doubtnut
India's Number 1 Education App

CHEMISTRY

JEE (MAIN AND ADVANCED)

CHEMISTRY

ALIPHATIC HYDROCARBONS

Problem

1. Predict the major product formed when 2 - methyl-3-pentanol is dehydrated with alumina.

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2. Write the structures of major and minor products when 2-bromo-3-methylbutane is heated with potassium hydroxide in ethanol.

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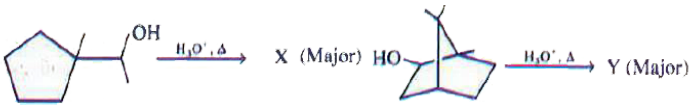
3. What are X and Y in the following reactions ?



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4. Give the equation for the formation of main product when hydrogen iodide is added to isobutylene.

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5. Write IUPAC names of the products obtained by addition reactions of HBr to but-l-ene:

(i) in the absence of peroxide and

(ii) in the presence of peroxide.

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6. Why peroxide effect is not applicable to HCl and HI?

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7. Give the IUPAC name of the product formed when isobutylene is treated with a few drops

of concentrated sulphuric acid.

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8. Predict the product formed when cyclo-hexene is treated with N-bromosuccininide.

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9. Write the reaction products of 2-pentene when oxidised with acidified potassium permanganate at $100^{\circ} C$.

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10. Ethene on treating with bromine in presence of sodium chloride forms a mixture of CH_2ClCH_2Br and CH_2BrCH_2Br. Give reason.

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11. Write the structure of all the isomers of dichloroethene. Which one of them will have

zero dipole-moment?

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12. Give the equation for the ozonolysis products of 2,3-dimethyl-2-pentene.

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13. A hydrocarbon, C_4H_8, neither decolourised bromine in carbontetrachloride nor reacted with hydrogen bromide. When heated to

$200^{\circ}C$ with hydrogen in presence of nickel catalyst, a new hydrocarbon, C_4H_{10} was formed. What was the orginal hydrocarbon?

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14. The reductive ozonolysis of an alkene gave butanone and ethanal. Give the structure of alkene and its IUPAC name.

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15. Isoprene is a diene. How are the positions of double bonds located?

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16. Write the structures of different isomers corresponding to the 5^{th} member of alkyne series. Write their IUPAC names.

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17. Give the equation for the formation of the final stable product when propyne adds on hypochlorous acid. Explain.

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18. How does water add on to propyne? Give the equations and explain.

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19. The ozonolysis product of an alkyne is 2-oxopentanal. Then the alkyne is_____

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20. Explain the formation of ozonolysis products of 2-butyne.

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21. Based on reductive ozonolysis reaction, how do you distinguish between an alkene and alkyne?

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22. Can propene and propyne be distinguished by using Baeyer's reagent? If not, what is the suitable reagent?

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23. Acetylene is acidic but it does not react with sodium hydroxide or potassium hydroxide. Give reason.

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24. How do you distinguish between 1-butyne and 2-butyne?

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25. Compare the acidic strengths of ethyne, propyne and 2-butyne.

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26. How is acetylene converted to 3-hexyne ?

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Exercise 4 1 1

1. How ethylene is obtained from ethyl alcohol? Write the reaction.

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2. Mention the reagents used in the preparation of alkenes by dehydration, dehydro- halogenation and dehalogenation.

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3. How ethylene can be obtained from acetylene?

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4. Which salt is to be electrolysed to get ethylene? Mention the names of the products formed at anode and cathode.

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5. Write the preparation of ethylene by elimination methods. Write the relevant equations.

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6. Discuss the addition properties of ethylene with suitable examples.

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7. How is ethylene oxidised ?

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8. Discuss about the test for unsaturation of alkenes.

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9. What is ozonolysis? Write equation for the ozonolysis of ethylene. Draw the structure of

the ozonide.

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10. Write on the polymerisation of ethylene.

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11. Write the important uses of ethylene.

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Exercise 4 1 2

1. Give the methods of preparation of acetylene.

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2. What are the oxidation products of acetylene? Give equations.

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3. The final product formed when acetylene gas is passed through dilute sulphuric acid in presence of heavy metal cation at $60 - 65^{\circ} C$ is

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4. Describe the Kolbe's electrolytic method for the preparation of acetylene.

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5. What happens when water is added to calcium carbide?

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6. How do you convert ethyne to ethanal, oxalic acid and benzene ?

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7. Discuss the addition properties of ethylene with suitable examples.

8. Write any two reactions of acetylene which explain the acidic character of acetylene.

9. Write the ozonolysis product of acetylene. Write chemical equation.

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10. How does acetylene react with hydrogen cyanide, acetic acid and hypochlorous acid ?

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11. What is the cycle polymerisation product of acetylene.

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12. Discuss the addition of HBr with acetylene is absence of acid in presence of peroxide.

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13. Write any two uses of acetylene.

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Questions For Descriptive Answers

1. $C_2H_5Cl \xrightarrow[KOH]{Alc} A \xrightarrow[CCl_4]{Br_2} B$. What are the compounds 'A' and 'B'. Write their names ?

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2. Among aliphatic hydrocarbons, why alkanes are less reactive?

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3. Propene reacts with HBr to give isopropyl bromide but not n-propyl bromide. Why?

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4. A gaseous mixture contains ethylene and acetylene. How are they separated ?

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5. How is unsaturation in organic compounds tested ?

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6. A gaseous mixture contains ethane and ethylene. How are the individual members recovered?

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7. Propanal and propanone are the ozonolysis products of an alkene. Wžite the IUPAC name of that alkene formed.

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8. Name the product of addition of sulphur monochloride to ethylene? What is its use?

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9. Various products formed when ethylene reacts with concentrated sulphuric acid at different temperatures substantiate.

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10. Give the equation for the reaction between 1-butene and chlorine water.

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11. Acetylene gives a compound 'X' when treated with water in the presence of Hg^{2+}. 'X' undergoes rearrangement and gives the product 'Y'. Write the names of the compounds 'X' and 'Y'.

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12. Write IUPAC names of the products obtained by the ozonolysis of the following compounds :

(i) Pent-2-ene ,(ii) 3,4-Dimethylhept-3-ene ,(iii) 2-Ethylbut-1-ene ,(iv) 1-Phenylbut-1-ene

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13. Only propanone is formed during the ozonolysis of an alkene ? Give its structure.

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14. Write the major and minor products formed when 1-butene adds on HBr in absence

of peroxide.

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15. Give the structural formula of the product formed when n-propyl alcohol reacts with PCl_3 and alcoholic potash.

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16. Write the IUPAC names of the products obtained by the ozonolysis of the following :

(i) 3,4-Dimethylhept-3-ene, (ii) 2-Ethyl but-1-ene and (iii) 1-Phenylbut-1-ene and

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17. Which of the following would exhibit geometrical isomerism ? Hex-2-ene, 2-methylpent-1-ene, 2-methylpropene and 4-methylpent-2-ene

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18. An alkene 'A' contains three C-C, eight C-H bonds and one C=C bond. 'A' on ozonolysis gives two moles of an aldehyde of molar mass 44. Write the IUPAC name of 'A'.

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19. Among ethylene and acetylene, which is more reactive towards electrophilic addition reactions? Why?

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20. Differentiate between linear polymerisation and cyclic polymerisation of acetylene.

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21. Acetylene is acidic. Substantiate.

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22. How do you prepare 1-butyne starting from actylene, ?

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23. Compare the acidic nature of ethane, ethene and ethyne.

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24. How do you distinguish between 1-butyne and 2-butyne?

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