Studentpad

NEET 2021-22

Time : 90 Min	Chem : Full Portion Paper	Marks : 180

Hints and Solutions

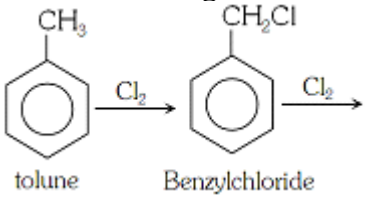
01) Ans: **4)** $[Ag^+]^2[CrO_4^{-2}]$

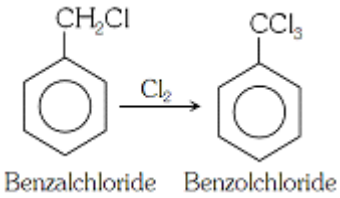
Sol: $Ag_2CrO_4 \rightleftharpoons [2Ag^+] + [CrO_4^{--}]$

$\therefore K_{sp} = [Ag^+]^2\,[CrO_4^{--}]$

02) Ans: **3)** benzyl chloride.

Sol: Side chain chlorination as well as bromination is favoured by high temperature, light and in absence of halogen carrier.





03) Ans: **2)** CO and CO_2

04) Ans: **2)** molar concentration.

05) Ans: **3)** C_2H_5ONa

Sol: Because there is no direct bonding between the metal atom and the carbon atom.

06) Ans: **4)** 5

Sol: Here, $MnO_4^- + 8H^+ + 5e^- \rightleftharpoons Mn^{++} + 4H_2O$

07) Ans: **3)** E

Sol: When k increases, rate of reaction also increases, $k = \frac{pz}{e^{E/RT}}$. For k to increase, p, z, T should increase and E should decrease $(e \approx 2.7)$.

08) Ans: **1)** $NaBH_4$

Sol: $NaBH_4$ as well as $LiAlH_4$ attack only carbonyl group and reduce it into alcohol group. They do not attack on double bond.

$$\underset{\text{cinnamic aldehyde}}{C_6H_5 - CH = CHCHO} \xrightarrow{NaBH_4}$$

$$\underset{\text{cinnamic alcohol}}{C_6H_5 - CH = CH.CH_2OH}$$

09) Ans: **1)** Reduction of Fehling solution

Sol: $HCOOH + 2Cu^{+2} \xrightarrow[\text{Solution}]{\text{Fehling}} \underset{\text{Red ppt}}{Cu_2O} + H_2O + CO_2$

While $CH_3COOH \xrightarrow[\text{Solution}]{\text{Fehling}}$ No reaction

10) Ans: **2)** sp^2

Sol: Here in HCHO, carbon is sp^2 hybridized.

$$H - \underset{sp^2}{\overset{H}{\overset{|}{C}}} = O$$

11) Ans: **1)** Both Statement 1 and Statement 2 are true but Statement 2 is not the correct explanation of Statement 1

Sol: White phosphorus exists P_4 tetrahedral molecule having P-P-P bond angle 60^0. Hence, the molecule is under strain and more reactive. On the other hand red phosphorus exists as P_4 tetrahedral which are joined together through covalent bonds giving polymeric structure.

12) Ans: **4)** two moles of ammonia.

Sol: Here, $Mg_3N_2 + 6H_2O \rightarrow 3Mg(OH)_2 + 2NH_3$

13) Ans: **1)** $M(NO_3)_3$

Sol: In MPO_4, the oxidation state of M is +3. So, the formula of nitrate is $M(NO_3)_3$.

14) Ans: **4)** Both 1 & 3

15) Ans: **1)** hydrolysis.

16) Ans: **2)** atomic radius.

17) Ans: **1)** 3-N, N dimethyl amino-3- methyl pentane

18) Ans: **1)** replication.

Sol: Multiplication of DNA is termed as replication.

19) Ans: **1)** D_2O.

Sol: D_2O which has $D = {}_1H^2$.

20) Ans: **1)** HCHO

21) Ans: **3)** Aqueous KOH

Sol: $C_2H_5Cl + \underset{(aq)}{KOH} \rightarrow C_2H_5OH + KCl$

22) Ans: **1)** $Mg(OH)_2$

Sol: On heating, $Mg(OH)_2$ sublimes.

23) Ans: **2)** Smelting

Sol: The process of smelting is used for reduction of oxide to convert it into metal.

24) Ans: **1)** xanthoproteic test

Sol: Protein + conc. HNO_3 $\rightarrow$ Yellow colour. This

test is given by a protein which contains α-amino acids having a benzene ring such as tyrosine, phenylalanine etc. The yellow colour is because of nitration of benzene ring.

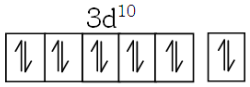
25) Ans: **2)** Dry $HCl + C_2H_5OH$

Sol:

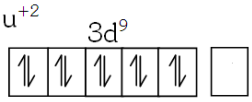
$$RCOOH + C_2H_5OH \xrightarrow[HCl]{dry} RCOOC_2H_5 + H_2O$$

26) Ans: **1)** Cuprous ion has a completed d -orbital and cupric ion has an incomplete d -orbital

Sol: Cuprous ion (Cu^+) $3d^{10}$ Completely filled d sub shell



Cupric ion Cu^{+2}



1unpaired electron

27) Ans: **2)** Bosch process.

Sol: It represents Bosch process.

28) Ans: **3)** tropopause

Sol: The point of temperature inversion between troposphere and ionosphere is known as tropopause. In the region lower to tropopause, temperature decreases with increase of altitude on the other hand in the region upper to tropopause temperature increases with increase of altitude.

29) Ans: **3)** $\Delta H = T\Delta S$

Sol: $H_2O_{(g)} \rightleftharpoons H_2O_{(l)}$

We know, $\Delta G = \Delta H - T\Delta S$

Now, at equilibrium $\Delta G = 0$ $\therefore \Delta H = T\Delta S$

30) Ans: **2)** anode and cathode

Sol: Electrolysis involves oxidation and reduction respectively at anode and cathode.

31) Ans: **4)** All of these

Sol: All H_2SO_4, Al_2O_3 and H_3PO_4 can work as dehydrating agent.

32) Ans: **1)** zero.

Sol: This space is called nodal space where there is no possibility of presence of electrons.

33) Ans: **4)** $RCOOK \xrightarrow{\text{Oxidation Electrolysis}}$

Sol: $R\text{–}COOK + 2H_2O \xrightarrow{\text{Electrolysis}} \underset{\text{Alkane}}{R-R} + CO_2 + 2KOH + H_2$

34) Ans: **4)** 1.857×10^{-8} cm

Sol: If bcc lattice, Radius of Na $= \dfrac{\sqrt{3}a}{4}$

$= \dfrac{\sqrt{3} \times 4.29}{4} = 1.8574$ Å $= 1.8574 \times 10^{-8}$ cm

35) Ans: **2)** 2

Sol: The concentration of $[H^+] = 10^{-2}$ mole/litre

$\therefore pH = -\log[H^+] = -\log[10^2]$ i.e. pH = 2

36) Ans: **1)** yellow fever.

Sol: Yellow fever was the first viral disease, which was detected in human being.

37) Ans: **4)** $H_2O + S$

Sol: $2H_2S + O_2 \rightarrow 2H_2O + 2S$

38) Ans: **1)** chemical separation.

Sol: Chemical separation also known as leaching. In this method, powdered ore is treated with a suitable reagent which can dissolve the ore but not the impurities.

39) Ans: **1)** Both statement 1 and statement 2 are true and the statement 2 is the correct explanation of the statement 1.

Sol: K and Cs emit electrons on exposure to light, therefore both are used in photoelectric cells. Here, statement 1 and statement 2 are true and statement 2 is a correct explanation.

40) Ans: **1)** 7.4×10^{-2}

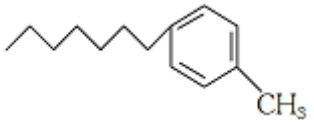
Sol: $K_p = K_c(RT)^{\Delta n}$, where R = Gas constant

$$K_c = \frac{K_p}{(RT)^{\Delta n}} = \frac{1.3 \times 10^{-3}}{(0.0821 \times 700)^{-1}} = 7.4 \times 10^{-2}$$

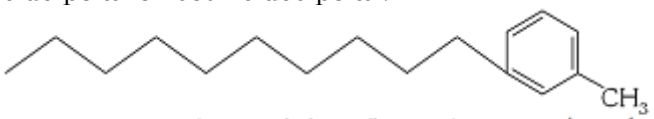
41) Ans: **2)** the chemical energy of $H_2(g)$ and $O_2(g)$ is more than that of water.

Sol: The chemical energy of $H_2(g)$ and $O_2(g)$ is more than that of water.

42) Ans: **1)**



Sol: Benzene has non polar nature. As we know that non-polar disperses more to non-polar substances. Hence, meta-methyl nonylbenzene being non polar from both sides will disperse more to benzene. All other substances have either one side polar or both sides polar.



non-polar end (metamethyl nonylbenzene) non-polar end

$\equiv H_{19}C_9 - C_6H_4 - CH_3$

43) Ans: **3)** Secondary > Tertiary > Primary

44) Ans: **2)** Cl^-

Sol: Because of full filled d-orbital Cl^- has a spherical symmetry.

45) Ans: **2)** work done per degree per mole.