Sample Paper-01

Dropper NEET (2024)

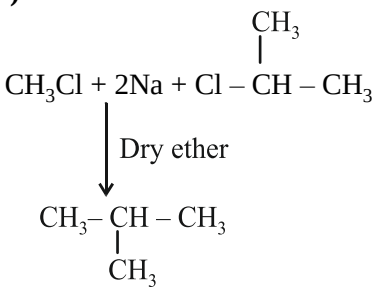
CHEMISTRY

ANSWER KEY

1.	(1)	26.	(2)
2.	(4)	27.	(3)
3.	(2)	28.	(1)
4.	(2)	29.	(4)
5.	(2)	30.	(3)
6.	(3)	31.	(1)
7.	(2)	32.	(1)
8.	(2)	33.	(1)
9.	(4)	34.	(2)
10.	(4)	35.	(4)
11.	(4)	36.	(1)
12.	(1)	37.	(2)
13.	(3)	38.	(3)
14.	(4)	39.	(4)
15.	(2)	40.	(3)
16.	(2)	41.	(3)
17.	(1)	42.	(4)
18.	(4)	43.	(3)
19.	(1)	44.	(1)
20.	(1)	45.	(1)
21.	(2)	46.	(4)
22.	(2)	47.	(4)
23.	(2)	48.	(2)
24.	(2)	49.	(2)
25.	(4)	50.	(1)

HINTS AND SOLUTION

1. **(1)**



2. **(4)**

$A_2 \rightarrow 2A$

K.E. = $h\upsilon - h\upsilon_0$

$= 4.4 \times 10^{-19} - 4.0 \times 10^{-19}$

$= 0.4 \times 10^{-19}$ J

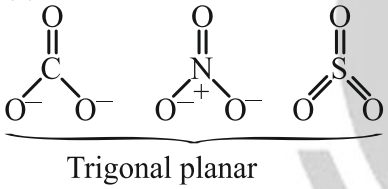
$= 4 \times 10^{-20}$ J

K.E. per atom = 2×10^{-20} J

3. **(2)**

$$\lambda = \frac{12.3}{\sqrt{V}} \text{ Å}$$

4. **(2)**



5. **(2)**

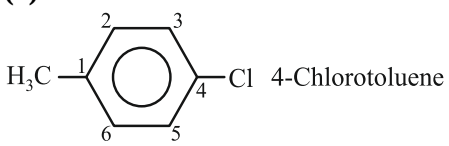
$H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$

For the given reaction, on increasing temperature K_C decreases, that implies reaction is exothermic.

6. **(3)**

Addition of electron to O^- is endothermic as O^- will tend to resist the addition of further electron due to inter electronic repulsions.

7. **(2)**



8. **(2)**

$$pOH = pK_b + \log\frac{[salt]}{[base]}$$

$[NH_4OH] = [NH_4Cl] = 0.1$ M

$pOH = pK_b$

$14 - pH = pK_b$

$pK_b = 14 - 9.25 = 4.75$

9. **(4)**

CH_4

$\downarrow$

PbH_4

(E = C, Si, Ge, Sn, Pb)

Due to decrease in E – H bond strength down the group, reducing nature increases.

10. **(4)**

Clemmensen reduction

11. **(4)**

$$n_C = \frac{24}{12} = 2$$

$$n_H = \frac{4}{1} = 4$$

$$n_O = \frac{32}{16} = 2$$

Empirical formula

C:H:O

2:4:2

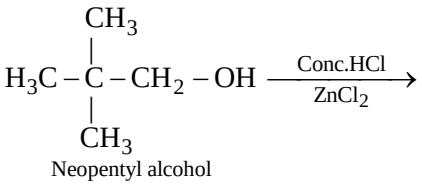
1:2:1

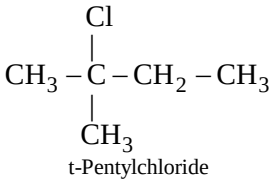
CH_2O

12. **(1)**

There is no possibility of d-d transition.

13. **(3)**





14. **(4)**

$$CH_3CH_2-\overset{O}{\overset{\|}{C}}-OC_2H_5 \xrightarrow[H_2O^*]{Na\overset{*}{O}H} CH_3CH_2-\overset{O}{\overset{\|}{C}}-\overset{*}{O}^- + CH_3-CH_2-\overset{\overset{*}{O}}{\overset{\|}{C}}-O^-$$

15. **(2)**

Denaturation disrupts only secondary and tertiary structures of proteins.

16. **(2)**

$d^5 \rightarrow \underbrace{t_{2g}^3\ e_g^2}_{5 \text{ unpaired } e^-s}$ (weak field ligand)

$d^5 \rightarrow \underbrace{t_{2g}^5\ e_g^0}_{1 \text{ unpaired } e^-}$ (Strong field ligand)

17. **(1)**

$CuSO_4$ solution absorbs orange-red colour and appears blue (complimentary to the colour absorbed).

18. **(4)**

KCl is not present in dry cell.

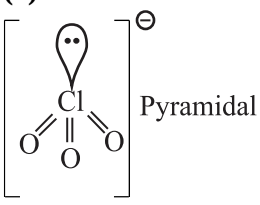
19. **(1)**

$$\underset{\text{Sucrose}}{C_{12}H_{22}O_{11}} + H_2O \rightarrow \underset{\text{D–Glucose}\ (52^o)}{C_6H_{12}O_6} + \underset{\text{D–Fructose}\ (-92^o)}{C_6H_{12}O_6}$$

Specific rotation $= \frac{1}{2}\left(52^o + \left(-92^o\right)\right)$

$= -20^o$

20. **(1)**



Pyramidal

21. **(2)**

$$\frac{K_P}{K_C} = RT^{\Delta n_g}$$

Where (Δn_g = number of gaseous mole of product – number of gaseous mole of reactant)

22. **(2)**

Salt contains Zn^{2+}

23. **(2)**

Number of spectral lines $= \frac{(n_2 - n_1)(n_2 - n_1 + 1)}{2}$

$= \frac{(7-2)(7-2+1)}{2} = 15$

24. **(2)**

According to Arrhenius equation, rate of a reaction increases with decrease in activation energy.

25. **(4)**

Faraday's first law of electrolysis,

$W = Z \times I \times t$

where, Z = electrochemical equivalent (g/C)

I = current (Amps)

t = time (sec)

$W = \frac{63.6}{2 \times 96500} \times 0.5 \times 60 \times 60$

W = 0.56 g.

26. **(2)**

Solubility of $AgCl$ in water $= \sqrt{K_{sp}} = S_1$

In $0.01M\ CaCl_2$, it is given by,

$K_{sp} = S_2 \times \left(0.01 \times 2 + S\right) \left(\because S_2 = \frac{K_{sp}}{0.02}\right)$

In $0.01\ M\ NaCl$, it is given by

$K_{sp} = S_3 \times \left(0.01 + S\right) \left(\because S_3 = \frac{K_{sp}}{0.01}\right)$

In $0.05M\ AgNO_3$, it is given by

$K_{sp} = S_4 \times \left(0.05 + S\right) \left(\because S_4 = \frac{K_{sp}}{0.05}\right)$

The solubilities are derived by neglecting S in comparison to $0.02, 0.01$ and 0.05.

So, order of solubilities:

$S_1 > S_3 > S_2 > S_4$

27. **(3)**

The rate constant for first order reaction does not depends on initial concentration of reactants.

28. **(1)**

A nucleophilic addition reaction is a chemical addition reaction in which a nucleophile forms a sigma bond with an electron-deficient species.

29. **(4)**

Buffer is a solution of weak acid and conjugate base of weak acid or a weak base and a conjugate acid of weak base, e.g. $NH_4Cl + NH_4OH$, $CH_3COOH + CH_3COONa$, $NaCN + HCN$

30. **(3)**

Acetate ion is more resonance stabilized than phenoxide ion.

31. **(1)**

$\underset{\uparrow sp}{CH \equiv CH}, \underset{\uparrow sp^2}{CH_2 = CH_2}, \underset{\uparrow sp^3}{CH_3 - CH_3}$

Electronegativity of carbon atom:

$sp > sp^2 > sp^3$.

$\therefore$ Acidic character follows the order

$CH \equiv CH > CH_2 = CH_2 > CH_3 - CH_3$

Hence, order of basic strength:

$\underset{(I)}{CH \equiv \overset{\ominus}{C}} < \underset{(II)}{CH_2 = \overset{\ominus}{C}H} < \underset{(III)}{CH_3\overset{\ominus}{C}H_2}$

32. **(1)**

$CH_3 - CH_3 \rightarrow 2\ sp^3$ carbons

$CH_2 = CH_2 \rightarrow 2\ sp^2$ carbons

$CH \equiv CH \rightarrow 2$ sp carbons

 $\rightarrow 6\ sp^2$ carbons

33. **(1)**

Molecular orbital electronic configuration-

$(\sigma 1s^2)(\sigma^* 1s^2)(\sigma 2s^2)(\sigma^* 2s^2)\ (\sigma 2p_z^2)(\pi 2p_x^2)(\pi 2p_y^2)$

$(\pi^* 2p_x^2)(\pi^* 2p_y^2)$

Number of electrons in bonding MOs = 10

Number of electrons in anti-bonding MOs = 8

34. **(2)**

When $T \rightarrow \infty$

then K = A

35. **(4)**

All of the above given statements are correct.

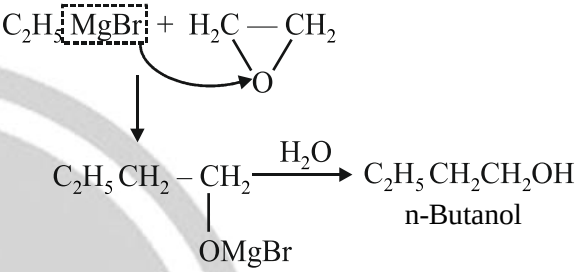
36. **(1)**

Alkyl fluorides which cannot be prepared by Finkelstein reaction is best accomplished by Swarts reaction. In this reaction, the corresponding fluoride is obtained by the action of mercurous fluoride or antimony trifluoride on corresponding chlorides.

The reaction is as follows:

$2CH_3Cl + Hg_2F_2 \rightarrow 2CH_3F + Hg_2Cl_2$

37. **(2)**



38. **(3)**

$Al_2O_3 \rightarrow 2Al^{3+} + 3O^{2-}$

$Al^{3+} + 3e^- \rightarrow Al$

$\because$ 3F charge gives Al = 27 g

$\therefore$ 2F charge will give Al $= \frac{27}{3} \times 2 = 18$ g

[1 mole e^- = 1F charge]

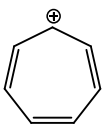
39. **(4)**

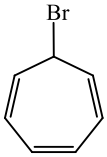
$K_2Cr_2O_7 + 7H_2SO_4 + 6KI \rightarrow Cr_2(SO_4)_3 + 3I_2 + 7H_2O + 4K_2SO_4$

40. **(3)**

Ammoniacal silver nitrate

41. **(3)**

Tropylium ion,  is an aromatic species.

Therfore,  will react fastest with $AgNO_3$ solution.

42. **(4)**

If A–B interactions > A–A or B–B interactions then mixture shows negative deviation from Raoult's law.

Hexane + Heptane	:	No deviation
Benzene + Toluene	:	No deviation
Water + Ethanol	:	+ve deviation
Nitric acid + Water	:	–ve deviation

43. **(3)**

Among all monosaccharides and all disaccharides, only sucrose is a non-reducing sugar.

44. **(1)**

The balanced reaction is:

$$2MnO_4^- + Cu_2S + 8H^+ \rightarrow 2Cu^{2+} + SO_4^{2-} + 2Mn^{2+} + 4H_2O$$

Thus, the number of moles of MnO_4^- ion that will be needed to oxidise one mole of Cu_2S completely = 2

45. **(1)**

$$d = M\left(\frac{1}{m} + \frac{\text{molar mass of solute}}{1000}\right)$$

$$d = 11.12\left(\frac{1}{94.12} + \frac{40}{1000}\right) = 0.556 \text{ g mL}^{-1}$$

46. **(4)**

Only Terminal alkynes gives white precipitate with ammoniacal silver nitrate solution.

47. **(4)**

Neutralisation reactions are exothermic in nature.

Acidic strength $\propto \Delta H_{neutralisation}$ (negative value)

Thus, acidic strength order is:

B > D > A > C

48. **(2)**

$$CH_3COOH + NaOH \rightleftharpoons CH_3COONa + H_2O$$

At t = 0 :	10 m mol	5 m mol	0	0
At equil:	5 m mol	0	5 m mol	5 m mol

Thus, the given buffer a is an acidic buffer.

(NaOH is the limiting reagent)

pH of an acidic buffer is given by:

$$pH = pK_a + \log\frac{[Salt]}{[Acid]}$$

$$= 4.74 + \log\frac{5}{5}$$

$$= 4.74 + \log 1$$

$$= 4.74 + 0$$

$$= 4.74$$

[m mol = Volume × Molarity]

49. **(2)**

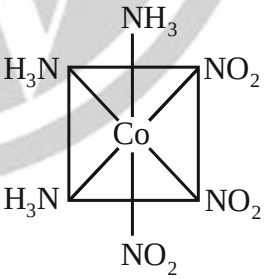
$$w = -2.303nRT\log\frac{V_2}{V_1}$$

$$= -2.303 \times 5 \times 8.314 \times 300 \log\frac{60}{6}$$

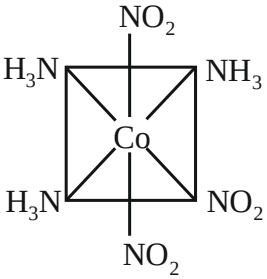
$$= -28.72 \text{ kJ}$$

50. **(1)**

The complex exhibits two geometrical isomers (i) facial and (ii) meridional.



'Facial'



'Meridional'