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Class: 12
Subject: Chemistry
Topic: Organic Chemistry of O compounds
No. of Questions: 20
Duration: 60 Min
Maximum Marks: 60

1. Rectified spirit is converted to absolute alcohol taking advantage of the fact that benzene - alcohol - water is a ternary azeotropic mixture, benzene -, alcohol is a binary azeotropic mixture and the boiling points of the two mixtures stand in relation to the boiling point of alcohol in the following descending order

A. alcohol, ternary mixture, binary mixture
B. alcohol, binary mixture, ternary mixture
C. binary mixture, alcohol, ternary mixture
D. ternary mixture, binary mixture, alcohol

Ans. B

Solution:

Boiling point of the ternary mixture being lowest, it distills out first. The binary mixture of benzene and alcohol having intermediate boiling point distills next. Alcohol with the highest boiling is left over

2. An aldehyde can be obtained by the dehydrogenation of an alcohol. The catalyst used in the reaction is

A. conc. H_2SO_4
B. copper
C. nickel
D. Pd

Ans. B

Solution:

Conc. H_2SO_4 is a dehydrating agent, depending on the conditions either alkene or an ether is the product. Ni and Pd act as reducing catalyst. Hence the dehydrogenating catalyst, Cu is chosen

3. Which one of the following is the weakest acid?

A. Phenol
B. p-cresol
C. p-chlorophenol
D. p-nitrophenol

Ans. B

Solution:

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CH_3 - group. of cresols being electron donor in character, increases the electron density around the phenolic group. Hence the process of protonation becomes more difficult than phenol. Hence cresol is a weaker acid than phenol. In chloro and nitrophenols the
- Cl and
$-NO_2$ group are electron withdrawing group. Hence they increase the acidity of phenol. Hence they are stronger acids than phenol.
Hence option 2 is the correct choice

4. The reagent with which both acetaldehyde and acetone readily react is
   A. Tollen's reagent
   B. Schiff's reagent
   C. Fehling's solution
   D. Grignard reagent

Ans. D

Solution:

Grignard reagents react with both aldehydes and ketones to give the addition products which on hydrolysis give alcohols

5. The hydrogen atom of the phenolic group can be displaced

   A. only by using metallic sodium
   B. by using either metallic sodium or sodium hydroxide
   C. by using sodium carbonate
   D. by using sodium chloride

Ans. B

Solution:

$2C_6H_5OH + 2Na \longrightarrow 2C_6H_5ONa + H_2\uparrow$. In this reaction H atom is displaced

$C_6H_5OH + NaOH \longrightarrow C_6H_5ONa + H_2O$

6. Name the end product C in the series $CH_3COOH \xrightarrow{NH_3} A \xrightarrow{heat} B \xrightarrow{P_2O_5} C$

   A. CH_4
   B. CH_3OH
   C. CH_3CN
   D. CH_3CONH_2

Ans. C

6. Name the end product C in the series $CH_3COOH \xrightarrow{NH_3} A \xrightarrow{heat} B \xrightarrow{P_2O_5} C$

A. CH_4

B. CH_3OH

C. CH_3CN

D. CH_3CONH_2

7. Which of the following reagents cannot be used to differentiate phenol and ethanol?

A. Neutral $FeCL_3$

B. Na – metal

C. Bromination

D. L_2 snf NaOH

Ans. B

Solution :

Detailed Answer::
Neutral ferric chloride test and bromination tests are answered only by phenol while ido form test (I_2 and NaOH) is answered only byethanol. Na metal test is answered by both phenol and ethanol. Hence cannot be used

8. When mixture of ethyl alcohol vapour and air is passed over silver or copper catalyst maintained at 250 300ºC, which one of the following compounds is produced ?

A. CH_3CHO
B. CH_3COOH
C. $CH_2 = CH_2$
D. d.$C_2H_5 – O – C_2H_5$

Ans. A

Solution:

$$2C_2H_5OH + O_2 \xrightarrow{Cu \text{ or } Ag} 2CH_3CHO + 2H_2O$$

9. Compound $A + NH_3 \longrightarrow B \xrightarrow{heat}$ Amide. The compound A is an

A. amide
B. amine
C. acid
D. ester

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Ans. C

Solution:

$$\underset{\text{(acid)}}{RCOOH} \xrightarrow{NH_3} \underset{\text{(b)}}{RCOONH_4} \xrightarrow{\text{heat}} RCONH_2 + H_2O$$

10. When a strong aqueous solution of sodium acetate is electrolysed, the gas liberated at the anode is
    A. methane
    B. ethane
    C. hydrogen
    D. carbon dioxide

Ans. B

Solution:
$CH_3COONa \rightarrow CH_3COO^- + Na$ .At the cathode hydrogen is evolved. At the anode CH^3COO^- ions get discharged as (CH^3COO) groups. These do not have free existence. Hence 2 such radicals jointly decompose giving ethane and carbon dioxide. $2CH_3COO^- \rightarrow C^2 + 2CO^2$. This reaction is called Kolbe's reaction

11. Which one of the following is used as a food preservative ?
    A. Acetic acid
    B. Acetyl salicylic acid
    C. Salol
    D. Sodium benzoate

Ans. D

12. A tertiary alcohol is represented by the general formula
    A. RCH_2OH
    B. R_2CHOH
    C. R_3COH
    D. none of these

Ans .c

13. Denatured alcohol is
    A. rectified spirit
    B. undistilled ethanol
    C. rectified spirit + methanol + naphtha
    D. 50% ethanol + 50% methanol

Ans. C

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14. Which of the following decolourises $KMnO_4$?
    A. HCOOH
    B. CH_3NH_2
    C. C6H5NH2
    D. CH3COOCH3

ans. A

solution:
The aldehyde group of formic acid gets oxidised with acidified $KMnO_4$ Hence pink colour is discharged

15. Which of the following is not a monohydric alcohol?
    A. benzyl alcohol
    B. glycerol
    C. isopropyl alcohol
    D. ethanol

Ans. B
solution::
Glycerol contains three - OH groups in a molecule of it. So it is a tri hydric alcohol. All the rest containing one - OH in a molecule aremonohydric alcohols

16. Heating a mixture of calcium formate and calcium acetate producess
    A. acetone
    B. ethyl alcohol
    C. ethane
    D. acetaldehyde

Ans. D

Solution:
$(CH_3\ COO)_2\ Ca + (HCOO)_2\ Ca \rightarrow 2CH_3CHO + 2CaCO3$.Calcium acetate gives the CH_3- and calcium formate give the aldehyde group.Thus the product formed is acetaldehyde (CH_3 CHO).A mixed ketone is one where two different groups are attached to C = O group

17. Carbolic acid is
    A. formic acid
    B. acetic acid
    C. salicylic acid
    D. phenol

Ans. D

18. Isopropyl alcohol on passing over heated copper at 300°C gives
    A. propylene
    B. acetaldehyde
    C. acetone
    D. propane

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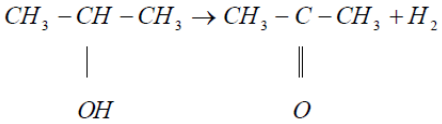
Ans. C

Solution :



19. Benzaldehyde is obtained by oxidation of toluene using
    A. acidified potassium dichromate
    B. chromyl chloride
    C. acidified potassium permanganate
    D. alkaline potassium permanganate

Ans:: B

20. Tollen's reagent contains
    A. $[AG(NH_3)_2]^+$ ions
    B. $[CU(OH)_4]^{2-}$
    C. Ag_2O
    D. Cu_2o

ans. A

solution: A

To prepare Tollen's reagent silver nitrate is treated with NaOH to get a brown precipitate of silver oxide which is dissolved in
ammonia to get $[Ag(NH_3)^2]+$ ions