CBSE Class 12 Chemistry Chapter 11 Alcohols, Phenols, and Ethers Worksheet with answer – Set 1

Q1. Benzene diazonium chloride reacts with phenol in a weakly basic medium to give
(a) p-hydroxy azo benzene
(b) Chlorobenzene
(c) Diphenyl ether
(d) None of the above

Answer:

(a) Benzene diazonium chloride reacts with phenol in a weakly basic medium to give p-hydroxy azo benzene.

Q2. Phenol reacts with the excess of bromine to yield
(a) Meta Bromo phenol
(b) Ortho and Para Bromo phenol
(c) 2, 4, 6- tribromo phenol
(d) None of the above

Answer

(b) Phenol reacts with the excess of bromine to yield 2, 4, 6- tribromo phenol.

Q3. Dehydration of alcohol is an example of
(a) Elimination reaction
(b) Addition reaction
(c) Substitution reaction
(d) None of the above

Answer:

(a) Dehydration of alcohol is an example of an elimination reaction.

Q4. Phenol is less acidic than
(a) p-nitro phenol
(b) acetic acid
(c) Both (a) and (b)
(d) None of the above

Answer:

(c) Phenol is less acidic than both p-nitro phenol and acetic acid.

Q5. Lucas reagent is the mixture of
(a) Concentrated Hydrochloric acid and anhydrous zinc chloride
(b) Concentrated Nitric acid and anhydrous zinc chloride
(c) Concentrated Hydrochloric acid and hydrous zinc chloride
(d) Concentrated Nitric acid and hydrous zinc chloride

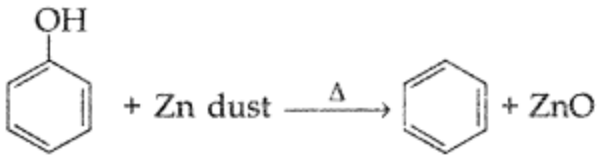
Answer:

(a) Lucas reagent is the mixture of concentrated hydrochloric acid and anhydrous zinc chloride.

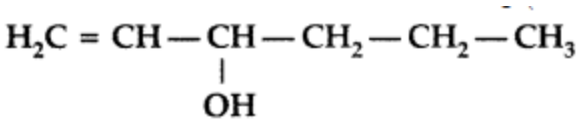
Q6. What happens when phenol is heated with zinc dust?

Answer:

When phenol is treated with zinc dust, benzene and zinc oxide are formed.



Q7. Write the IUPAC name of the below-mentioned compound.



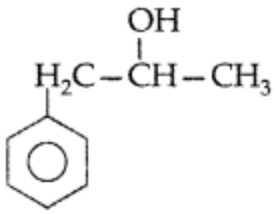
Answer:

The IUPAC name of the compound mentioned above is Hex-1-ene-3-ol or 3 Hexenol.

Q8. Draw the structure of 1-phenyl propane-2-ol.

Answer:

The structure of 1-phenyl propane-2-ol is mentioned below.



1-phenyl propane-2-ol.

Q9. Convert ethanol to ethene.

Answer:

We can convert ethanol to ethene by the dehydration reaction. Ethanol reacts with the concentrated sulphuric acid at 443 K leading to the elimination of water forming ethene.

$CH_3CH_2OH + H_2SO_4 \rightarrow CH_2=CH_2 + H_2O$

Q10. Why does o-nitro phenol have a lower boiling point than p-nitro phenol?

Answer:

O-nitro phenol has a lower boiling point than p-nitro phenol because it forms an intramolecular hydrogen bond, whereas p-nitro phenol forms an intermolecular hydrogen bond.

Q11. Why is the C=O bond of phenol much shorter than the C=O bond of ethanol?

Answer:

The C=O bond of phenol is much shorter than the C=O bond of ethanol because, in phenol, there is delocalisation of electrons, due to which it acquires partial double bond character, while in ethanol, there is a single bond. As the double bond is shorter than the single bond, the C=O bond of phenol is shorter than the C=O bond of ethanol.

Q12. Name a test that can be used to distinguish 2-Pentanone from 3-Pentanone.

Answer:

We can distinguish between 2-Pentanone and 3-Pentanone by using the iodoform test. 2-Pentanone being, methyl ketone, gives a positive iodoform test. In contrast, 3-Pentanone does not give an iodoform test.

Q13. Convert phenol to acetophenone.

Answer:

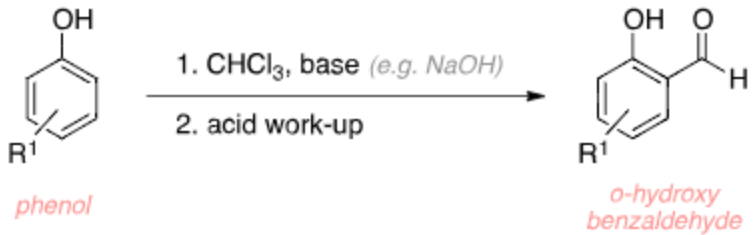
We can convert phenol to acetophenone in two steps.
Step 1: Phenol to Benzene
We will react acetophenone with the zinc dust. Zinc dust reacts with acetophenone to form benzene.
Step 2: Benzene to Acetophenone
We will do an acylation reaction, i.e. we will react benzene with acetyl chloride in the presence of the anhydrous aluminium chloride to form acetophenone.

Reaction:

Q14. What is a reimer tiemann reaction?

Answer:

Reimer Tieman reaction is a substitution reaction used for the ortho formylation of phenol with chloroform in the presence of aqueous NaOH at 340K followed by hydrolysis.

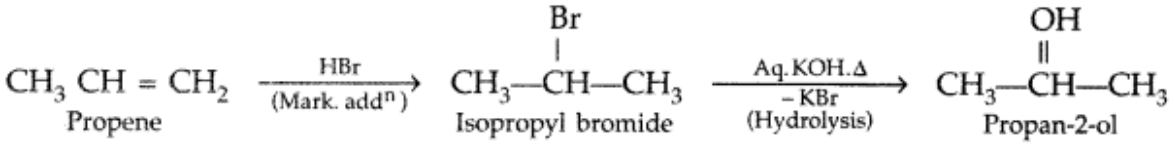


Q15. Convert propene to propane-2-ol.

Answer:

We can convert propene to propane-2-ol by reacting it with hydrobromic acid via an addition reaction followed by a reaction with aqueous potassium hydroxide leading to the substitution of bromide with hydroxide.

Reaction:

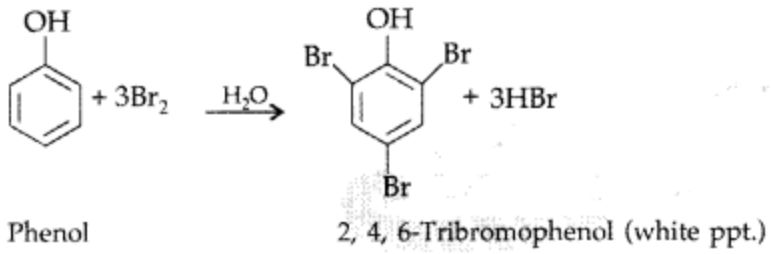


Q16. Convert phenol to 2, 4, 6-tribromo phenol.

Answer:

We can convert phenol to 2, 4, 6-tribromo phenol by reacting it with 3 moles of hydrobromic acid.

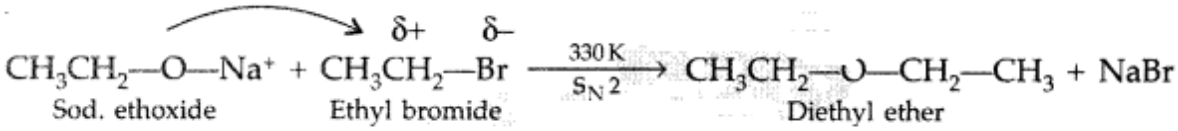
Reaction:



Q17. What is Williamson's synthesis?

Answer:

Williamson's synthesis is a nucleophilic displacement reaction involving the displacement of a halide ion by an alkoxide ion via an S_N^2 reaction mechanism.



Q18. Why are ortho and para nitro phenols more acidic than phenol?

Answer:

Ortho and para nitro phenols are more acidic than phenol because both ortho and para nitrophenol contains an electron-withdrawing group which decreases the electron density in the OH bond of substituted phenol, making it more acidic than the phenol.

Q19. What is denatured alcohol?

Answer:

Denatured alcohol is ethanol with additives to make it poisonous, bad-tasting, foul-smelling, or nauseating to discourage recreational consumption. It is sometimes dyed so that it can be identified visually.
Pyridine and methanol are added to ethanol to denature it.

Q20. Write a chemical test to distinguish between ethanol and ethanoic acid.

Answer:

We can distinguish between ethanol and ethanoic acid by reacting it with sodium hydrogen carbonate. Ethanoic acid reacts with the sodium hydrogen carbonate to liberate carbon dioxide and water while ethanol does not react with sodium hydrogen carbonate.
$CH_3COOH + NaHCO_3 \rightarrow CH_3COONa + H_2O + CO_2$
$CH_3CH_2OH + NaHCO_3 \rightarrow$ No reaction