



INDIAN SCHOOL AL WADI AL KABIR

Class: XI	DEPARTMENT: SCIENCE (2020-21) SUBJECT: CHEMISTRY	Date of completion: III week of February, 2021
Worksheet No:13 with answers	TOPIC: HYDROCARBONS	Note: A4 FILE FORMAT
NAME OF THE STUDENT	CLASS & SEC:	ROLL NO.

MULTIPLE CHOICE QUESTIONS

- IUPAC name of $(\text{CH}_3)_3\text{CCH}_2\text{C}(\text{CH}_3)_3$ is
 - 2, 2, 3, 3-Tetramethylbutane
 - 2, 2, 4, 4-Tetramethylpentane
 - 2, 2, 4, 4-Tetramethylhexane
 - 1,1,1,3,3,3-Hexamethylpropane
- Name the organic product obtained when isopropyl bromide undergoes Wurtz reaction.
 - Hexane
 - 2,3-Dimethylbutane
 - 2-Methylbutane
 - 2,4-Dimethylhexane
- Ethane can be prepared by decarboxylation from
 - Butane
 - Sodium ethanoate
 - Sodium propanoate
 - Sodium methanoate
- Which of the following compounds can not be prepared by Kolbe's electrolysis?
 - Methane
 - Ethane
 - Propane
 - Butane
- The correct increasing order of boiling point of the following compounds is
 - Pentane < 2-Methylbutane < 2,2-Dimethylpropane
 - Pentane < 2,2-Dimethylpropane < 2-Methylbutane
 - 2-Methylbutane < 2,2-Dimethylpropane < Pentane
 - 2,2-Dimethylpropane < 2-Methylbutane < Pentane

6. Which of the following compounds is not formed when Methane reacts with Chlorine in presence of UV?
- Chloromethane
 - Dichloromethane
 - Trichloromethane
 - Propane
7. The reagent used to prepare Ethene from 1,2-Dibromoethane is
- Conc. H_2SO_4
 - Zn
 - aq. KOH
 - Alcoholic KOH
8. The correct decreasing order of acidic strength of the following compounds is
- $\text{HC} \equiv \text{CH} > \text{H}_2\text{C} = \text{CH}_2 > \text{CH}_3 - \text{CH}_3$
 - $\text{H}_2\text{C} = \text{CH}_2 > \text{CH}_3 - \text{CH}_3 > \text{HC} \equiv \text{CH}$
 - $\text{CH}_3 - \text{CH}_3 > \text{HC} \equiv \text{CH} > \text{H}_2\text{C} = \text{CH}_2$
 - $\text{CH}_3 - \text{CH}_3 > \text{H}_2\text{C} = \text{CH}_2 > \text{HC} \equiv \text{CH}$
9. The final product obtained when Propyne reacts with water in presence of mercuric sulphate and dilute sulphuric acid at 333 K is
- Propanone
 - Propanal
 - Propane
 - Propanoic acid
10. Identify the meta directing group from the following.
- Cl
 - OH
 - CHO
 - NH_2

Read the given passage and answer the questions that follow:

Alkanes contain carbon-carbon sigma (σ) bonds. Electron distribution of the sigma molecular orbital is symmetrical around the internuclear axis of the C-C bond which is not disturbed due to rotation about its axis. This permits free rotation about C-C single bond. This rotation results into different spatial arrangements of atoms in space which can change into one another. Such spatial arrangements of atoms which can be converted into one another by rotation around a C-C single bond are called conformations or conformers or rotamers

- What are skew conformations?
- Draw Sawhorse projections of eclipsed and staggered conformations of Ethane.
- What do you mean by torsional strain?

Assertion and Reason Type

14. Assertion: For alkanes, there is a steady increase in boiling point with increase in molecular mass
Reason: Intermolecular van der Waals forces increase with increase of the molecular size or the surface area of the molecule.
- Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
 - Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
 - Assertion is correct, but reason is wrong statement.
 - Assertion is wrong, but reason is correct statement.
15. Assertion: Benzene prefers addition reactions over substitution reactions.
Reason: This is due to the absence of pure double bond in benzene
- Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
 - Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
 - Assertion is correct, but reason is wrong statement.
 - Assertion is wrong, but reason is correct statement.
16. Assertion: The peroxide effect is not observed in addition of HCl and HI
Reason: Both H–Cl and H–I bonds are too strong to be broken by the free radical.
- Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
 - Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
 - Assertion is correct, but reason is wrong statement.
 - Assertion is wrong, but reason is correct statement.

Question – Answer Type:

17. How will you prepare Ethane from Bromomethane? 1
18. Draw Newman projection of eclipsed conformation of Ethane 1
19. Identify the alkene which on ozonolysis yields Ethanal. 1
20. Identify the reaction condition for the following conversions: 2
- Benzene to Toluene
 - Benzene to Nitrobenzene

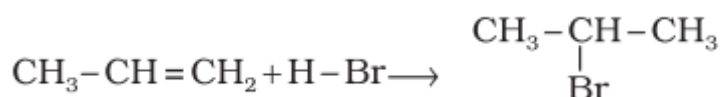
21. With the help of resonance structures, explain directive influence of phenolic (-OH) group. 2

22. Write an equation for the ozonolysis of Propene. 2

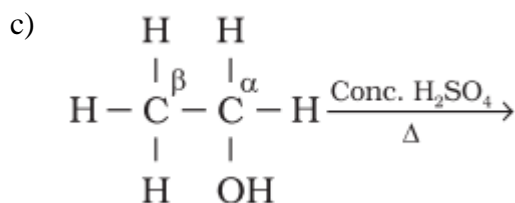
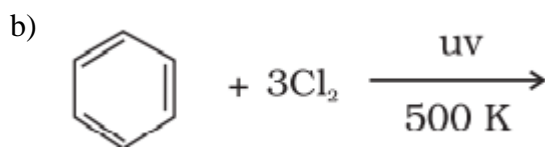
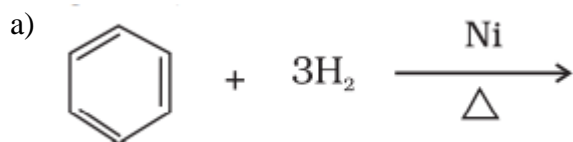
23. Convert the following: 3

- a) Ethanol to Ethene
- b) Ethene to Ethane-1,2-diol
- c) Phenol to Benzene

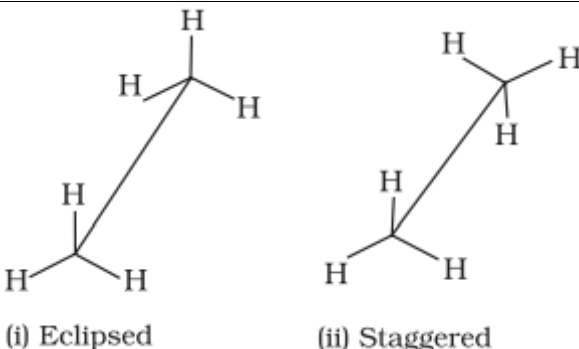
24. Write the mechanism for the following reaction: 3



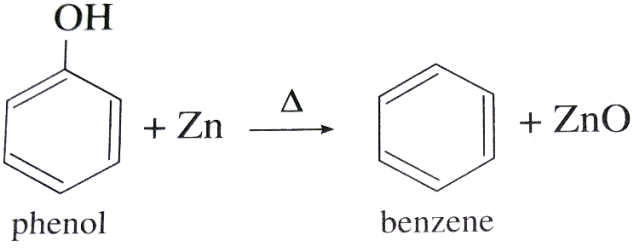
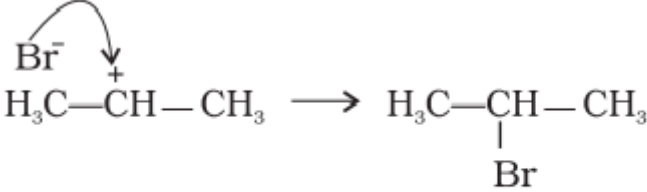
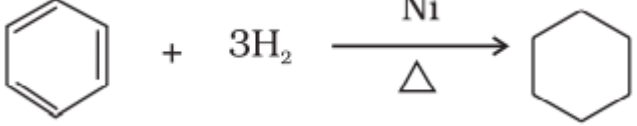
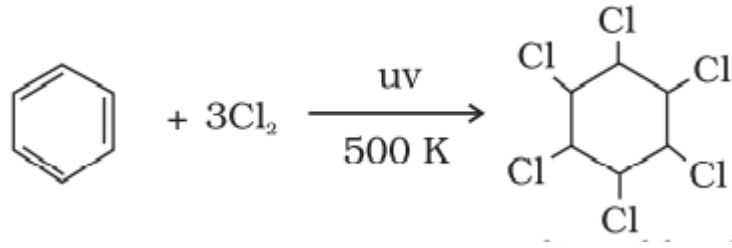
25. Complete the following reactions: 3



ANSWERS

1.	b
2.	b
3.	c
4.	a
5.	d
6.	d
7.	b
8.	a
9.	a
10.	c
11.	Any intermediate conformations other than eclipsed and staggered are called skew conformations.
12.	 <p>(i) Eclipsed (ii) Staggered</p>
13.	Rotation around a C-C single bond is not completely free. It is hindered by a small energy barrier due to weak repulsive interaction between the adjacent bonds. Such a type of repulsive interaction is called torsional strain.
14.	a) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
15.	d) Assertion is wrong, but reason is correct statement.
16.	c) Assertion is correct, but reason is wrong statement.
17.	$\text{CH}_3\text{Br} + 2\text{Na} + \text{BrCH}_3 \xrightarrow{\text{dry ether}} \text{CH}_3-\text{CH}_3 + 2\text{NaBr}$

18.	
19.	But-2-ene
20.	a) Methyl chloride in presence of anhydrous AlCl_3 b) A mixture of conc. HNO_3 and conc. H_2SO_4 at 323-333 K
21.	<p>The electron density is more on o – and p – positions. Hence, the substitution takes place mainly at these positions.</p>
22.	$\text{CH}_3\text{CH}=\text{CH}_2 + \text{O}_3 \longrightarrow \text{CH}_3-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-\text{CH}_2$ <p style="text-align: center;">Propene Propene ozonide</p> $\downarrow \text{Zn} + \text{H}_2\text{O}$ $\text{CH}_3\text{CHO} + \text{HCHO}$ <p style="text-align: center;">Ethanal Methanal</p>
23.	a) $\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}^{\beta}-\text{C}^{\alpha}-\text{H} \\ \quad \\ \text{H} \quad \text{OH} \end{array} \xrightarrow[\Delta]{\text{Conc. H}_2\text{SO}_4} \text{CH}_2=\text{CH}_2 + \text{H}_2\text{O}$ <p style="text-align: center;">Ethene</p> b) $\text{CH}_2=\text{CH}_2 + \text{H}_2\text{O} + \text{O} \xrightarrow[273 \text{ K}]{\text{dil. KMnO}_4} \begin{array}{c} \text{CH}_2-\text{CH}_2 \\ \quad \\ \text{OH} \quad \text{OH} \end{array}$

	<p>c)</p>  <p style="text-align: center;">phenol benzene</p>
24.	$\text{H}_3\overset{3}{\text{C}}-\overset{2}{\text{C}}\text{H}=\overset{1}{\text{C}}\text{H}_2 + \text{H}-\text{Br}$ <p style="text-align: center;">$\downarrow \text{H}^+$</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> $\text{H}_3\text{C}-\overset{+}{\text{C}}\text{H}_2-\text{CH}_2 + \text{Br}^-$ <p>(a) less stable primary carbocation</p> </div> <div style="text-align: center;"> $\text{H}_3\text{C}-\overset{+}{\text{C}}\text{H}-\text{CH}_3 + \text{Br}^-$ <p>(b) more stable secondary carbocation</p> </div> </div> <p style="text-align: center;">  2-Bromopropane (major product) </p>
25.	<p>a)</p>  <p>b)</p>  <p>c)</p> $\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}^{\beta}-\text{C}^{\alpha}-\text{H} \\ \quad \\ \text{H} \quad \text{OH} \end{array} \xrightarrow[\Delta]{\text{Conc. H}_2\text{SO}_4} \text{CH}_2=\text{CH}_2 + \text{H}_2\text{O}$ <p style="text-align: center;">Ethene</p>