



DR. VIRENDRA SWARUP PUBLIC SCHOOL, KALYANPUR

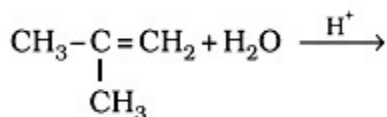
SESSION: 2023 – 24

SUBJECT: CHEMISTRY WORKSHEET

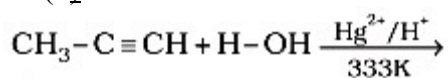
CLASS: XI

1. Benzene reacts with CH_3Cl in the presence of anhydrous AlCl_3 to form
 - a. Chlorobenzene
 - b. Benzyl chloride
 - c. Xylene
 - d. Toluene
2. Benzene molecule has
 - a. 6 σ and 6 π bonds
 - b. 16 σ and 6 π bonds
 - c. 12 σ and 3 π bonds
 - d. 6 σ and 3 π bonds
3. Heating a mixture of sodium benzoate and soda lime gives
 - a. Calcium benzoate
 - b. Benzene
 - c. Sodium benzoate
 - d. Methane
4. An alkene on ozonolysis gives ethanal. Name the alkene.
 - a. But-1-ene
 - b. Propene
 - c. Ethene
 - d. But-2-ene
5. Which among the following is most acidic?
 - a. Ethyne
 - b. Ethene
 - c. Ethane
 - d. Propane
6. Give reasons for the following.
 - (a) Lindlar's catalyst is used for the conversion of alkynes to alkenes
 - (b) In the presence of peroxide, addition of HBr to unsymmetrical alkene takes place contrary to Markovnikov's rule
7. Convert
 - (a) Benzene to Benzene sulphonic acid
 - (b) Ethyne to Benzene
8. Write the IUPAC names of the products obtained when
 - (a) HBr is added to Butene.
 - (b) H_2O is added to Butene in the presence of H^+ .
9. An organic compound (A) with general formula $\text{C}_2\text{H}_4\text{O}_2$ when treated with NaOH forms a compound (B) which on heating with sodalime gives (C). Write the chemical reactions involved.
10. Predict the products.

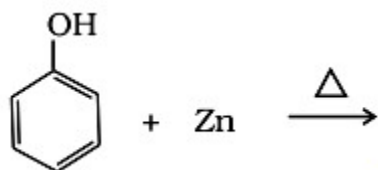
(a)



(b)



(c)



11.
 - (a) Out of benzene, m-dinitrobenzene and toluene which will undergo nitration most easily and why?
 - (b) Wurtz reaction is not preferred for the preparation of alkanes containing odd number of carbon atoms. Justify.
 - (c) Arrange the following set of compounds in order of their decreasing relative reactivity with an electrophile, E^+ , Chlorobenzene, 2,4-dinitrochlorobenzene, p-Nitrochlorobenzene
12. Write the mechanism for the halogenation of CH_4
13. Propanal and pentan-3-one are the ozonolysis products of an alkene?
 - (a) What is the structural formula of the alkene?
 - (b) Write the IUPAC name of the alkene.
 - (c) Write the reaction involved in ozonolysis.

The rotation of carbon-carbon single bond (s-bond), due to cylindrical symmetry of s-MOs (molecular orbitals) long internuclear axis, in alkanes results into different spatial arrangements of atoms in space, that are interconvertible. These arrangements are called conformations.

However, weak repulsive interaction are present between the adjacent bonds in alkanes so the rotation of C—C single bond is not completely free and is hindered by small energy barriers of 1-20 kJ mol⁻¹. The repulsive interaction between the adjacent bond is due to electron cloud. The two types of conformations are very common, i.e., staggered and eclipsed.

The conformation in which the hydrogen atoms attached to the two carbon atoms are as far apart as possible is called the staggered conformation. The conformations in which the hydrogen atoms attached to the two carbon atoms are as close as possible is called eclipsed conformation. Any intermediate conformation between the above two is called skew or gauche conformation.

(a) The different conformers of ethane cannot be separated from each other. Give reason.

(b) What is meant by torsional strain?

(c) Draw the staggered and eclipsed conformers of ethane in Sawhorse projection.

14. What happens when (write equations)

(a) Ethyne is treated with dil. H₂SO₄ in the presence of Hg²⁺.

(b) But-2-ene is treated with Br₂ in CCl₄.

(c) Benzene is heated with Nitrating mixture.

(d) Propene is treated with HBr in the presence of organic peroxide.

(e) Ethanol is heated with con. H₂SO₄

15. (a) Explain the following with reactions.

i. Aromatisation

ii. Pyrolysis

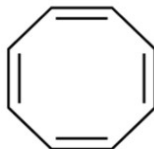
(b) Which among the following is aromatic?



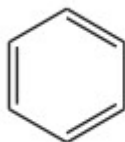
i



ii



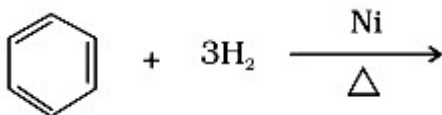
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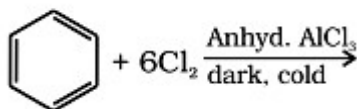
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(c) Complete the reactions.

i.



ii.



16. The I.U.P.A.C. name of CH₃COCH(CH₃)₂ is:

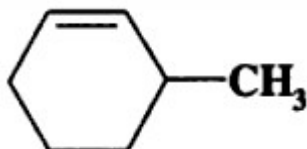
a. 3-methyl-2-butanone

b. Isopropyl methyl ketone

c. 2-methyl-3-butanone

d. 4-methyl isopropyl ketone

17. The I.U.P.A.C. name of



a. 3-Methylcyclohexene

b. 1-methylcyclohex-2-ene.

c. 6-methylcyclohexene

d. 1-methylcyclohex-5-ene.

18. The C-H bond distance is longest in

a. C₂H₂

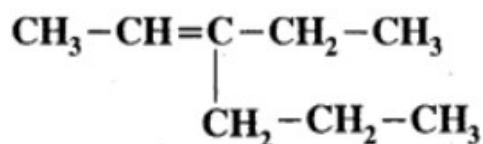
b. C₂H₄

c. C₂H₆

d. C₂H₂Br₂

19. Which of the following is an electrophile?
 a. H₂O b. NH₃ c. AlCl₃ d. C₂H₅NH₂

20. The I.U.P.A.C. name of the following compound is



- a. 3-Ethylhex-2-ene b. 3-Propylhex-2-ene
 c. 3-Propylhex-3-ene d. 4-Ethylhex-4-ene
21. The I.U.P.A.C. name of CH₃ – CH = CH COO C₂H₅ is
 c. Ethyl but-1-enoate b. Ethyl but-2-enoate c. Ethyl prop-2-enoate d. None of these
22. CH₃CH₂Cl undergoes homolytic fission to produce
 a. CH₃CH₂ & Cl b. CH₃CH₂ + & Cl⁻ c. CH₃CH₂⁺ & Cl⁻ d. CH₃CH₂ & Cl⁻

ASSERTION REASON TYPE QUESTIONS

For the following questions, two statements are given- one labelled *Assertion* (A) and the other labelled *Reason* (R). Select the correct answer to these questions from the codes (i),(ii), (iii) and (iv) as given below

- a. Both A and R are true and R is the correct explanation of the assertion.
 b. Both A and R are true but R is not the correct explanation of the assertion.
 c. A is true but R is false.
 d. A is false but R is true.
23. Assertion (A). Simple distillation can help in separating a mixture of propan-1-ol (boiling point 97°C) and propanone (boiling point 56°C)
 Reason (R). Liquids with a difference of more than 20°C in their boiling points can be separated by simple distillation.
24. Assertion (A). Pent-1-ene and pent-2-ene are position isomers.
 Reason (R). Position isomers differ in the position of functional group or a substituent.
 Assertion (A). All the carbon atom in H₂C=C=CH₂ are sp²-hybridised.
 Reason (R). In this molecule all the carbon atoms are attached to each other by double bonds.
25. Explain why alkyl groups act as electron donors when attached to a π system.
26. Explain, how is the electronegativity of carbon atoms related to their state of hybridization in an organic compound?
27. What are electrophiles and nucleophiles? Explain with examples.
28. Write structural formulae for compounds named as-
 a. 1-Bromoheptane b. 5-Bromoheptanoic acid
 c. Give three points of differences between inductive effect and resonance effect.
29. A liquid with a high boiling point decomposes on simple distillation but it can be steam distilled for its purification. Explain how is it possible.
30. Explain hyper conjugation effect. How does hyperconjugation effect explain the stability of alkenes?
31. a. What is isomerism?
 b. Give two examples of structural isomers.
 c. Draw the structural formula of each compound.
32. Read the given passage and answer the questions that follow:
 The movement of electrons in organic reactions can be shown by curved-arrow notation. It shows how changes in bonding occur due to electronic redistribution during the reaction. To show the change in position of a pair of electrons, curved arrow starts from the point from where an electron pair is shifted and it ends at a location to which the pair of electrons may move.
- a. Define inductive effect.
 b. Which of the following is a temporary effect?
 Electromeric effect or Hyper conjugation effect
 c. Differentiate between positive electrometric effect and negative electrometric effect.