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UDUPI

CET25C6 HALOALKANES AND HALOARENES

Class 12 - Chemistry

Time Allowed: 1 hour and 30 minutes **Maximum Marks: 70**

1. To prepare alkanes containing odd number of carbon atoms, Wurtz reaction is not preferred because: **[1]**

   a) a lot of reaction mixture goes wasted.

   b) a mixture of three different alkyl halides has to be used.

   c) a mixture of four different alkyl halides has to be used.

   d) a mixture of two different alkyl halides has to be used.

2. A dibromo derivative of an alkane reacts with sodium metal to form an alicyclic hydrocarbon. The derivative is **[1]**

   a) 1, 1 – dibromopropane

   b) 2, 2 – dibromobutane

   c) 1, 2 – dibromoethane

   d) 1, 4 – dibromobutane

3. Decreasing order of reactivity of hydrogen halide acids in the conversion of ROH $\rightarrow$ RX is: **[1]**

   a) HF > HBr > HI > HCI

   b) HI > HBr > HCl > HF

   c) HF > HCI> HBr > HI

   d) HCI > HBr > HI > HF

4. When a haloalkane with β – hydrogen atom is heated with alcoholic solution of potassium hydroxide then: **[1]**

   a) All of these

   b) elimination of halogen atom from α – carbon

   c) elimination of hydrogen atom from β– carbon

   d) alkene is formed as a product

5. The preparation of alkyl chloride is carried out by: **[1]**

   a) constant boiling of alcohol with HCl.

   b) passing dry hydrogen chloride gas through a solution of alcohol.

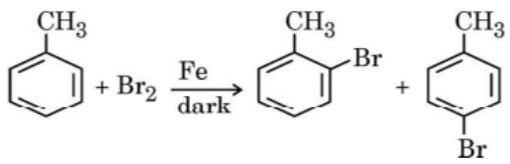
   c) heating alcohol with potassium chloride.

   d) heating alcohol with sodium chloride.

6. Which of the following reactions is a halogenated exchange reaction: **[1]**

   a) $R - OH + HCl \xrightarrow{ZnCl_2} R - Cl + H_2O$

   b) $>C=C< + HX \longrightarrow >\underset{H}{\underset{|}{C}}-\underset{X}{\underset{|}{C}}<$

   c) 

   d) $R - X + NaI \xrightarrow{Dry\ acetone} R - I + NaX$

7. Which one of the following is a synthetic halogen compound? **[1]**

   a) Chloramphenicol

   b) Diphenyl hydramine

   c) Chloroquine

   d) Omeprazole

8. Isomers of the compound C_4H_9Br are: **[1]**

a) 1-Bromo-2-methylbutane and 2-Bromo-2-methylbutane

b) 1 – Bromobutane and 2 – Bromobutane

c) 1 – Bromobutane, 2 – Bromobutane, 1 – bromo- 2 – methylpropane, and 2 – bromo-2 – methylpropane

d) 1 – Bromo - 2 – methylpropane and 2 – Bromo - 2 – methylpropane

9. IUPAC name of neo-Pentylbromide is: **[1]**

a) 1-Bromo-3-methylbutane

b) 1-Bromo-2,2-dimethylpropane.

c) 1-Bromo-1,2-dimethylpropane

d) 1-Bromo-2-methylbutane

10. Hydrocarbons having double the number of carbon atoms than present in the original alkyl halide are produced by using: **[1]**

a) Sandmeyer' reaction

b) Williamson's synthesis

c) Fittig reaction

d) Wurtz reaction

11. IUPAC name of $(CH_3)_3CCl$ is: **[1]**

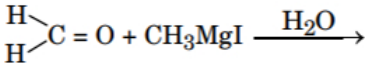
a) n – butyl chloride

b) 3 – chloro butane

c) t – butyl chloride

d) 2-chloro, 2-methyl propane

12. What would be the major product of the given reaction? **[1]**



a) Ethanol

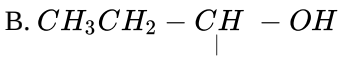
b) Ethanal

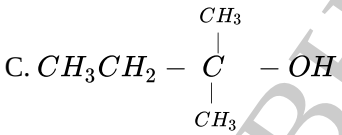
c) Propanol

d) Propanal

13. The order of reactivity of following alcohols with halogen acids is _____. **[1]**

A. CH_3CH_2 —CH_2—OH

B. 

C. 

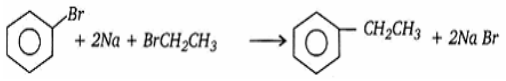
a) (A) > (C) > (B)

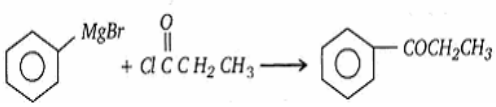
b) (C) > (B) > (A)

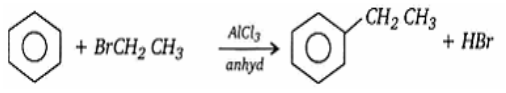
c) (B) > (A) > (C)

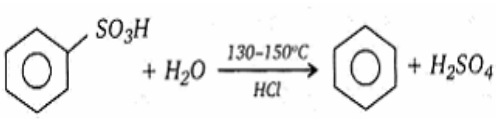
d) (A) > (B) > (C)

14. Which of the following is a Wurtz-Fitting reaction? **[1]**

a) 

b) 

c) 

d) 

15. Benzylic halides contains: **[1]**

a) sp^3-hybridized carbon atom, next to an

b) sp^2-hybridized carbon atom next to an

aromatic ring bonded to a halogen.

aromatic ring.

c) sp^3-hybridized carbon atom next to carbon-carbon double bond.

d) a halogen atom bonded to an alkyl group.

16. Toluene reacts with a halogen in the presence of iron (III) chloride giving ortho and para halo compounds. The reaction is **[1]**

a) Nucleophilic substitution reaction

b) Free radical addition reaction

c) Electrophilic elimination reaction

d) Electrophilic substitution reaction

17. Decomposition of benzene diozonium chloride by using Cu_2Cl_2/HCl to form chlorobenzene is: **[1]**

a) Wurtz – Fittig reaction

b) Friedel – Crafts reaction

c) Sandmeyer's reaction

d) Finkelstein reaction

18. Which of the following compounds has the highest boiling points? **[1]**

a) $CH_3CH_2CH_2Cl$

b) $CH_3CH_2CH_2CH_2Cl$

c) $(CH_3)_3Cl$

d) $CH_3CH(CH_3)CH_2Cl$

19. Which one of the following forms propane nitrile as the major product? **[1]**

a) Propyl bromide + alcoholic KCN

b) Ethyl bromide + alcoholic KCN

c) Propyl bromide + alcoholic AgCN

d) Ethyl bromide + alcoholic AgCN

20. Which reagent will you use for the following reaction? **[1]**

$CH_3CH_2CH_2CH_3 \rightarrow CH_3CH_2CH_2CH_2Cl + CH_3CH_2CHClCH_3$

a) Cl_2 gas in the presence of iron in dark

b) $NaCl + H_2SO_4$

c) Cl_2 gas in dark

d) Cl_2/UV light

21. Vinylic halides contain: **[1]**

a) a sp^3-hybridized carbon atom, next to an aromatic ring, to which halogen atom is bonded.

b) a halogen atom bonded to an sp^2-hybridized carbon atom of a carbon-carbon double bond.

c) a halogen atom bonded to an sp^3-hybridized carbon atom next to carbon-carbon double bond.

d) a sp^2-hybridized carbon atom of an aromatic ring which is bonded to a halogen.

22. A halogen used in potential blood substitutes in surgery is: **[1]**

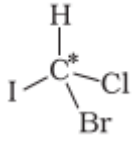
a) Fluorine

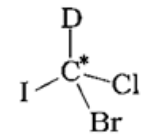
b) Bromine

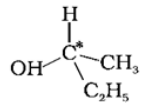
c) Iodine

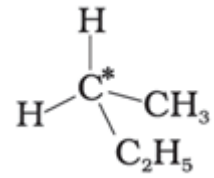
d) Chlorine

23. In which of the following molecules carbon atom marked with an asterisk (*) is asymmetric? **[1]**

a. 

b. 

c. 

d. 

a) (b), (c), (d)

b) (a), (b), (c)

c) (a), (b), (c), (d)

d) (a), (c), (d)

24. The synthesis of alkyl fluoride is best obtained from: **[1]**

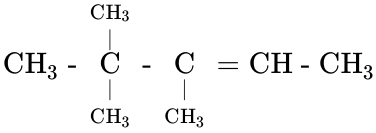
a) Finkelstein reaction

b) Swartz reaction

c) Free radicals

d) Sandmeyer reaction

25. Name the following compound as per the IUPAC system **[1]**



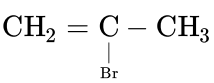
a) 3, 4, 4 - trimethylpent - 2 - ene

b) 2 diethyl, 3 - ethyl pentene

c) 4 diethyl, 2 - ethyl pentene

d) 2, 2, 3 - trimethylpent - 4 - ene

26. Which of the following belongs to the class of Vinyl halides? **[1]**

a) 

b) $CH \equiv C - Br$

c) $CH_2 = CHCH_2CH_2Cl$

d) $CH_2 = CH - CH_2 - Br$

27. Racemisation occurs in **[1]**

a) S_N2 reaction

b) S_N2 reaction as well as S_N1 reaction

c) Neither S_N1 nor S_N2 reactions

d) S_N1 reaction

28. Which one of the following compounds is more reactive towards S_N1 reaction? **[1]**

a) $C_6H_5CH(C_6H_5)Br$

b) $CH_2 = CHCH_2Br$

c) $C_6H_5CH(CH_3)Br$

d) $C_6H_5CH_2Br$

29. The conversion of an alkyl halide into an alcohol by aqueous NaOH is classified as **[1]**

a) a dehydrohalogenation reaction

b) a substitution reaction

c) an addition reaction

d) a dehydration reaction

30. Which one of the following is employed as antityphoid drug? **[1]**

a) Diphenyl hydramine

b) Chloramphenicol

c) Omeprazole

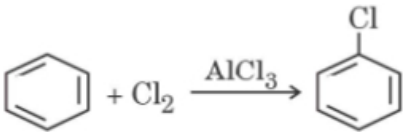
d) Chloroquine

31. Maximum number of molecules of CH_3I that can react with a molecule of CH_3NH_2 is: **[1]**

a) 2 b) 4

c) 1 d) 3

32. The species that attacks benzene in following is: **[1]**



a) Cl^+ b) $AlCl_3$

c) Cl^- d) $AlCl_4^-$

33. Which of the following belongs to the class of alkyl halides? **[1]**

a) $CH \equiv C - CH_2 - Cl$ b) $CH_2 = CH - Cl$

c) $CH_2 = CH - CH_2 - CH_2 - Cl$ d) $CH_2 = \underset{Cl}{CH} - CH_3$

34. Chloromethane on treatment with excess of ammonia yields mainly **[1]**

a) Methanamine (CH_3NH_2) b) Mixture containing all these in equal proportion

c) N–methylmethanamine (CH_3—NH—CH_3) d) N, N-Dimethylmethanamine ($CH_3—N(CH_3)_2$)

35. The synthesis of 3 – octyne is achieved by adding a bromoalkane into a mixture of sodium amide and an alkyne. The bromoalkane and alkyne respectively are **[1]**

a) $BrCH_2CH_2CH_3$ and $CH_3CH_2CH_2C \equiv CH$ b) $BrCH_2CH_2CH_2CH_3$ and $CH_3C \equiv CH$

c) $BrCH_2CH_2CH_2CH_2CH_3$ and $CH_3CH_2C \equiv CH$ d) $BrCH_2CH_2CH_2CH_3$ and $CH_3CH_2C \equiv CH$

36. Retention of configuration is observed in **[1]**

a) S_N1 reaction b) Neither S_N1 nor S_N2 reaction

c) S_N2 reaction d) S_N2 reaction as well as S_N1 reaction

37. Which of the following alcohols will yield the corresponding alkyl chloride on reaction with concentrated HCl at room temperature? **[1]**

a) CH_3CH_2—CH_2—OH b) $CH_3CH_2 - \underset{CH_3}{\overset{CH_3}{C}} - OH$

c) $CH_3CH_2 - \underset{CH_3}{C} - OH$ d) $CH_3CH_2 - \underset{CH_3}{C} - CH_2OH$

38. Which is the correct IUPAC name for $CH_3 - \underset{C_2H_5}{CH} - CH_2 - Br$? **[1]**

a) 1-Bromo-2-ethyl-2-methylethane b) 1-Bromo-2-methylbutane

c) 2-Methyl-1-bromobutane

d) 1-Bromo-2-ethylpropane

39. Which of the following has highest boiling point? **[1]**

a) C_2H_5-I

b) C_2H_5-F

c) C_2H_5-Cl

d) C_2H_5-Br

40. Which of the following alkyl halides will undergo S_N1 reaction most readily? **[1]**

a) $(CH_3)_3C—I$

b) $(CH_3)_3C—F$

c) $(CH_3)_3C—Br$

d) $(CH_3)_3C—Cl$

41. The conversion of an alkyl halide into an alkene by alcoholic KOH is classified as **[1]**

a) a substitution reaction

b) a dehydration reaction

c) a dehydrohalogenation reaction

d) an addition reaction

42. A hydrocarbon C_5H_{10} does not react with chlorine in dark but gives a single monochloro compound C_5H_9Cl in bright sunlight. The hydrocarbon is **[1]**

a) Cyclopentene

b) Cyclosporine

c) Cycloalkyne

d) Cyclopentane

43. C - Cl bond in chlorobenzene in comparison to C - Cl bond in methyl chloride is: **[1]**

a) longer and stronger

b) shorter and weaker

c) longer and weaker

d) shorter and stronger

44. Which of the following molecules has a chiral centre correctly labelled with an asterisk (*)? **[1]**

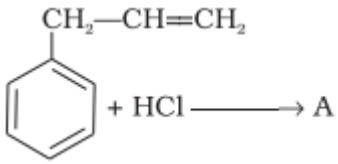
a) $HOCH_2C^*H(OH)CH_2OH$

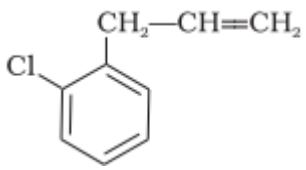
b) $CH_3C^*HClCH_2Br$

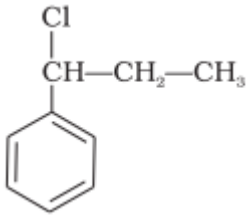
c) $CH_3C^*HBrCH_3$

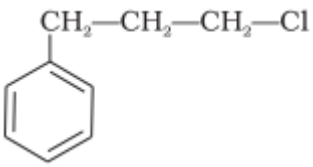
d) $CH_3C^*Br_2CH_3$

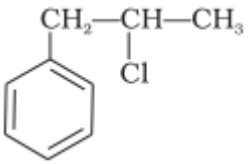
45. What is **A** in the following reaction? **[1]**



a) 

b) 

c) 

d) 

46. Chloroform is stored in closed dark coloured bottles completely filled because it: **[1]**

a) gets slowly oxidized by air in the presence of light and form a poisonous gas.

b) forms an extremely poisonous gas in the presence of light.

c) can change its colour in the presence of light and get spoilt by the action of light.

d) gets slowly oxidized by air in the presence of light.

47. The iodine-containing hormone produced by our body is: **[1]**

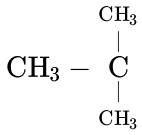
a) Progesterone

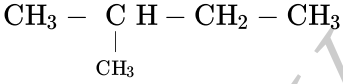
b) Insulin

c) Thyroxine

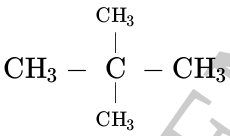
d) Adrenaline

48. Which of the following isomer of pentane (C_5H_{12}) will give three isomeric monochlorides on photochemical chlorination? **[1]**

a) 

b) 

c) $CH_3CH_2CH_2CH_2CH_3$

d) 

49. Inversion of configuration occurs in **[1]**

a) S_N1 as well as S_N2 reaction

b) S_N1 reaction

c) Neither S_N2 nor S_N1 reaction

d) S_N2 reaction

50. A hydrocarbon C_5H_{10} does not react with chlorine in dark but gives a single monochloro compound C_5H_9Cl in bright sunlight. The hydrocarbon is: **[1]**

a) Cyclopentene

b) Cyclopentyne

c) Pentane

d) Cyclopentane

51. Ethylidene chloride is a/an _____. **[1]**

a) vic-dihalide

b) vinylic halide

c) gem-dihalide

d) allylic halide

52. Carbon tetrachloride has a dipole moment: **[1]**

a) μ = 0

b) μ = 1

c) μ = 2

d) μ = 4

53. The best method for the conversion of an alcohol into an alkyl chloride is by treating the alcohol with: **[1]**

a) $SOCl_2$ in presence of pyridine

b) PCl_3

c) Dry HCl in the presence of anhydrous $ZnCl_2$

d) PCl_5

54. In alkyl halide: **[1]**

a) All of these

b) the carbon atom of C-halogen bond bears a partial positive charge

c) the halogen atom bears a partial negative charge

d) the carbon-halogen bond of alkyl halide is polarized

55. Methyl bromide is converted into ethane by heating it in ether medium with: **[1]**

a) Na

b) Cu

c) Al

d) Zn

56. Which is the correct increasing order of boiling points of the following compounds? **[1]**

1-Iodobutane, 1-Bromobutane, 1-Chlorobutane, Butane

a) Butane < 1-Iodobutane < 1-Bromobutane < 1-Chlorobutane

b) Butane < 1-Chlorobutane < 1-Iodobutane < 1-Bromobutane

c) Butane < 1-Chlorobutane < 1-Bromobutane < 1-Iodobutane

d) 1-Iodobutane < 1-Bromobutane < 1-Chlorobutane < Butane

57. Which branched chain isomer of the hydrocarbon with molecular mass 72u gives only one isomer of monosubstituted alkyl halide? **[1]**

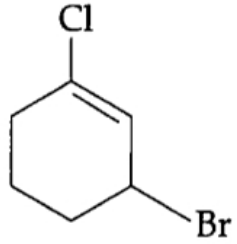
a) Tertiary butyl chloride

b) Neohexane

c) Isohexane

d) Neopentane

58. The IUPAC name of the compound shown below is: **[1]**



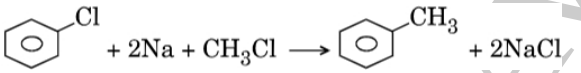
a) 6-bromo-2-chlorocyclohexene

b) 3-bromo-1-chlorocyclohexene

c) 2-bromo-6-chlorocyclohex-1-ene

d) 1-bromo-3-chlorocyclohexene

59. The reaction given below: **[1]**



is called:

a) Gattermann reaction

b) Wurtz - Fittig reaction

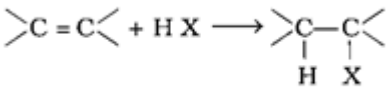
c) Wurtz reaction

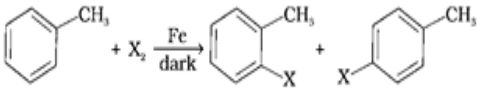
d) Fittig reaction

60. Which of the following is halogen exchange reaction? **[1]**

a) R X + NaI $\rightarrow$ RI + NaX

b) $R-OH+HX \xrightarrow{ZnCl_2} R-X+H_2O$

c) 

d) 

61. Which of the following compounds will give racemic mixture on nucleophilic substitution by OH^- ion? **[1]**

a. $CH_3-\underset{\underset{C_2H_5}{|}}{\overset{\overset{Br}{|}}{CH}}-Br$

b. $CH_3-\underset{\underset{C_2H_5}{|}}{CH}-CBr$

c. $CH_3-\underset{\underset{C_2H_5}{|}}{CH}-CH_2Br$

a) (b), (c)

b) (a), (c)

c) (a), (b), (c)

d) (a)

62. The correct IUPAC name of $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{OH}{|}}{C}} - CH_2CH_3$ is **[1]**

a) 3-Methylbutan-3-ol

b) tert-butyl alcohol

c) 2-Methylbutan-2-ol

d) 2,2-Dimethylpropanol

63. Molecules whose mirror image is non-superimposable over them are known as chiral. Which of the following molecules is chiral in nature? **[1]**

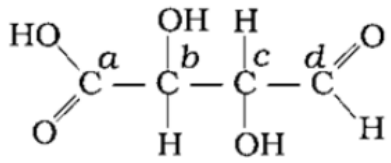
a) 2-Bromopropan-2-ol

b) 2-Bromopropane

c) 2-Bromobutane

d) 1-Bromobutane

64. Which of the carbon atoms present in the molecule given below are asymmetric? **[1]**



a) a, d

b) a, b, c, d

c) a, b, c

d) b, c

65. Which of the following undergoes nucleophilic substitution exclusively by S_N1 mechanism? **[1]**

a) Isopropyl chloride

b) Chlorobenzene

c) Ethyl chloride

d) Benzyl chloride

66. Chlorine reacts with cold and dilute NaOH to give **[1]**

a) NaClO and $NaClO_3$

b) NaCl and $NaClO_3$

c) NaCl and NaClO

d) NaCl and $NaClO_4$

67. Chlorobenzene is formed by the reaction of chlorine with benzene in the presence of $AlCl_3$. Which of the following species attacks the benzene ring in this reaction? **[1]**

a) $AlCl_3$

b) $[AlCl_4]^-$

c) Cl^+

d) Cl^-

68. Which of the following has the highest melting point? **[1]**

a) All have the same melting point

b) p-Dichlorobenzene

c) m-Dichlorobenzene

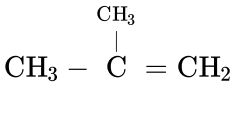
d) o-Dichlorobenzene

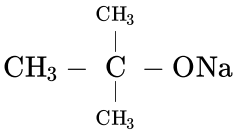
69. Major product formed in the following reaction **[1]**

$$CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - Br + NaOCH_3 \rightarrow$$

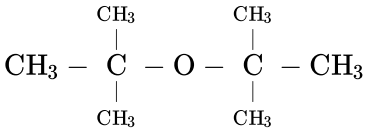
a)

b)

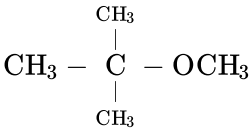




c)



d)



70. The reaction of ammonia with a large excess of methyl chloride will yield mainly: **[1]**

a) methylamine

b) trimethylamine

c) tetramethylammonium chloride

d) dimethylamine