

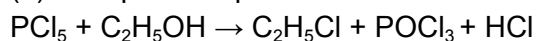
CBSE Class 12 Chemistry Chapter 11 Alcohols, Phenols, and Ethers Worksheet with Answer– Set 2

Q1. Phosphorous pentachloride reacts with the ethanol to yield

- (a) Ethylene chloride
- (b) Ethyl chloride
- (c) Both (a) and (b)
- (d) None of the above

Answer:

(b) Phosphorous pentachloride reacts with the ethanol to yield ethyl chloride.



Q2. What is the electrolytic product of 20% aqueous sodium chloride solution and ethanol?

- (a) Chloroform
- (b) Ethyl chloride
- (c) Formaldehyde
- (d) None of the above

Answer:

(a) The electrolytic product of 20% aqueous sodium chloride solution and ethanol is chloroform.

Q3. Which of the following will give a positive iodoform test?

- (a) 1-pentanal
- (b) 2-pentanone
- (c) 3-pentanal
- (d) None of the above

Answer:

(b) 2-pentanone has a methyl ketone, thus it will give a positive iodoform test.

Q4. What happens when ethanol reacts with methyl magnesium bromide?

- (a) Methane
- (b) Ethane
- (c) Propane
- (d) None of the above

Answer:

(a) Methane is formed when ethanol reacts with methyl magnesium bromide.

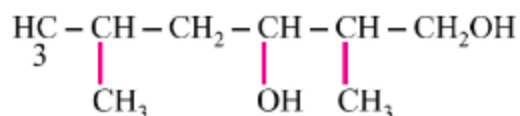
Q5. What is the molecular formula of chloral hydrate?

- (a) $\text{CCl}_3\text{CH}(\text{OH})_2$
- (b) $\text{CCl}_3\text{COCH}_3$
- (c) $\text{CCl}_3\text{COCCl}_3$
- (d) None of the above

Answer:

(a) The molecular formula of chloral hydrate is $\text{CCl}_3\text{CH}(\text{OH})_2$.

Q6. Write the IUPAC name of the below-mentioned compound.



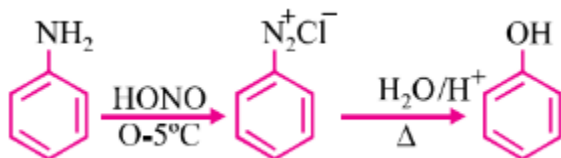
Answer:

The IUPAC name of the compound mentioned above is 2,5- Dimethyl hexane-1, 3 diol.

Q7. Convert aniline to phenol.

Answer:

Aniline reacts with the nitrous acid between 0 to 50 C to form benzene diazonium chloride, which on further hydrolysis, gives phenol.



Q8. Why is phenol acidic in nature?

Answer:

Phenol is acidic in nature because phenoxide ion is more stable than corresponding phenol. In phenoxide ion, the negative charge is on an electronegative oxygen atom, while in phenol, there is a positive charge on the electronegative oxygen, which decreases the stability of phenol over phenoxide ion, making phenol acidic.

Q9. Name a compound which is used as an antiseptic as well as a disinfectant.

Answer:

Phenol is used as an antiseptic and a disinfectant. A 0.2 % solution of phenol works as an antiseptic, while a 2 % solution of phenol works as a disinfectant.

Q10. What is a nitrating mixture?

Answer:

A mixture of sulphuric acid and nitric acid is known as a nitrating mixture.

Q11. Why is lower alcohol soluble in water while higher alcohol is insoluble in water?

Answer:

Lower alcohol is soluble in water, and the solubility decrease with the increase in molecular weight. It is because lower alcohol forms a hydrogen bond with the highly polarised OH group. However, in the higher alcohols, the alkyl chain of molecules increases and molecules tend to resemble hydrocarbons which are insoluble in the water. When the ratio of C to CH is more than 4, alcohol loses its solubility.

Q12. What will happen if ethanol is heated with red phosphorous and hydroiodic acid?

Answer:

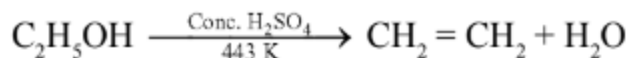
On heating ethanol with red phosphorous and hydroiodic acid, ethane, iodine and water are formed.



Q13. Convert ethanol to ethene.

Answer:

We can convert ethanol to ethene by the dehydration reaction leading to the elimination of water and formation of the resulting product, i.e. ethene.



Q14. What is ether? Why are they used as a solvent?

Answer:

Ethers are compounds in which the oxygen atom is linked with two alkyl groups. They have a general formula of (R-O-R') and are typically used as a solvent. It is because of the fact that they are relatively inert and do not react with the solute particles.

Q15. What is power alcohol?

Answer:

A mixture of 20% ethanol and 80% gasoline is known as power alcohol.

Q16. Why does phenol not give protonation reactions readily?

Answer:

Phenol does not give protonation reaction readily because of resonance and positive charge on the electronegative oxygen atom. It does not accept a proton easily, thereby descending the protonation of the phenol.

Q17. Why is ether inert?

Answer:

Ether is inert because there is no active site in the ether molecule. In it, divalent oxygen is linked to carbon atoms on both sides (R-O-R'), making ether inert.

Q18. Why is dehydration of alcohol carried out with sulphuric acid and not nitric acid or hydrochloric acid?

Answer:

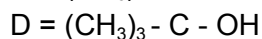
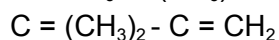
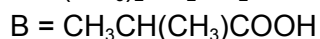
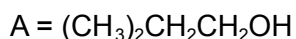
Dehydration of alcohol is carried out with sulphuric acid and not nitric acid or hydrochloric acid because chloride is a strong nucleophile if hydrochloric acid is used. It will displace the hydroxide group of the alcohol and will lead to a nucleophilic substitution reaction. In contrast, if nitric acid is used, it is a potent oxidising agent that will oxidise alcohol to the carboxylic acid.

Thus, only sulphuric acid is used to dehydrate the alcohols, not nitric acid or hydrochloric acid.

Q19. An alcohol A ($C_4H_{10}O$) on oxidation with acidified $K_2Cr_2O_7$ gives carboxylic acid B ($C_4H_8O_2$). Compound A when dehydrated with concentrated H_2SO_4 at 443 K gives compound C with aqueous H_2SO_4 . C gives compound D ($C_4H_{10}O$) which is an isomer of A. Compound D is resistant to oxidation but compound A can be easily oxidized. Identify A, B, C and D and write their structure.

Answer:

Here,



Q20. An ether A ($C_5H_{12}O$), when heated with excess of hot concentrated HI, produced two alkyl halides which on hydrolysis gives compounds B and C. Oxidation of B gives an acid D, whereas oxidation of C gives a ketone E. Deduce the structures of A, B, C, D and E.

Answer:

Here,

