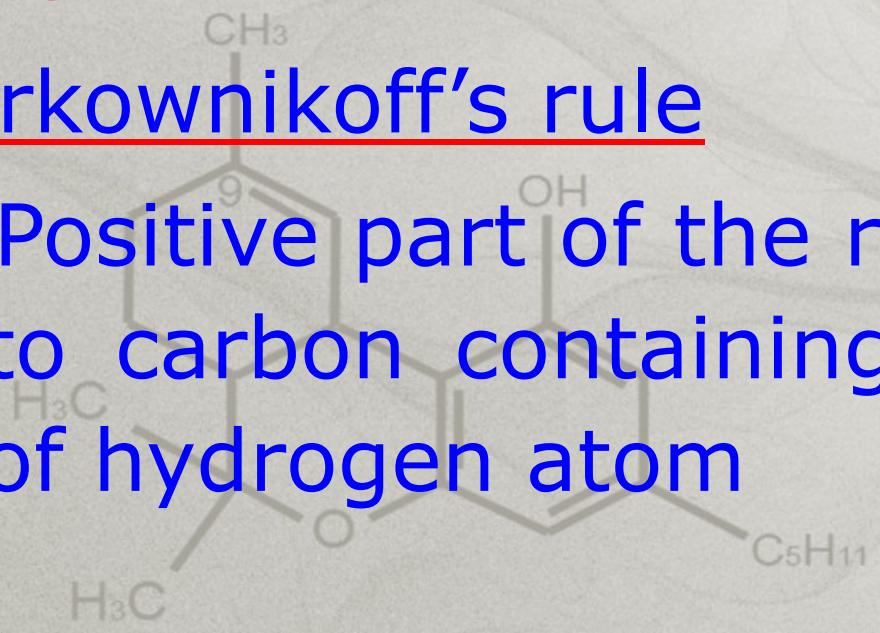
Ans : 3. Carbon with most number of hydrogen

Note :

Markownikoff's rule

Positive part of the reagent adds on to carbon containing more number of hydrogen atom



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24. A gas decolourises Alkaline $KMnO_4$ (Baeyer`s Regent) but does not give any precipitate with Ammonical $AgNO_3$ the gas is

1. Methane
2. Ethane
3. Ethene
4. Ethyne

Ans : 3. Ethene

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Note :

1. Unsaturation in organic – compound is tested by using following reagent
   - Alkaline $KMnO_4$ (Colour of $KMnO_4$ is decolourised)
   - Bromine water (Colour of Bromine water is decolourised)
   - Ozone (formation of Ozonide)

(Continued…)

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Note : (Continued…)

2. Ammonical $AgNO_3$ (Tollen's reagent) and Ammonical Cu_2Cl_2 are used to test acidic hydrogen atom in alkynes
3. Acidic Hydrogen atom is present at the end of the triple bonded carbon atom. It is due to the higher electro negativity of the SP–Hybridized Carbon Atom

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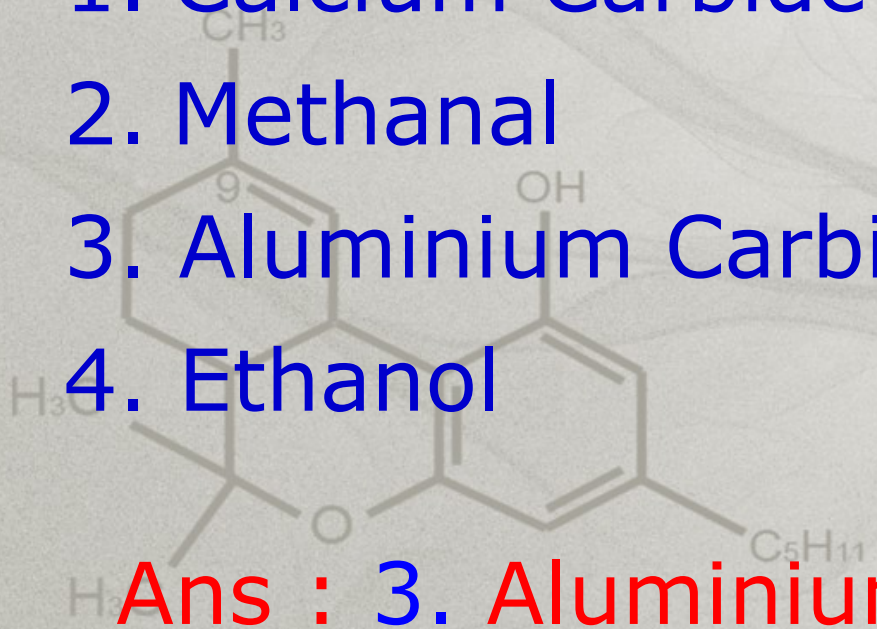
25. Methane is formed from the Hydrolysis of

1. Calcium Carbide
2. Methanal
3. Aluminium Carbide
4. Ethanol



Ans : 3. Aluminium Carbide

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Note :

1. $CaC_2 + 2H_2O \rightarrow Ca(OH)_2 + C_2H_2$
2. $Al_4C_3 + 12H_2O \rightarrow 4Al(OH)_3 + 3CH_4$
3. $H\text{-}CHO + H_2O \rightarrow$ No reaction
4. $C_2H_5OH + H_2O \rightarrow$ No reaction

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26.A Metallic Carbide on treatment with water gives a colourless gas which burns readily in air and gives a red precipitate with $Cu_2Cl_2+NH_4OH$ the gas is

1. Methane
2. Ethane
3. Ethene
4. Ethyne

Ans : 4. Ethyne (Acetylene)

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27. Addition of HI on double bond of Propene yields Isopropyle Iodide and not n–Propyl Iodide as the major product, because addition proceeds through

1. A more stable carbonium ion
2. A more stable carbanion
3. A more stable Free Radical
4. Nucleophile

Ans: 1. A more stable carbonium ion

Note :

$$CH_3–CH=CH_2+H^+$$

$$\downarrow$$

1) $CH_3–CH^+–CH_3$

Iso propyl carbonium ion(More stable)

2) $CH_3–CH_2–CH_2^+$

n-propyl carbonium ion(Less stable)

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28. Two jars A and B are filled with Hydrocarbons, Br_2 in CCl_4 is added to these jars A does not decolourise the Br_2 solution but B decolourises what are A and B

1. Alkane and Alkene
2. Alkene and Alkane
3. Alkene and Alkyne
4. Alkene & Benzene

Ans : 1. Alkane and Alkene

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29. Benzene reacts with Chlorine to form benzene Hexachloride in the presence of

1. Nickel
2. $Alcl_3$
3. Bright Sunlight
4. Zn

Ans : 3. Bright Sunlight

Note :

$C_6H_6 + 3Cl_2 \xrightarrow{\text{Bright sunlight}} C_6H_6Cl_6$ (BHC Insecticide)

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30. Which of the following is the main component of heavy oil fraction of coal tar

1. Cresol and Naphthol
2. Phenol
3. Toluene
4. β - Naphthylamine

Ans : 1. Cresol and Naphthol

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Note :

1. Light oil fraction 0^0 - 170^0 C	Benzene, Toluene, Xylene
2. Middle oil fraction 170^0 C - 230^0 C	Phenol, Naphthalene
3. Heavy oil fraction 230^0 C - 270^0 C	Cresols, Naphthols
4. Green oil fraction 270^0 C - 340^0C	Anthracene, Phenanthrene

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31. Benzene is less reactive than Ethene and Ethyne towards addition reaction. This is due to

1. Cyclic Nature
2. Delocalisation of π Electrons
3. SP^2 Hybridization
4. Presence of 3 – Double Bonds

Ans : 2. Delocalisation of π Electrons

Stability of Benzene is due to delocalisation of π - Electrons (resonance)

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32. Carbon in Benzene undergoes SP^2 Hybridization and the bond angle is 120^o. The shape of Benzene Molecule is

1. Linear
2. Planar Hexagonal
3. Pyramidal
4. Tetrahedral

Ans : 2. Planar Hexagonal

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33. Which of the following can be easily Sulphonated?

1. Benzene
2. Toluene
3. Nitrobenzene
4. Chlorobenzene

Ans : 2. Toluene

Note: The electron releasing CH_3 group in Toluene increases the electron density on benzene ring and hence facilitates the attack of Electrophile

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34. Toluene can be separated from Benzene by

1. Washing with Con H_2SO_4
2. Cooling in freezing mixture
3. Dissolving in Sodium Hydroxide
4. Steam distillation

Ans : 2. Cooling in freezing mixture

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35. Which of the products can not be obtained when Chlorine is passed into boiling Toluene

1. Benzyl Chlorine
2. Benzotrichloride
3. Benzal Chloride
4. O–Chlorotolune

Ans : 4. O–Chlorotolune

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Note:

Toluene

Sunlight, 110^0C ↓ Cl_2

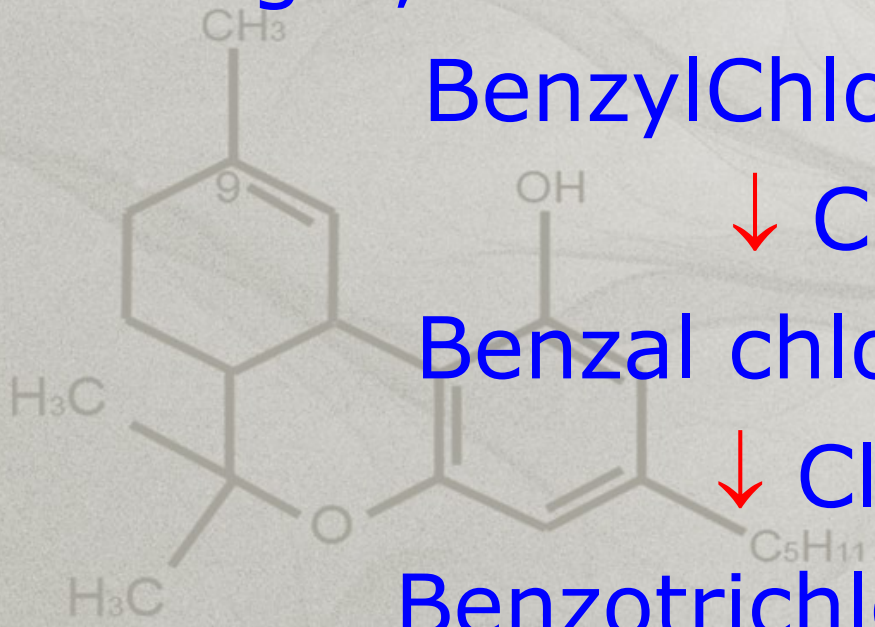
BenzylChloride

↓ Cl_2

Benzal chloride

↓ Cl_2

Benzotrichloride



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36. Rectified spirit gives absolute alcohol by

1. Fractional distillation
2. Azotropic distillation
3. Vaccum distillation
4. Steam distillation

Ans : 2. Azotropic distillation

i.e, by heating with quick lime (CaO)

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37. The enzymes which can catalyse the conversion of glucose to ethanol is

1. Zymase
2. Invertase
3. Maltase
4. Diastase

Ans : 1. Zymase

Note : Maltase – converts Maltose to Glucose

Invertase - converts Sucrose to Glucose & Fructose

Diastase – converts Starch to Maltose

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38. Most favourable condition for the alcoholic fermentation of sugar are

1. High conc^{n} of sol^{n}, Low temperature, plenty of air supply
2. Low conc^{n} of sol^{n}, moderate temperature, absence of air
3. Low conc^{n} of sol^{n}, Low temperature, plenty of air supply
4. None of the above

Ans :2. Low conc^{n} of Sol^{n}, moderate temperature, absence of air

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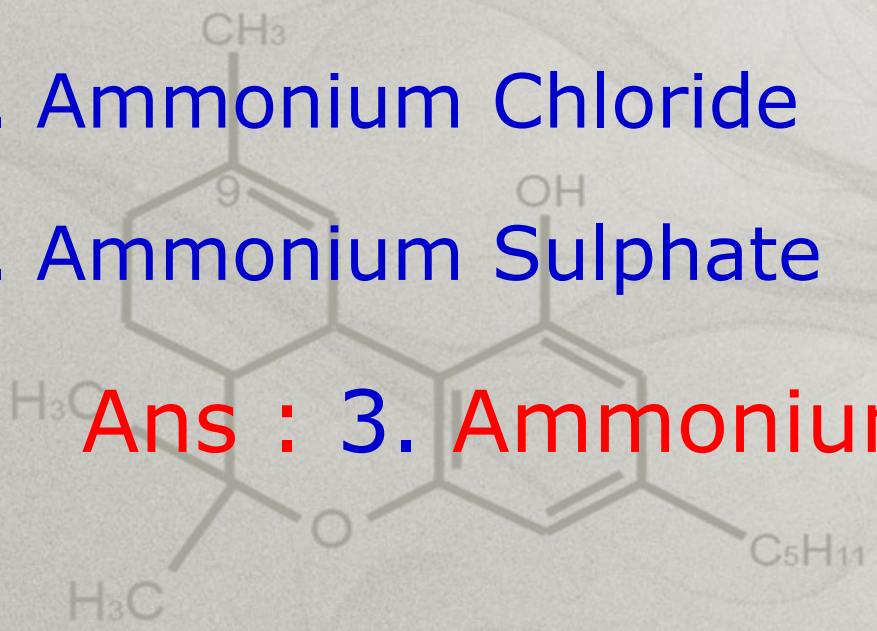
39. Which of the following compounds provides food to catalysts during alcoholic fermentation

1. Ammonium Chloride
2. Invertase
3. Ammonium Sulphate
4. Wine

Ans : 3. Ammonium Sulphate



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40. Power alcohol is a mixture of petrol and alcohol in the ratio of

1. 4 : 1
2. 1 : 4
3. 2 : 1
4. 1 : 2

Ans : 1. 4 : 1

Note : 80% petrol and 20% alcohol mixture is called power alcohol. - Fuel for internal combustion engines

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41. Ethyl alcohol exhibits acidic character on reacting with

1. Acetic acid
2. Sodium metal
3. Hydrogen chloride
4. Acidified $K_2Cr_2O_7$

Ans : 4. Acidified $K_2Cr_2O_7$

Note :

$$C_2H_5OH + 2[O] \xrightarrow{\text{acidified } K_2Cr_2O_7} CH_3COOH + H_2O$$

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42. In ethanol, the bond that undergoes hetrolysis during its esterification with CH_3COOH/H_2SO_4 is

1. C–C 2. C–O 3. O–H 4. C–H

Ans : 3. O–H

Note :

$$C_2H_5O\text{–}H + HO\text{–}COCH_3 \xrightarrow{\text{Conc. } H_2SO_4} C_2H_5OCOCH_3 + H_2O$$

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43. Wide spread deaths due to liquor poisoning is because of

1. Presence of bad compound in higher
2. Presence of methanol
3. Presence of Ethanol
4. Fermentation

Ans : 2. Presence of methanol

Note : Denatured alcohol-unfit for drinking purpose. Rectified spirit + 5% methanol +0.5% pyridine + colouring matter

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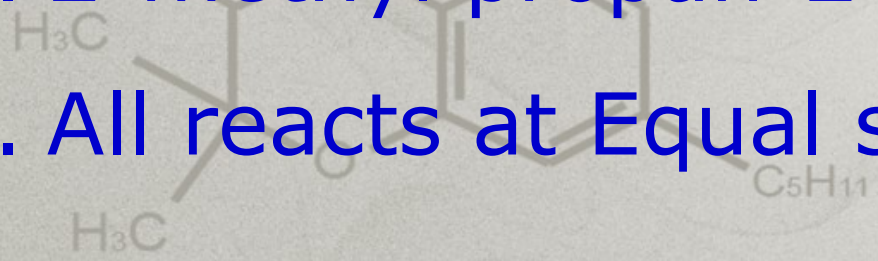
44. Which of the following will react fastest with Lucas reagent

1. Ethanol
2. Isopropyl alcohol
3. 2-methyl propan-2-ol
4. All reacts at Equal speed



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Ans : 3. 2-methyl propan-2-ol

Note :

Alcohol + HCl + anhydrous $ZnCl_2$→Alkylhalide

1. 3^0 alcohols react immediately to give turbidity
2. 2^0 alcohols react after some time to give turbidity
3. 1^0 alcohols reacts on heating to give turbidity

Order of reactivity of alcohol $3^0 > 2^0 > 1^0$

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45. Lucas test can be used to distinguish between

1. Methanol and Ethanol
2. Propan-1-ol & ethanol
3. Butan-1-ol and 2-methylpropan-2-ol
4. Ethanol and glycol

Continued ..

CHEMISTRY

Ans :

3. Butan-1-ol and 2-methylpropan-2-ol

Note :

Lucas test is to distinguish between 1^0, 2^0 & 3^0 alcohol

Butan-1-ol is a 1^0 alcohol

and

2-methyl-propan-2-ol is a 3^0 alcohol

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46. Ethanol is soluble in water due to

1. Its neutral nature
2. Dissociation in water
3. Hydrogen bonding
4. Ethyl group

Ans : 3. Hydrogen bonding

CHEMISTRY

47. An organic compound A containing C, H & O has a pleasant odour with boiling point of 90^0c on boiling A with conc.H_2SO_4, acolourless gas is produced which decolourises bromine water and alkaline $KMNO_4$. The organic compound A is

1. C_2H_5Cl
2. C_2H_5COOCH
3. C_2H_5OH
4. C_2H_6

Continued ..

CHEMISTRY

Ans : 3. C_2H_5OH

Note :

C_2H_5OH[Ethanol]

$\xrightarrow{\text{Conc. } H_2SO_4}$

C_2H_4 [Ethene]

↓

Ethene decolourises colour of Bromine water and alkaline $KMNO_4$

CHEMISTRY

48. The mixture of ether and alcohol is used as a petrol substitute under the name

1. Haloethane
2. Natalite
3. Proof spirit
4. Artificial camphor

Ans : 2. Natalite

CHEMISTRY

49. In Williamson's Synthesis Ethoxyethane is prepared by

1. Passing ethanol over heated Al_2O_3
2. Heating sodium ethoxide with Ethylbromide
3. Treating ethylalcohol with excess of H_2SO_4 at 440K
4. Heating ethanol with dry Ag_2O

Continued ..

CHEMISTRY

Ans : 2. Heating sodium ethoxide with Ethylbromide

Note :

Sodium Ethoxide + Ethyl bromide

$C_2H_5ONa + Br\text{-}C_2H_5$

↓

$C_2H_5—O—C_2H_5 + NaBr$

Diethyl ether

CHEMISTRY

50. When diethyl ether is treated with excess of Cl_2 in the presence of sun light, the product formed is :

1. $CH_3CHCl–O–CH_2CH_3$
2. $CH_3CHCl–O–CHClCH_3$
3. $CCl_3CCl_2–O–CCl_2CCl_3$
4. $CH_3CCl_2–O–CHClCH_3$

Ans : 3. $CCl_3CCl_2–O–CCl_2CCl_3$

CHEMISTRY

51. Which is formed when diethyl ether is heated with one mole of HI

1. Ethyl alcohol and ethyl iodide
2. Ethyl iodide only
3. Ethyl alcohol only
4. Ethyl iodide and ethane

Ans : 1. Ethyl alcohol and ethyl iodide

CHEMISTRY

52. An ether is more volatile than alcohol having the same molecular formula. This is due to

1. Intermolecular hydrogen bonding in ethers
2. Intermolecular hydrogen bonding in alcohols
3. Dipolar character of ethers
4. Alcohols having resonance structures.

Ans :

2. Intermolecular hydrogen bonding in alcohols

CHEMISTRY

Dear Students
ALL THE BEST