



CHEMISTRY

BOOKS - CENGAGE CHEMISTRY (HINGLISH)

PURIFICATION OF ORGANIC COMPOUNDS AND QUALITATIVE AND QUANTITATIVE ANALYSIS

Illustration

1. 0.2475 gm of an organic substance gave on combustion 0.495 gm of CO_2 and 0.2025 gm of H_2O . Calculate the percentage of carbon and hydrogen in it.



[Watch Video Solution](#)

2. 0.30 gm of an organic compound gave 50 mL of nitrogen collected at 300 K and 715 mm pressure in dumas method. Calculate the percentage of nitrogen in the compound

(Vapour pressure of water or aqueous tension of water at 300 K is 15 mm).



[Watch Video Solution](#)

3. 0.50 gm of an organic compound was treated according to Kjeldahl's method. The ammonia evolved was absorbed in 50 ml of 0.5 MH_2SO_4 . The residual acid required 60 ml of $\frac{M}{2}NaOH$ solution. Find the percentage of nitrogen in the compound.



[Watch Video Solution](#)

4. 0.4 gm of an organic compound was treated according to Kjeldahl's method. The ammonia evolved was absorbed in 50 ml of $0.5M H_3PO_3$. The residual acid required 30 ml of $0.5M Ca(OH)_2$. Find the percentage of N_2 in the compound.



[Watch Video Solution](#)

5. 0.002 gm of an organic compound was treated according to Kjeldahl's method.

0.2×10^{-4} mol of H_2SO_4 was required to neutralise NH_3 . Calculate the percentage of N_2



[Watch Video Solution](#)

6. 0.15 gm of an organic compound gave 0.12 gm of silver bromide by the carius method. Find the percentage of bromine in the compound.



[Watch Video Solution](#)

7. 0.2595 gm of an organic substance when treated by carius method gave 0.35 gm of $BaSO_4$. Calculate the percentage of sulphur in the compound?



[Watch Video Solution](#)

8. 0.12 gm of an organic compound containing phosphorus gave 0.22 gm of $Mg_2P_2O_7$ by the usual analysis. Calculate the percentage of phosphorus in the compound.



[Watch Video Solution](#)

9. 0.1693 gm of a volatile substance when vapourised displaced 58.9 cm of air measured at $27^{\circ}C$ and 746 mm pressure. Calculate the molecular mass of the substance. (Aqueous tension at $27^{\circ}C = 26.7\text{mmHg}$.)



[Watch Video Solution](#)

10. 0.16 gm of a dibasic organic acid required 25.0 ml of $\frac{N}{10}NaOH$ for complete neutralisation. Calculate its molecular mass.



Watch Video Solution

11. 0.45 gm of an organic compound gave on combustion 0.792 gm of CO_2 and 0.324 gm of water. 0.24 gm of the same substance was Kjeldahlised and the ammonia liberated was absorbed in 50.0 ml of $\frac{M}{8H_2SO_4}$. The excess acid required 77.0 ml of $\frac{N}{10}NaOH$ for complete neutralisation. Calculate the empirical formula of the compound.



Watch Video Solution

12. 0.246 gm of an organic compound containing 58.53% carbon and 4.06% hydrogen gave 22.4 ml of nitrogen at STP. What is the empirical formula of the compound?



[Watch Video Solution](#)

13. 0.76 gm of the silver salt of a dibasic acid was ignited. It gave 0.54 gm of pure silver. Determine the molecular mass of the acid.



[Watch Video Solution](#)

14. 0.984 gm of the chloroplatinate of a diacid base gave 0.39 gm of platinum. Calculate the molecular mass of the base.



[Watch Video Solution](#)

15. 0.246 gm of an organic compound gave 0.198 gm of carbon dioxide and 0.1014 gm of water on complete combustion. 0.37 gm of the compound gave 0.638 gm of silver bromide. What is the molecular formula of the compound if its vapour density is 54.4?



Watch Video Solution

16. On analysis, 0.2 gm of a monobasic acid gave 0.505 gm of CO_2 and 0.0864 gm of H_2O . 0.305 gm of this acid required 25ml of $\frac{N}{10} NaOH$ for complete neutralisation. Find the molecular formula of the acid.



Watch Video Solution

17. An acid of molecular mass 104 contains 34.6 % carbon and 3.45 % hydrogen. 3.812 mg

of the acid required 7.33 ml of 0.01 N $NaOH$ for neutralisation. Suggest a structure for the acid.



Watch Video Solution

18. A chloro compound (A) showed the following properties,

i. decolourised bromine in CCl_4

(ii). Absorbed hydrogen catalytically.

(iii). Gave a red precipitate with ammoniacal cuprous chloride soln. (iv). When vaporised 1.49 gm of (A) gave 448 ml of vapours at STP. Identify

(A) and write down the equation for the reaction in step 3.



[View Text Solution](#)

19. A hydrocarbon (A) of molecular weight 54 reacts with an excess of Br_2 in CCl_4 to give a compound (B) whose molecular weight is 593% more than that of (A). However, on catalytic hydrogenation with excess of hydrogen (A) forms (C) whose molecular weight is only 7.4% more than that of (A). (A) reacts with CH_3CH_2Br in the presence of $NaNH_2$ to give another

hydrocarbon (D) which on ozonolysis yields diketone (E). (E) on oxidation gives propionic acid. Give the structure of (A) to (E) with reason.



[View Text Solution](#)

20. A 20 ml mixture of CO , CH_4 , and Helium (He) gases is exploded by an electric discharge at room temperature with excess of oxygen. The volume contraction is found to be 13 ml. A further contraction of 14 ml occurs when the residual gas is treated with KOH solution. Find

out the composition of the gaseous mixture in terms of volume percentage.



[Watch Video Solution](#)

21. ninety five milliliters of a mixture of a gaseous organic compound (A) and just sufficient amount of oxygen required for the complete combustion yields on burning 40 ml of CO_2 and 70 ml of water vapour along with 10 ml of nitrogen all volumes measured at the same temperature and pressure. Compound (A) contains carbon, hydrogen and nitrogen only as

the constituent elements. Calculate:

(a). The volume of O_2 required for complete combustion

(b). The molecular formula of (A).



[Watch Video Solution](#)

22. An organic compound contains carbon, hydrogen and oxygen. IF the percentage of C: the percentage of $H = 6:1$, calculate the simplest formula of the compound, given that one molecule of the compound contains half as much oxygen as would be required to burn all

the carbon and hydrogen atoms in it to CO_2 and H_2O



Watch Video Solution

23. Fifty millilitre of a mixture of NH_3 and H_2 was completely decomposed into N_2 and H_2 by sparking. Forty millilitre of O_2 was then added and the mixture was sparked again. After cooling, the mixture was shaken with alkaline pyrogallol and a contraction of 6 ml was observed. Calculate the percentage of NH_3 in the original mixture.



Watch Video Solution

24. Ten millilitre of a gaseous hydrocarbon is exploded with 100 ml of oxygen. The residual gas on cooling is found to measure 95 ml. Of which 20 ml is absorbed by caustic soda and the remaining by alkaline pyrogallol. The formula of the hydrocarbon is:

- (a) CH_4
- (b) C_2H_6
- (c) C_2H_4
- (d) C_2H_2



Watch Video Solution

25. A mixture of formic acid and oxalic acid is heated with conc. H_2SO_4 . The gas produced is collected and treated with KOH solution where the volume decreases by $1/6$ th. The molar ratio of two acids (formic acid/oxalic acid) in the original mixture is:

- (a) 4 : 1
- (b) 1 : 4
- (c) 2 : 1
- (d) 1 : 2



[Watch Video Solution](#)

26. Nine millilitre of a mixture of methane and ethylene was exploded with 30 ml (excess) of oxygen. After cooling, the volume was 21.0 ml. Further treatment with caustic potash solution reduced the volume to 7.0 ml. Determine the composition of the mixture.



[Watch Video Solution](#)

27. 10 mL of a mixture of CH_4 , C_2H_4 and CO_2 was exploded with excess oxygen. After explosion, there was a contraction of 17 mL on cooling and there was a further contraction of 14 mL on treatment with KOH. Find out the composition of the mixture.



[Watch Video Solution](#)

28. An organic compound $C_xH_{2y}O_y$ was burnt with twice the amount of oxygen needed for complete combustion to CO_2 and H_2O . The

hot gases when cooled to $0^{\circ}C$ and 1 atm pressure, measured 2.24 litre. The water collected during cooling weighed 0.9 gm. the vapour pressure of pure water at $20^{\circ}C$ is 17.5 mm Hg and is lowered by 0.104 mm when 50 gm of the organic compound is dissolved in 1000 gm of water. Give the molecular formula of the organic compound.



[Watch Video Solution](#)

Solved Examples

1. Lassaigne's test is not shown by diazonium salts and hydrazines (NH_2NH_2). Why?



[Watch Video Solution](#)

2. Why a freshly prepared solution of $FeSO_4$ is used in Lassaigne's test for nitrogen ?



[Watch Video Solution](#)

3. How can a mixture of camphor and benzoic acid be separated without using column

chromatography?



Watch Video Solution

4. Explain the following:

(a) In sodium fusion test, why excess of sodium is taken?

(b) acetals give positive test with 2,4 dinitrophenylhydrazine..

(c) A polyhydroxy alcohol has the molecular weight of 168. On acetylation, the molecular weight increases to 294. Determine the number of ($-OH$) groups present in the alcohol.

(d) Chlorobenzene when treated with anhydrous AgNO_3 does not give white precipitate.



[View Text Solution](#)

5. (a) Two volatile compounds differ in their boiling points by 20 K, how will they be separated?

(b) What types of compounds are purified by sublimation?

(c) How will I_2 be separated from KCl ?

(d) How are *o*- and *p*- nitro phenols separated?

(e) How is aniline purified?

(f). How is a mixture of naphthalene and kerosene oil separated?



[Watch Video Solution](#)

6. (a) how is a mixture of two organic compounds separated, which have different solubilities in the same solvent?

(b) How is an organic liquid purified which decomposes below its boiling point?

(c) Why is sodium extract boiled with HNO_3 before testing for halogens?

(d) What type of organic compounds cannot be estimated by Kjeldahl's method?

(e). What does blood-red colouration during Lassaigne's test indicate?

(f). What happens when $AgNO_3$ solution is added to bromo methane?



[Watch Video Solution](#)

7. One litre of a mixture of CO and CO_2 is passed through red-hot charcoal. The volume now becomes 1.6 litre. Find the composition of the mixture by volume.



Watch Video Solution

8. Ten millilitre of a mixture of CO , CH_4 , and N_2 exploded with an excess of O_2 and gave a contraction of 6.5ml . When the residual gas was treated with $NaOH$, there was further contraction of 7 ml . What is the composition of the original mixture?



Watch Video Solution

9. Sixteen millilitre of a hydrocarbon gas was exploded with an excess of O_2 . On cooling, the volume of the resulting gaseous mixture was reduced by 48 ml. When KOH was added, there was a further decrease of 48 ml in volume. Find the molecular formula of the compound.



[Watch Video Solution](#)

10. An organic compound on analysis gave the following data:

(i). 0.25 gm of the compound on complete

combustion gave 0.37 gm of CO_2 and 0.2 gm of water.

(ii). 0.25 gm of the compound on analysis by Dumas method gave 32 ml of nitrogen gas at STP.

Calculate the percentages of C , H , N and O in the organic compounds.



[Watch Video Solution](#)

11. 1.216 gm of an organic compound was reacted under Kjeldahl's method and the ammonia evolved was absorbed in 100 ml

NH_2SO_4 . The remaining acid solution was made up to 500 ml by the addition of water. Twenty millilitres of the dilute solution required 32 ml $\frac{N}{10}$ caustic soda solution for complete neutralisation. Calculate the percentage of nitrogen in the compound.



[Watch Video Solution](#)

12. 0.1170 gm of an organic compound on heating with conc. HNO_3 and silver nitrate in Carius furnace gave 0.42 gm of $AgCl$. Find the percentage of chlorine in the compound.



Watch Video Solution

13. In a Victor Meyer's determination the following observation were made:



Watch Video Solution

14. 2.65gm of a diacidic base was dissolved in 500 ml of water. Twenty millilitres of this solution required 12 ml of $\frac{N}{6}$ HCl solution. Calculate the equivalent mass and molecular mass of the base.



[Watch Video Solution](#)

15. 0.49 gm of chloroplatinate of a diacidic base gave on ignition 0.195 gm of platinum. Calculate the molecular mass of the base.



[Watch Video Solution](#)

16. 0.38 gm of a silver salt of a dibasic acid on ignition gave 0.27 gm of silver. Calculate the molecular mass of the acid.



[Watch Video Solution](#)

17. Fifty millilitres of pure and dry O_2 was subjected to silent electric discharge and on cooling to the original temperature, the volume of the ozonised oxygen was found to be 47 ml. The gas was then absorbed in turpentine oil the volume of the remaining gas was found to be 41 ml. Find the molecular formula of ozone.



Watch Video Solution

1. When 100 ml of $O_2 - O_3$ mixture was passed through turpentine oil, there was reduction of volume by 20 ml. If 100 ml of such a mixture is heated, what will be the increase in the volume?



[Watch Video Solution](#)

2. fifty millilitre of a mixture of CO and CH_4 was exploded with 85 ml of O_2 . The volume of CO_2 produced was 50 ml. Calculate the percentage composition of the gaseous mixture.



Watch Video Solution

3. Ten millilitre of a gaseous hydrocarbon is was exploded with oxygen. After the explosion, there was a contraction of 20 ml in volume. On shaking the residual gaseous mixture with KOH , there was a further contraction of 20 ml in volume. Calculate the molecular formula. All the volumes were recorded at same temperature and pressure.



Watch Video Solution

4. An organic substance (0.2115gm) on complete combustion gave 0.4655 gm of carbon dioxide and 0.2533 gm of water. Determine the percentage composition of the compound.



[Watch Video Solution](#)

5. 0.92 gm of an organic compound containing carbon, hydrogen, and oxygen was analysed by combustion method. The increase in the mass of the U-tube and the potash bulbs at the end of the operation was found to be 1.08 gm and

1.76 gm respectively. Determine the percentage composition of the compound.



[Watch Video Solution](#)

6. An organic compound was analysed by dumas method. 0.45 gm of the compound on combustion gave 48.6 ml nitrogen at $27^{\circ}C$ and 756 mm pressure. Calculate the percentage composition of the compound.



[Watch Video Solution](#)

7. 0.2 gm of an organic compound was analysed by kjeldahl's method the ammonia evolved was absorbed in 60 ml $\frac{N}{5}H_2SO_4$. Unused acid required 40 ml of $\frac{N}{10}NaOH$ for complete neutralisation. Find the percentage of nitrogen in the compound.



[Watch Video Solution](#)

8. 0.156 gm of an organic compound on heating with fuming HNO_3 and $AgNO_3$ gives 0.235 gm

of AgI . Calculate the percentage of iodine in the compound.



Watch Video Solution

9. 0.5264 gm silver bromide is obtained from 0.5124 gm of an organic compound. Calculate the percentage of bromine in the compound.



Watch Video Solution

10. A Dumas bulb full of air weighs 22.567 gm at 20°C and 755 mm pressure. Full of vapours of a substance at 120°C and the same pressure. It weighs 22.8617 gm. The capacity of the bulb is 200 ml. Find out the molecular mass of the substance. [density of air = $0.00129\frac{\text{gm}}{\text{ml}}$]



[Watch Video Solution](#)

11. 1.575 gm of an organic acid was dissolved in 250 ml of water. Further, 20 ml of this solution required 16 ml of $\frac{N}{8}$ alkali solution for

complete neutralisation. If the basicity of the acid is 2, find its molecular mass.



[Watch Video Solution](#)

Concept Application Type

1. Describe the method to separate two compounds with different solubilities in a solvent S.



[View Text Solution](#)

2. What is the different between distillation distillation under reduced pressure, and steam distillation?



[View Text Solution](#)

3. Why is nitric acid added to sodium extract before adding silver nitrate for testing halogens?



[Watch Video Solution](#)

4. Explain the reason for the fusion of an organic compound with metallic sodium for testing nitrogen, sulphur and halogens



[Watch Video Solution](#)

5. Name a suitable technique of the components from a mixture of calcium sulphate and camphor.



[Watch Video Solution](#)

6. Explain why an organic liquid vaporises at a temperature below its boiling point in steam distillation?



[Watch Video Solution](#)

7. Will CCl_4 give white precipitate of $AgCl$ on heating with nitrate? Give reason for your answer



[Watch Video Solution](#)

8. Why is solution of potassium hydroxide used to absorb carbon dioxide evolved during the estimation of carbon present in an organic compound?

 [Watch Video Solution](#)

9. Why is it necessary to use acetic acid and not sulphuric acid for the acidification of sodium extract for testing sulphur by lead acetate test?

 [Watch Video Solution](#)

10. An organic compound contains 69 % carbon and 4.8 % hydrogen, the remainder being oxygen. Calculate the masses of carbon dioxide and water produced when 0.20 gm of this substance is subjected to complete combustion.



Watch Video Solution

11. A sample of 0.50 gm of an organic compound was treated according to Kjeldahl's method the ammonia evolved was absorbed in 50 ml of 0.5M H_2SO_4 . The residual acid required 60 cm

of 0.5M solution of $NaOH$ for neutralisation.

Find the percentage composition of nitrogen in the compound.



[Watch Video Solution](#)

12. 0.3080 gm of an organic chloro compound gave 0.5740 gm of silver chloride in a silver estimation. Calculate the percentage of chloride present in the compound



[Watch Video Solution](#)

13. In the estimation of sulphur by carius method, 0.468 gm of an organic sulphur compound afforded 0.668 gm of barium sulphate. Find out the percentage of sulphur in the given compound.



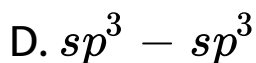
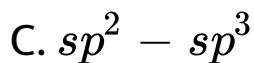
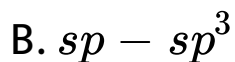
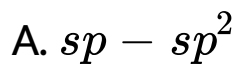
[Watch Video Solution](#)

14. In the organic compound

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

pair of hybridised orbitals involved in the

formation of $C_2 - C_3$ bond is

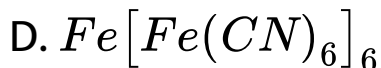
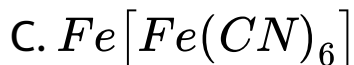
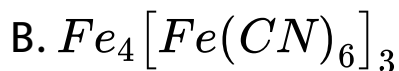
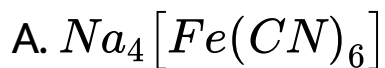


Answer: C



Watch Video Solution

15. In the Lassaigne's test for nitrogen in an organic compound, the Prussian blue colour is obtained due to the formation of:

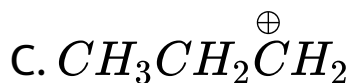
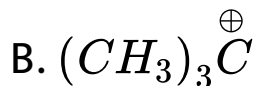
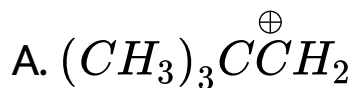


Answer: B



Watch Video Solution

16. Which of the following carbocation is most stable?



Answer: B



Watch Video Solution

17. The best and latest technique for isolation, purification, and separation of organic compounds is

A. crystallisation

B. distillation

C. sublimation

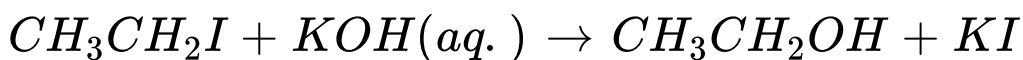
D. chromatography

Answer: D



View Text Solution

18. the reaction:



is classified as:

A. Electrophilic substitution

B. Nucleophilic substitution

C. Elimination substitution

D. elimination

Answer: B

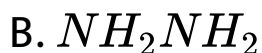
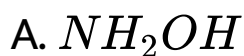


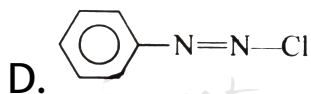
Watch Video Solution

Linked Comprehension Type

1. Qualitative analysis of organic compounds is performed by Lassaigne's test by fusion with metallic sodium, by which the covalent compounds are converted into ionic compounds. Extra elements like N, S, P and halogens are detected by their usual tests.

Q. Which of the following compounds will give positive Lassaigne's test for nitrogen



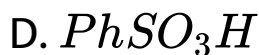
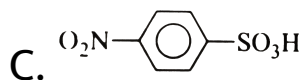
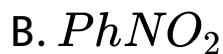
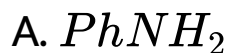


Answer: C

 [Watch Video Solution](#)

2. Qualitative analysis of organic compounds is performed by Lassaigne's test by fusion with metallic sodium, by which the covalent compounds are converted into ionic compounds. Extra elements like N , S , P and halogens are detected by their usual tests.

Q. Which of the following will give blood-red colour in lassaigne's test for nitrogen



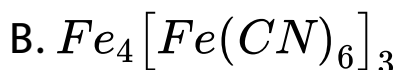
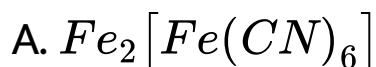
Answer: C

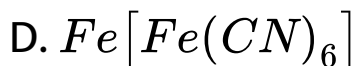
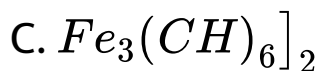


Watch Video Solution

3. Qualitative analysis of organic compounds is performed by Lassaigne's test by fusion with metallic sodium, by which the covalent compounds are converted into ionic compounds. Extra elements like N, S, P and halogens are detected by their usual tests.

Q. Prussian blue colour in the detection of nitrogen in Lassaigne's test is due to the formation of:





Answer: B

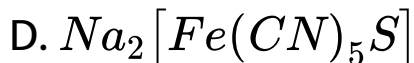
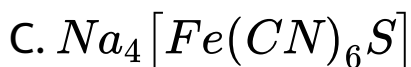
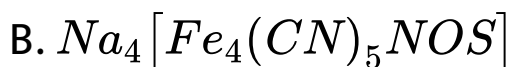
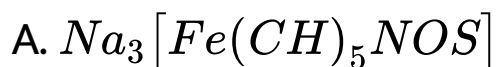


Watch Video Solution

4. Qualitative analysis of organic compounds is performed by Lassaigne's test by fusion with metallic sodium, by which the covalent compounds are converted into ionic compounds. Extra elements like N, S, P

and halogens are detected by their usual tests.

Q. Violet colour in the detection of sulphur with sodium nitroprusside is due to the formation of



Answer: B

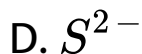


Watch Video Solution

5. Qualitative analysis of organic compounds is performed by Lassaigne's test by fusion with metallic sodium, by which the covalent compounds are converted into ionic compounds. Extra elements like N, S, P and halogens are detected by their usual tests.

Q. An organic compound containing N, S and O as extra elements is fused with metallic sodium and then extracted with distilled water. Which species is not present in the Lassaigne's





Answer: A



Watch Video Solution

6. Qualitative analysis of organic compounds is performed by Lassaigne's test by fusion with metallic sodium, by which the covalent compounds are converted into ionic

compounds. Extra elements line N, S, P and halogens are detected by their usual tests.

Q. The Lassaigne's extract is boiled with dil. HNO_3 before testing for halogens because

A. $AgCN$ is soluble in HNO_3

B. Silver halides are soluble in HNO_3

C. $NaCN$ and Na_2S are decomposed by HNO_3

D. Ag_2S is soluble in HNO_3

Answer: C



Watch Video Solution

7. Qualitative analysis of organic compounds is performed by Lassaigne's test by fusion with metallic sodium, by which the covalent compounds are converted into ionic compounds. Extra elements like N , S , P and halogens are detected by their usual tests.

Q. Black precipitate in the detection of sulphur with lead acetate and acetic acid is due to the formation of:

A. Pb_2S

B. PbS

C. PbS_2

D. $PbSO_4$

Answer: B



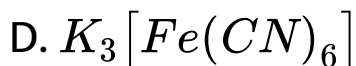
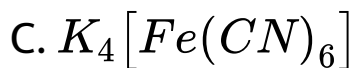
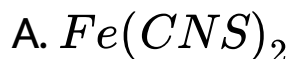
Watch Video Solution

8. Qualitative analysis of organic compounds is performed by Lassaigne's test by fusion with metallic sodium, by which the covalent compounds are converted into ionic

compounds. Extra elements line N, S, P

and halogens are detected by their usual tests.

Q. Blood-red colour in the detection of both N and S in Lassaigne's extract is due to the formation of :



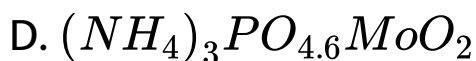
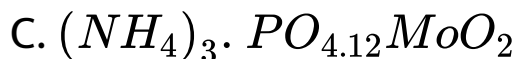
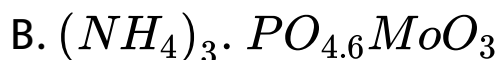
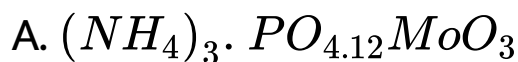
Answer: B



Watch Video Solution

9. Qualitative analysis of organic compounds is performed by Lassaigne's test by fusion with metallic sodium, by which the covalent compounds are converted into ionic compounds. Extra elements like N , S , P and halogens are detected by their usual tests.

Q. Yellow precipitate in the detection of phosphorous when an organic compound is heated with Na_2O_2 and then boiled with conc. HNO_3 followed by the addition of ammonium molybdate is due to the formation of :



Answer: A



Watch Video Solution

10. Qualitative analysis of organic compounds is performed by Lassaigne's test by fusion with metallic sodium, by which the covalent

compounds are converted into ionic compounds. Extra elements N, S, P and halogens are detected by their usual tests.

Q. Beilstein test is given by:

A. $RX(X=Cl, Br, I)$

B. Urea

C. Thiourea

D. All

Answer: D



Watch Video Solution

11. Quantitative estimation of C , H and extra elements (e.g., N.S.P., and halogens) is carried out by Liebig's combustion, Carius, Dumas, and Kjeldahl's method.

Q. Liebig's combustion method is used for the quantitative estimation of :

A. C and H

B. Halogens

C. S and P

D. N

Answer: A



Watch Video Solution

12. Quantitative estimation of C , H and extra elements (e.g., N.S.P., and halogens) is carried out by Liebig's combustion, Carius, Dumas, and Kjeldahl's method.

Q. Carius method is used for the quantitative estimation of:

A. C and H

B. Halogens, S, and P

C. N

D. all

Answer: B



Watch Video Solution

13. Quantitative estimation of C , H and extra elements (e.g., N, S, P, and halogens) is carried out by Liebig's combustion, Carius, Dumas, and Kjeldahl's method.

Q. Dumas and Kjeldahl's method are used for the quantitative estimation of

A. C and H

B. Halogen, S, And P

C. N

D. All

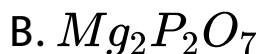
Answer: C



Watch Video Solution

14. Quantitative estimation of C , H and extra elements (e.g., N.S.P., and halogens) is carried out by Liebig's combustion, Carius, Dumas, and Kjeldahl's method.

Q. In Carius method for the quantitative estimation of phosphorus by using magnesia mixture, phosphorus is estimated by:



D. All

Answer: B



Watch Video Solution

15. Quantitative estimation of C , H and extra elements (e.g., N.S.P., and halogens) is carried out by Liebig's combustion, Carius, Dumas, and Kjeldahl's method.

Q. In Carius method for the quantitative estimation of sulphur, it is estimated by:

A. BaS

B. $CaSO_4$

C. $BaSO_4$

D. $BaCl_2$

Answer: C



Watch Video Solution

16. Quantitative estimation of C , H and extra elements (e.g., N.S.P., and halogens) is carried out by Liebig's combustion, Carius, Dumas, and

Kjeldahl's method.

Q. Carius is the name of:

A. A chemist

B. A biologist

C. A sealed capillary tube

D. A long necked round bottom flask

Answer: C



Watch Video Solution

17. Quantitative estimation of C , H and extra elements (e.g., N.S.P., and halogens) is carried out by Liebig's combustion, Carius, Dumas, and Kjeldahl's method.

Q. Kjeldahl's is the name of

A. A scientist

B. A round Bottom flask

C. A sealed capillary tube

D. A long necked round bottom flask

Answer: D



18. Quantitative estimation of C , H and extra elements (e.g., N.S.P., and halogens) is carried out by Liebig's combustion, Carius, Dumas, and Kjeldahl's method.

Q. In the quantitative estimation of phosphorous by using magnesia mixture, the formula used is: Where W is the mass of $Mg_2P_2O_7$ and w is the mass of the compound.

$$\text{A. Percentage of } P = \frac{62}{222} \times \frac{W \times 100}{w}$$

$$\text{B. Percentage of } P = \frac{31}{222} \times \frac{W \times 100}{w}$$

$$\text{C. Percentage of } P = \frac{62}{222} \times \frac{w \times 100}{W}$$

$$\text{D. Percentage of } P = \frac{31}{222} \times \frac{w \times 100}{W}$$

Answer: A



Watch Video Solution

19. Quantitative estimation of C , H and extra elements (e.g., N.S.P., and halogens) is carried out by Liebig's combustion, Carius, Dumas, and Kjeldahl's method.

Q. In the quantitative estimation of phosphorous by using ammonium molybdate, the formula used is: Where W is the mass of ammonium phospho molybdate and w is the mass of the compound.

$$\text{A. Percentage of P} = \frac{31}{1877} \times \frac{W \times 100}{w}$$

$$\text{B. Percentage of P} = \frac{62}{1877} \times \frac{W \times 100}{w}$$

$$\text{C. Percentage of P} = \frac{31}{1877} \times \frac{w \times 100}{W}$$

$$\text{D. Percentage of P} = \frac{62}{1877} \times \frac{w \times 100}{W}$$

Answer: A



Watch Video Solution

20. Quantitative estimation of C , H and extra elements (e.g., N.S.P., and halogens) is carried out by Liebig's combustion, Carius, Dumas, and Kjeldahl's method.

Q. In the quantitative estimation of oxygen by using I_2O_5 . The formula used is:

Where W is the mass of CO_2 and w is the mass of the compound.



[Watch Video Solution](#)

21. Twenty millilitres of a gaseous hydrocarbon required 400 ml of air for complete combustion. The air contains 20% by volume of oxygen and after explosion and cooling was found to be 380 ml.

Q. Volume of O_2 used is:

A. 70 ml

B. 75 ml

C. 80 ml

D. 85 ml

Answer: C



Watch Video Solution

22. Twenty millilitres of a gaseous hydrocarbon required 400 ml of air for complete combustion. The air contains 20% oxygen by volume and after explosion and cooling was found to be 380 ml.

Q. volume of residual nitrogen is:

A. 300 ml

B. 310 ml

C. 320 ml

D. 330 ml

Answer: C



Watch Video Solution

23. Twenty millilitres of a gaseous hydrocarbon required 400 ml of air for complete combustion. The air contains 20% by explosion and cooling was found to be 380 ml.

Q. Volume of O_2 is:

A. 40 ml

B. 60 ml

C. 80 ml

D. 100 ml

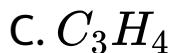
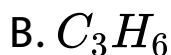
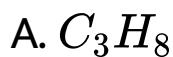
Answer: B



Watch Video Solution

24. Twenty millilitres of a gaseous hydrocarbon required 400 ml of air for complete combustion. The air contains 20% oxygen by volume and cooling was found to be 380 ml.

Q. Formula of the hydrocarbon is:



Answer: C

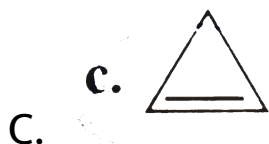
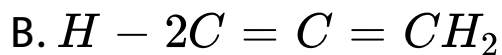
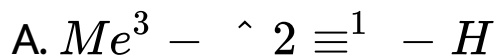


Watch Video Solution

25. Twenty millilitres of a gaseous hydrocarbon required 400 ml of air for complete combustion. The air contains 20 % by explosion and cooling

was found to be 380 ml.

Q. The structure of hydrocarbon is:



D. all

Answer: D



Watch Video Solution

Multiple Correct Answers Type

1. Which of the following statements is/are correct?

A. Aluminium wire is used in Beilstein test.

B. Nitrogen gas is quantitatively estimated in dumas method.

C. In Kjeldahl's method organic compound is reacted with conc. H_2SO_4 , K_2SO_4 and $NaSO_4$ are also added.

D. All organic compounds contains both C
and H.

Answer: B



Watch Video Solution

2. Which of the following statements is/are
wrong?

A. Sulphur is estimated by Caius method as



B. Victor Meyer's method is used for the determination of molecular mass of a non-volatile compound.

C. Kjeldahl's method is used for all nitrogen-containing organic compounds.

D. Phosphorous is estimated by Carius method as $Mg(NH_4).PO_4$.

Answer: C::D



Watch Video Solution

3. Which of the following statements is/are correct?

A. Liebig's method is used for the quantitative estimation of both C and H.

B. Dumas method is used for the quantitative estimation of N in all nitrogen-containing organic compound.

C. In Liebig's combustion method, ordinary CuO is used.

D. Silver salt method is a chemical method for the determination of equivalent mass of organic acids.

Answer: A::B::D



Watch Video Solution

4. Which of the following statement is/are wrong?

A. Beilstein test is a reliable test for halogens in organic compounds.

B. In Lassaigne's test for N, Prussian blue colour is due to the formation of ferri ferri cyanide.

C. When $FeCl_3$ solution is added to the Lassaigne's extract, a blue solution is obtained which indicates the presence of both N and S.

D. Molecular mass of an acid = Equivalent
mass \times acidity

Answer: A::B::C::D



Watch Video Solution

5. Which of the following statements is/are correct?

A. When a lassaige's solution is heated with
dil. HNO_3 , cooled and $AgNO_3$ solution is

added, a yellow precipitate, partially soluble in NH_3 or NH_4OH indicates the presence of iodine is organic compound.

B. When $(CH_3COO)_4Pb$ solution is added to the acidified lassaigne's extract of an organic compound, a black precipitate of PbS is formed.

C. An organic compound containing N, on heating with conc. H_2SO_4 gives

$(NH_4)_2SO_4$ which liberates NH_3 of treatment with excess of $NaOH$.

D. The molecular mass of a non-volatile organic compound is determined either by dumas method or by Victor Meyer's method.

Answer: B::C



Watch Video Solution

6. Which of the following statements is/are wrong?

A. the gas displaced is Victor meyer's method is air.

B. The simplest formula that shows the ratio of the atoms of various elements present in the molecule is called the molecular formula.

C. Estimation of oxygen in an organic compound is also made by Aluise's

method

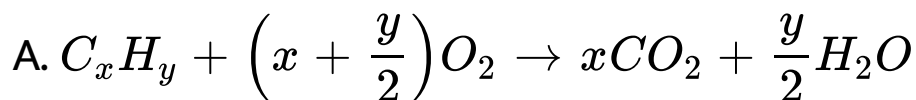
D. An organic monoacidic base B on reaction with H_2PtCl_6 forms an insoluble compound $B_2H_2PtCl_6$

Answer: B

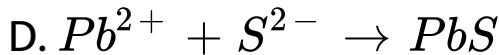
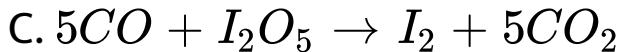
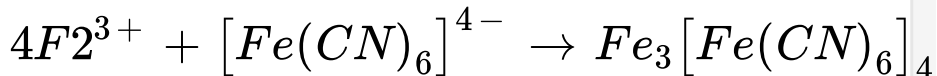


Watch Video Solution

7. Which of the following reaction is/are correct?



B.



Answer: C::D



Watch Video Solution

8. Which of the following statements is/are correct?

A. In Lassaigne's test for halogens, conc.

HNO_3 is used to remove HCN and H_2S

B. When an organic compound is heated

with dry CuO and the gases evolved are

passed through lime water which turns

milky, the gas may be CO_2 or SO_2 .

C. In Carius method, sulphur is oxidised to

SO_4^{2-} ion with fuming HNO_3

D. In Lassaigne's test, N present in the

organic compound is converted into

CN^{c-} ions.

Answer: A::B::C::D



Watch Video Solution

9. Which of the following statements is/are correct?

A. Molecular formula or molecular mass of a gaseous hydrocarbon can be determined

even without knowing their percentage composition by eudiometry.

B. In Lassaigne's test, N and S both present in the organic compounds are converted into CNS^- ion.

C. K_2SO_4 and $CuSO_4$ are added in Kjeldahl's method. K_2SO_4 acts as a catalyst while $CuSO_4$ raises the boiling point of H_2SO_4 .

D. Layer test is used to distinguish Cl^- and

Br^- ions.

Answer: A::B



Watch Video Solution

10. Which of the following statements is/are correct?

A. Nitroprusside ion is $[Fe(CN)_5NO]^{2-}$

B. Nitroprusside ion is $[Fe(CN)_5NOS]^{2-}$

C. Prussian blue and Turnbull's blue,

respectively, are $Fe_4[Fe(CN)_6]_3$ and

$Fe_3[Fe(CN)_6]_2$.

D. Prussian blue and Turnbulls's blue,

respectively, are $Fe_3[Fe(CN)_6]_2$ and

$Fe_4[Fe(CN)_6]_3$.

Answer: A::C



Watch Video Solution

Single Correct Answer Type

1. Forty millilitre of CO was mixed with 100 ml of O_2 and the mixture was exploded. On cooling, the reaction mixture was shaken with KOH What volume of gas is left?

A. 60 ml of O_2

B. 80 ml of O_2

C. 20 ml of CO

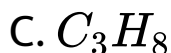
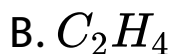
D. 40 ml CO_2

Answer: B



Watch Video Solution

2. Ten millilitre of a gaseous hydrocarbon was burnt completely in 80 ml of O_2 at STP. The volume of the remaining gas is 70 ml. The volume became 50 ml, on treatment with $NaOH$. The formula of the hydrocarbon is:



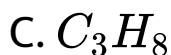
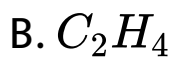
Answer: B



Watch Video Solution

3. 7.5 ml of a gaseous hydrocarbon was exploded with 36 ml of O_2 . On cooling the volume of gases was found to be 28.5 ml, 15 ml of which was absorbed by KOH and the rest was absorbed in a solution of alkaline pyrogallol. The formula of hydrocarbon is:

A. C_2H_6



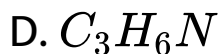
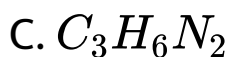
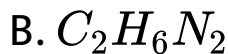
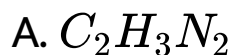
Answer: B



Watch Video Solution

4. Nine volumes of a gaseous mixture consisting of gaseous organic compound A and just sufficient amount of oxygen required for complete combustion yielded on burning four

volumes C_2 . Six volumes of water vapour, and two volumes of N_2 , all volumes measured at the same temperature and pressure. If the compound contains C , H and N only, the molecular formula of the compound A is :



Answer: B



Watch Video Solution

5. Two litre air formed 1915 ml of ozonised air when passed through Brodio's apparatus. The volume of ozone formed is:

A. 85 ml

B. 170 ml

C. 225 ml

D. 42.5 ml

Answer: B



Watch Video Solution

6. *n* – Butane (C_4H_{10}) is produced by monobromination of C_2H_6 followed by Wurtz reaction. Calculate the volume of ethane. The bromination takes place with 90% yield and the wurtz reaction with 85% yield.

A. 27.75 litres

B. 55.5 litres

C. 111 litres

D. 5.55 litres

Answer: B



Watch Video Solution

7. Six hundred millilitres of ozonised oxygen STP was found to weigh 1 gm. What is the volume of ozone in the ozonised oxygen?

A. 200 ml

B. 150 ml

C. 100 ml

D. 50 ml

Answer: A



Watch Video Solution

8. The weight of 1 litre of ozonised at STP was found to be 1.5 gm. When 100 ml of this mixture at STP was treated with turpentine oil the volume was reduced to 90 ml. The molecular weight of ozone is

A. 49

B. 47

C. 46

D. 47.9

Answer: C



Watch Video Solution

9. A mixture of ethylene and excess of H_2 has a pressure of 600 mm Hg. The mixture was passed over nickel catalyst to convert ethylene to ethane. The pressure of the resultant mixture at the similar condition of temperature and

volume dropped to 400 mm Hg. the fraction of C_2H_4 by volume dropped to 400 mm Hg. The fraction of C_2H_4 by volume in the original mixture is:

- A. 1/3rd of the total volume
- B. 1/4th of the total volume
- C. 2/3rd of the total volume
- D. 1/2 of the total volume

Answer: A



Watch Video Solution

10. In the estimation of nitrogen by Kjeldahl's method 2.8 gm of an organic compound required 20 millimole of H_2SO_4 for the complete neutralisation of NH_3 gas evolved.

The percentage of nitrogen in the sample is:

A. 20 %

B. 10 %

C. 40 %

D. 30 %

Answer: A



Watch Video Solution

11. 0.3 gm of platinumchloride of an organic diacidic base left 0.09 gm of platinum on ignition. The molecular weight of the organic base is:

A. 120

B. 240

C. 180

D. 60

Answer: B



Watch Video Solution

12. 0.5 gm of an organic substance containing phosphorous was heated with conc. HNO_3 in the carius tube. The phosphoric acid thus formed was precipitated with magnesia mixture ($MgNH_4PO_4$) which on ignition gave a residue of 1.0 gm of magnesium pyrophosphate ($Mg_2P_2O_7$). The percentage of phosphorous in the organic compound is:

A. 55.85 %

B. 29.72 %

C. 19.18 %

D. 20.5 %

Answer: A



Watch Video Solution

13. A compound has the molecular formula X_4O_6 . If 10g of X_4O_6 has 5.72g X , atomic mass of X is:

A. 32 amu

B. 37 amu

C. 42 amu

D. 98 amu

Answer: A



Watch Video Solution

14. An organic compound contains 4% sulphur.

Its minimum molecular weight is:

A. 200

B. 400

C. 800

D. 1600

Answer: C



Watch Video Solution

15. Lassaigne's test is used for the detection of:

A. *N*, *S*, halogens

B. C, H, and P

C. C, H, and O

D. C, S, and P

Answer: A



Watch Video Solution

16. In organic layer test CS_2 or Cl_4 is added to lassaig's extract and then Cl_2 water or $KMnO_4$ is added. This test is used to distinguish between

A. Br^{c-} and I^{c-}

B. Cl^{c-} and Br^{c-}

C. Cl^{c-} and I^{c-}

D. Cl^{c-} , Br^{c-} , and I^{c-}

Answer: A



Watch Video Solution

17. An organic compound containing sulphur is estimated by Carius method in which fuming HNO_3 is used to convert S into



Answer: B



Watch Video Solution

18. In Liebig's method for the estimation of C and H, if the compound also contains halogens,

which of the following is kept near the exit of the combustion tube?

A. silver wire $PbCeO_4$

B. both (a) and (c)

C. Cu gauge

D.

Answer: C



Watch Video Solution

19. In Liebig's method for the estimation of C and H, if the compound also contains both halogens and S, which of the following is kept near the exit of the combustion tube?

A. silver wire

B. $PbCrO_4$

C. Both (a) and (b)

D. Cu gauge

Answer: B



Watch Video Solution

20. In Liebig's method for the estimation of C and H , if the compound also contains N, which of the following is kept near the exist of the combustion tube?

A. silver wire

B. $PbCrO_4$

C. Both (a) and (b)

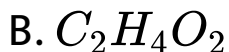
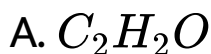
D. Cu gauge

Answer: D



Watch Video Solution

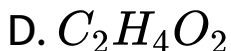
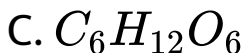
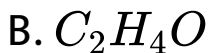
21. A compound (60 gm) on analysis gave $C = 24gm$ $H=4gm$ and $O=31gm$, its empirical formula is



Answer: C



22. A compound contains $C = 40\%$, $O = 53.5\%$, and $H = 6.5\%$ the empirical formula of the compound is:

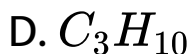
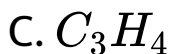
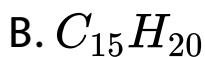
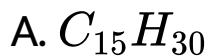


Answer: A



Watch Video Solution

23. A compound contains $C = 90\%$ and $H = 10\%$ Empirical formula of the compound is:

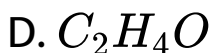
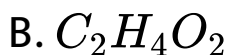
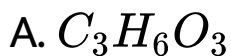


Answer: C



Watch Video Solution

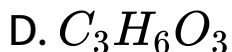
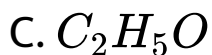
24. The empirical formula of a compound is CH_2O and its vapour density is 30. The molecular formula of the compound is:



Answer: B



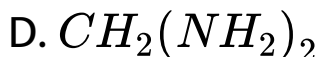
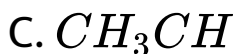
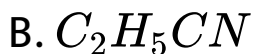
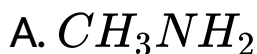
25. The molecular mass of a compound having empirical formula C_2H_5O is 90. The molecular formula of the compound is:



Answer: B



26. A compound contains 38.8 % *C*, 16 % *H*, and 45.2 % *N* The formula of the compound would be

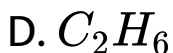
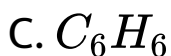
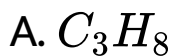


Answer: A



Watch Video Solution

27. A compound containing 80 % C and 20 % H is likely to be:

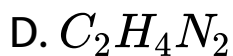
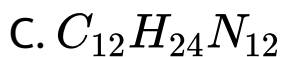
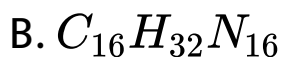
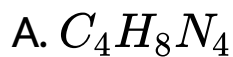


Answer: D



Watch Video Solution

28. An organic compound on analysis gave $C = 42.8\%$, $H = 7.20\%$, and $N = 50\%$ by volume. A volume of 1 gm of the compound was found to be 200 ml at STP. Molecular formula of the compound is:



Answer: A





Watch Video Solution

29. 0.14 gm of an acid required 12.5 ml of 0.1 N $NaOH$ for complete neutralisation. The equivalent mass of the acid is:

A. 63

B. 56

C. 45

D. 112

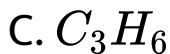
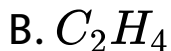
Answer: D





Watch Video Solution

30. The empirical formula of an inorganic compound is CH_2 . The mass of 1 mol of it is 42 gm. The molecular formula of the compound is:



Answer: C





Watch Video Solution

31. Insulin contains 3.4% sulphur. The minimum molecular mass of insulin is:

A. 940

B. 350

C. 470

D. 560

Answer: A



Watch Video Solution

32. 0.24 gm of a volatile liquid upon vaporisation given 45 ml of vapours at STP. What will be the vapour density of the substance? (density of $H_2 = 0.089 \text{ gmlitre}^{-1}$)

A. 9.539

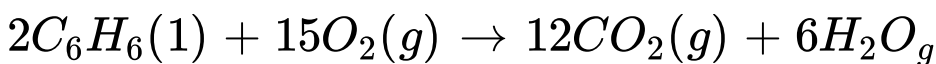
B. 59.93

C. 5.993

D. 95.39

Answer: B

33. Liquid benzene (C_6H_6) burns in oxygen according to



How many litres of O_2 at STP are needed for complete combustion of 39 gm of liquid benzene?

A. 11.2 litres

B. 74 litres

C. 84 litres

D. 22.4 litres

Answer: C



Watch Video Solution

34. A compound which does not give a positive test in Lassaigne's test for nitrogen is:

A. Glycine

B. Hydrazine

C. Urea

D. Phynyle hydrazine

Answer: B



Watch Video Solution

35. The catalyst used in Kjeldahl's method for the entimation of nitrogen is:

A. Copper

B. Magnesium

C. Mercury

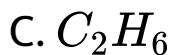
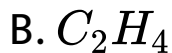
D. Sodium

Answer: C



Watch Video Solution

36. The concentration of $C = 85.45\%$ and $H = 14.55\%$ is not obeyed by the formula:



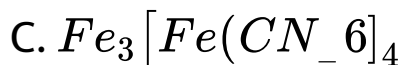
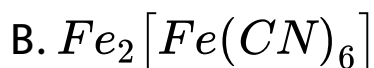
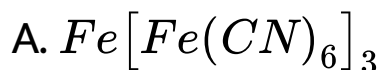
D. CH_2

Answer: C



Watch Video Solution

37. The Prussian blue colour obtained during the test of nitrogen by Lassaigne's test is due to the formation of:





Answer: A



Watch Video Solution

38. Which of the following sodium compound is/are formed when an organic compound containing both nitrogen and sulphur is fused with sodium?

A. Suphite and cyanide

B. Thiocyanate

C. Cyanide and sulphide

D. nitrate and sulphide

Answer: B

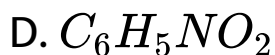
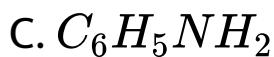


Watch Video Solution

39. In which of the following compounds, nitrogen cannot be tested by Lassaigne's test?

A. CH_3CONH_2

B. $NH_2 \cdot NH_2H_2O$



Answer: B



Watch Video Solution

40. In dumas method for the estimation of nitrogen in an organic compound, nitrogen is determined in the form of:

A. Gaseous nitrogen

B. Sodium cyanide

C. Ammonium sulphate

D. Gaseous ammonia

Answer: A



Watch Video Solution

Assertion Reasoning Type

1. (a). If both (A) and (R) are correct and (R) is the correct explanation for (A).

(b). If both (A) and (R) are correct and (R) is the

correct explanation for (A).

(c). If (A) is correct and (R) is incorrect.

(d). If (A) is incorrect and (R) is correct. Itbr. (e). If both (A) and (R) are incorrect.

Q. Assertion (A): Essential oils are volatile and are insoluble in H_2O

Reason (R): Essential oils are purified by steam distillation.



[View Text Solution](#)

2. (a). If both (A) and (R) are correct and (R) is the correct explanation for (A).

(b). If both (A) and (R) are correct and (R) is the correct explanation for (A).

(c). If (A) is correct and (R) is incorrect.

(d). If (A) is incorrect and (R) is correct. Itbr. (e). If both (A) and (R) are incorrect.

Q. Assertion (A): Hydroxylamine (NH_2OH) contains N, and hence gives prussian blue colour in lassaigne's test.

Reason (R): Hydroxylamine does not contain C, so with Na metal. CN^{c-} ion is not formed.



[Watch Video Solution](#)

3. (a). If both (A) and (R) are correct and (R) is the correct explanation for (A).

(b). If both (A) and (R) are correct and (R) is the correct explanation for (A).

(c). If (A) is correct and (R) is incorrect.

(d). If (A) is incorrect and (R) is correct. Itbr. (e). If both (A) and (R) are incorrect.

Q. Assertion (A): Benzene (boiling point 353K) and methanol (boiling point 338K) are separated by simple distillation.

Reason (R): Fractional distillation is used to

separate two liquids from their mixture when their boiling points differ by 20° or so.



Watch Video Solution

4. (a). If both (A) and (R) are correct and (R) is the correct explanation for (A).

(b). If both (A) and (R) are correct and (R) is the correct explanation for (A).

(c). If (A) is correct and (R) is incorrect.

(d). If (A) is incorrect and (R) is correct. (e). If both (A) and (R) are incorrect.

Q. Assertion (A): Dumas method is more

applicable to nitrogen containing organic compounds than Kjeldahl's method.

Reason (R): Kjeldahl's method does not give satisfactory results for compounds in which N is linked to O atom.



[View Text Solution](#)

5. (a). If both (A) and (R) are correct and (R) is the correct explanation for (A).

(b). If both (A) and (R) are correct and (R) is the correct explanation for (A).

(c). If (A) is correct and (R) is incorrect.

(d). If (A) is incorrect and (R) is correct. Itbr. (e). If both (A) and (R) are incorrect.

Q. Assertion (A): In organic layer test, Cl_2 water is added to the sodium extract, which oxidises Br^{c-} and I^{c-} ions to Br_2 and I_2 , respectively.

Reason (R): Reduction potential of Cl_2 is greater than that of Br_2 and I_2 .



[View Text Solution](#)