

Important Questions Class XII Chemistry (2009) Set - III

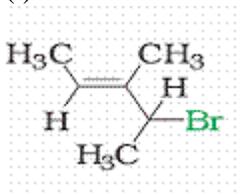
Chemistry

Q. 1. Among the isomeric alkanes of molecular formula C_5H_{12} , identify the one that on photochemical chlorination yields (i) A single monochloride (ii) Three isomeric monochlorides. (1 mark)

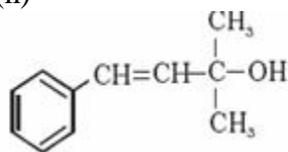
Q. 2. While separating a mixture of ortho and Para nitrophenols by steam distillation, name the isomer which will be steam volatile. Give reason. (1 mark)

Q. 3. Write the IUPAC name of the following. (2 mark)

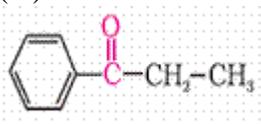
(i)



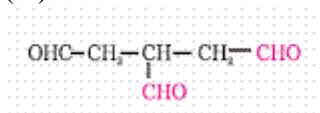
(ii)



(iii)



(iv)



Q. 4. With the help of an example discuss the stereo chemistry involved in S_N1 and S_N2 mechanism. (2 marks)

Q. 5. Explain Saytzeff rule by taking suitable examples. (2 marks)

Q. 6. Draw the structures of all isomeric alcohols of molecular formula $C_5H_{12}O$ and give their IUPAC names. Classify these isomers of alcohols as primary, secondary and tertiary alcohols. (2 marks)

Q. 7. Nitro group increases the reactivity of chlorobenzene when attached to o and p- position but not at meta position? Explain? Write the mechanism also. (3 marks)

Q. 8. Account for the following. (3 marks)

- It is necessary to avoid even traces of moisture from a Grignard reagent.
- Chloroform is stored in closed dark colored bottles completely filled.
- The carbon-oxygen bond length in phenol is slightly less than that in methanol.

Q. 9. (a) Explain the fact that in aryl alkyl ethers (i) the alkoxy group activates the benzene ring towards electrophonic substitution and (ii) it directs the incoming substituents to ortho and Para positions in benzene ring. (2 mark)

(b) Arrange the following compounds in increasing order of their acid strength: (1 mark)
Propan-1-ol, 2,4,6-trinitrophenol, 3-nitrophenol, 3,5-dinitrophenol, phenol, 4-methylphenol

Q. 10. Give equations of the following reactions: (3 mark)

- Preparation of Sec-Butyl alcohol from ethanal
- Preparation of Phenol from Aniline.
- Treating phenol with chloroform in presence of aqueous NaOH.

Q. 11. How will you distinguish between the following: (3 marks)

- Propanoic acid and propanal
- Ethanal and Benzaldehyde
- Pentan-3-one and Pentan-2-one

Q. 12. How will you bring about the following conversions in not more than two steps. (5 marks)

- Propanone to Propene
- Benzene to m-Nitroacetophenone
- Chlorobenzene to benzoic acid
- Propanoic acid to propene
- Propyne to propan-2-ol

Q. 13. Explain the following with the help of suitable examples: (5 marks)

(a) Limitation of Williamson's synthesis (b) Stephen reaction. (c) Hell-Volhard-Zelinsky reaction (d) Aldol Condensation (e) Wolff-Kishner reduction.

Q. 14. (a) An organic compound (A) (molecular formula $C_8H_{16}O_2$) was hydrolysed with dilute sulphuric acid to give a carboxylic acid (B) and an alcohol (C). Oxidation of (C) with chromic acid produced (B). (C) on dehydration gives but-1-ene. Write equations for the reactions involved

(b) Predict the products formed when cyclohexanecarbaldehyde reacts with following reagents.

- $PhMgBr$ and then H_3O^+
- Tollens' reagent

Q. 15. Primary alkyl halide C_4H_9Br (a) reacted with alcoholic KOH to give compound (b). Compound (b) is reacted with HBr to give (c) which is an isomer of (a). When (a) is reacted with sodium metal it gives compound (d), C_8H_{18} which is different from the compound formed when n-butyl bromide is reacted with sodium. Give the structural formula of (a) and write the equations for all the reactions.

(ii) Out of $C_6H_5CH_2Cl$ and $C_6H_5CHClC_6H_5$, which is more easily hydrolysed by aqueous KOH .

Q. 16. (a) Write the reactions of glucose with (i) HI (ii) HNO_3 (iii) $(CH_3CO)_2O$

(b) Discuss the amphoteric nature of amino acid with suitable example.

Q. 17. (a) Discuss the following

- Denaturation
- invert sugar
- Globular proteins

(b) What is glycogen? How is it different from starch?

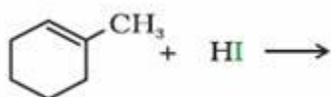
(c) Draw the cyclic structures of anomers of glucose.

Q. 18. (a) Compound **A** of molecular formula C_3H_7Br , yields a compound **B** of molecular formula

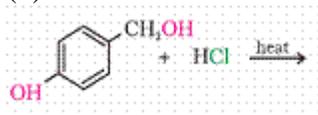
C_3H_8O when treated with aq. NaOH. On oxidation the compound B yields a ketone C. Compound C on treating with methyl magnesium bromide and then H_2O in acidic medium gives tertiary butyl alcohol. Deduce the structures of A, B and C and write the reactions involved. (3 marks)

(b) Draw the structures of major mono halo products in each of the following reactions. (2 marks)

(i)



(ii)



(2 marks)

Or

- i. Carboxylic acid is a stronger acid than phenol. Why? 2
- ii. How will you convert ethanal into the following compounds? 2
 - (i) Butane-1,3-diol
 - (ii) But-2-enal
- iii. Predict the products formed when cyclohexanecarbaldehyde reacts with Semicarbazide and weak acid (1 marks)



Q. 19. (a) Discuss the chemistry involved in Brown ring test for nitrate ion. Give equations also. 2 marks

(b) Complete the following equations: 3

- i. $P_4 + SOCl_2$ -----a
- ii. $4 AgNO_3 + 2H_2O + H_3PO_4$ -----a
- iii. $NaCl + MnO_2 + H_2SO_4$ -----a

Or

(a) Account For the Following: 3

- i. H_3PO_2 act as monobasic acid.
- ii. Interhalogen compounds are more reactive than halogens
- iii. Bond dissociation energy of F_2 is smaller than Cl_2 .

(b) Discuss the quantitative method for estimating O_3 gas. (2 marks)

Q. 20. (I) What are interstitial compounds? Why are such compounds well known for transition metals? (1 marks)

(ii) How is the variability in oxidation states of transition metals different from that of the non transition metals? Illustrate with examples. (1 marks)

(iii) Describe the preparation of potassium dichromate from iron chromite ore. What is the effect of increasing pH on a solution of potassium dichromate? (2 + 1 marks)

Or

(i) Account for the following. (1 x 3 marks)

- a. Sc, the first member of first transition series doesn't exhibit variable oxidation state. Account for the following
- b. Transition metals have a strong tendency to form complexes.
- c. Zirconium (atomic no 40) and hafnium (atomic no 72) exhibit similar properties.

(ii) How does acidified solution of potassium dichromate react with (a) FeSO_4 and (b) H_2S ?

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