



Alpha Waves Coaching Centre

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CHEMISTRY FULL PORTION CLASS 11th (04.01.2025)

45x4=180 MARKS

Solution

01. Answer (1)

$$2 \text{ g butane} \rightarrow \text{moles} = \frac{2}{58}$$

$$\text{Number of atoms} = \frac{2}{58} \times N_A \times 14 = 0.48 N_A$$

$$2 \text{ g nitrogen} \rightarrow \text{moles} = \frac{2}{28}$$

$$\text{Number of atoms} = \frac{2}{28} \times N_A \times 2 = 0.14 N_A$$

$$2 \text{ g silver} \rightarrow \text{moles} = \frac{2}{108}$$

$$\text{Number of atoms} = \frac{2}{108} \times N_A = 0.0185 N_A$$

$$2 \text{ g water} \rightarrow \text{moles} = \frac{2}{18}$$

$$\text{Number of atoms} = \frac{2}{18} \times N_A \times 3 = 0.33 N_A$$

02. Answer (4)

03. Answer (4)

m = -1 to +1

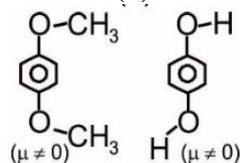
04. Answer (1)

I.E₃ > I.E₂ > I.E₁

05. Answer (4)

In BF₃, B is sp² hybridizedIn PCl₅, P is sp³d hybridizedIn BF₄⁻, B is sp³ hybridizedIn PCl₆⁻, P is sp³d² hybridized

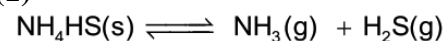
06. Answer (1)



07. Answer (4)

Equilibrium constant depends on temperature.

08. Answer (1)



Initial pressure 0.5 0

Pressure after dissociation (0.5 + P) P

$$K_p = P'_{\text{NH}_3} \times P'_{\text{H}_2\text{S}} = (0.5 + P) P$$

$$0.14 = (0.5 + P) P \Rightarrow P = 0.20$$

$$P'_{\text{NH}_3} = 0.5 + P = 0.5 + 0.20 = 0.70 \text{ atm}$$

$$P'_{\text{H}_2\text{S}} = P = 0.20$$

09. Answer (1)

$$\Delta S = nC_v \ln \frac{T_2}{T_1} + nR \ln \frac{V_2}{V_1}$$

$$= 5 \times (4 - 2) \times 2.303 \log \frac{400}{300} + 5 \times 2 \times 2.303 \times \log \frac{20}{10}$$

$$\Delta S = 2.878 + 6.93 = 9.81 \text{ cal K}^{-1}$$

10. Answer (1)

$$\Delta_r S^0 = \sum n_p S_p^0 - \sum n_R S_R^0$$

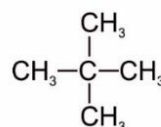
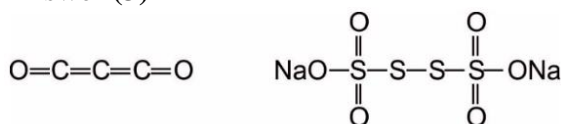
$$= [174.0 + 75] - [2 \times 195 + 213.7]$$

$$= -354.7 \text{ JK}^{-1} \text{ mol}^{-1}$$

11. Answer (2)

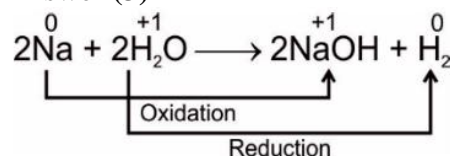
Fact

12. Answer (3)

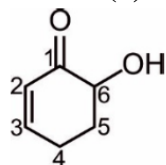


Ca(OCl)Cl

13. Answer (3)



14. Answer (1)



6-Hydroxycyclohex-2-enone

15. Answer (3)

$$\begin{aligned} \text{Meq of excess acid} &= \text{meq of NaOH} \\ &= \frac{1}{5} \times 100 = 20 \end{aligned}$$

$$\text{Total meq of acid} = \frac{1}{5} \times 2 \times 150 = 60$$

$$\begin{aligned} \therefore \text{Meq of H}_2\text{SO}_4 \text{ reacted} &= 60 - 20 = 40 \\ &= \text{meq of NH}_3 \end{aligned}$$

$$\therefore \text{Mole of NH}_3 \times 1 \times 10^3 = 40$$

$$\text{Mole of NH}_3 = 40 \times 10^{-3} = \text{mole of N}$$

$$\text{Mass of N} = 40 \times 10^{-3} \times 14 \text{ g} = 0.56 \text{ g}$$

$$\therefore \% \text{ of N} = \frac{0.56}{0.7} \times 100 = 80\%$$

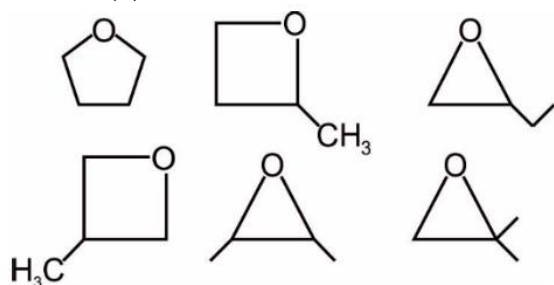
16. Answer (1)

Higher the number of α -H of alkyl group directly attach on benzene, more is its reactivity towards electrophilic substitution reaction.

17. Answer (1)

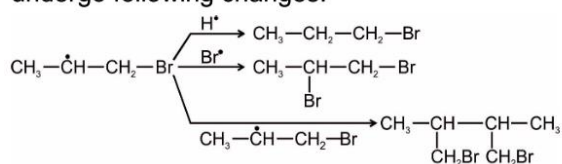
Option (1) is least stable as like charge on adjacent atoms.

18. Answer (4)



19. Answer (4)

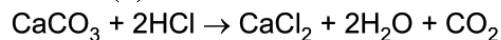
Intermediate formed during anti-Markovnikov addition is $\text{CH}_3-\dot{\text{C}}\text{H}-\text{CH}_2-\text{Br}$ which may undergo following changes.



20. Answer (2)

Stabler the carbonium ion faster is the ease of dehydration.

21. Answer (4)



$$\text{Moles of CaCO}_3 = \text{Moles of CO}_2$$

$$\text{Moles of CaCO}_3 = \frac{448}{22400} = 0.02$$

$$\text{Mass of CaCO}_3 = 0.02 \times 100 \text{ g} = 2 \text{ g}$$

$$\therefore \text{Percentage of CaCO}_3 = \frac{2}{5} \times 100 = 40\%$$

22. Answer (2)

Percentage of weight by volume

$$= \frac{0.6 \times 170}{1000} \times 100$$

$$= 10.2\%$$

23. Answer (1)

$$\text{Density} = 789 \text{ kg/m}^3 = 0.789 \text{ g/cm}^3$$

$$\therefore \text{Molarity} = \frac{789}{46} = 17.15$$

24. Answer (3)

In nuclear reaction law of conservation of mass is not applicable.

25. Answer (3)

$$\text{Since } \Delta E = \frac{hc}{\lambda}$$

\therefore Shortest $\lambda \Rightarrow \Delta E = \text{Maximum} \Rightarrow$ last line

So, for Lyman series, $n_2 = \infty \rightarrow n_1 = 1$

$$\frac{1}{\lambda} = R_H(1)^2 \left(\frac{1}{1^2} - \frac{1}{\infty^2} \right)$$

$$\frac{1}{x} = R_H$$

Also, longest $\lambda \Rightarrow \Delta E = \text{minimum} \Rightarrow$ first line

So, Balmer series $n_2 = 3 \rightarrow n_1 = 2$

$$\frac{1}{\lambda} = R_H(2)^2 \left(\frac{1}{2^2} - \frac{1}{3^2} \right)$$

$$= R_H \times 4 \times \frac{5}{36}$$

$$\lambda = \frac{9}{5R_H} = \frac{9x}{5}$$

26. Answer (4)

In isoelectronic species, as positive charge increases, size decreases and as negative charge increases, size increases.

27. Answer (1)

Graph is for 2s which has 1 radial node ($n - 1 - 1$) i.e., 1 region of low probability density and 2 region of high probability density.

28. Answer (3)

$$\frac{1}{\lambda} = R_H(3)^2 \left[\frac{1}{n_1^2} - \frac{1}{n_2^2} \right] = R_H(1)^2 \left[\frac{1}{2^2} - \frac{1}{3^2} \right]$$

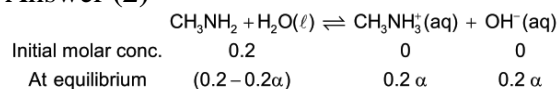
$$\frac{3^2}{n_1^2} = \frac{1}{2^2} \Rightarrow n_1 = 6$$

$$\frac{(3)^2}{n_2^2} = \frac{1}{3^2} \Rightarrow n_2 = 9$$

29. Answer (4)

$$E = -13.6 \frac{Z^2}{n^2} \text{ eV}$$

30. Answer (2)

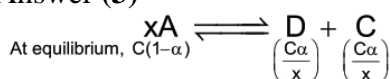


$$[\text{OH}^-] = \sqrt{K_b C} = \sqrt{10^{-5}}$$

$$\text{pOH} = 2.5$$

$$\text{pH} = 14 - 2.5 = 11.5$$

31. Answer (3)



Where, C = initial concentration of A

$$K_c = \frac{C^2 \alpha^2}{x^2 [C(1-\alpha)]^x} = \frac{\alpha^2 \cdot C^{2-x}}{x^2 (1-\alpha)^x}$$

Since K_c is independent of C $\therefore 2 - x = 0$

$$x = 2$$

32. Answer (4)

33. Answer (2)

Relative strength

$$= \frac{\text{Strength of formic acid}}{\text{Strength of acetic acid}} = \sqrt{\frac{K_{a_1}}{K_{a_2}}}$$

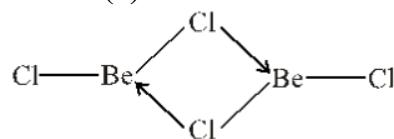
$$= \sqrt{\frac{2.5 \times 10^{-4}}{0.5 \times 10^{-5}}} = \sqrt{50} = 7.07$$

34. Answer (4)

35. Answer (1)

$$\Delta n_g > 0 \text{ then } K_p > K_c$$

36. Answer (3)



3c - 4e⁻ Bond

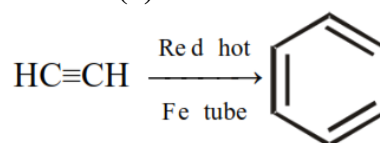
37. Answer (1)

C₄H₉ - has four radicals

38. Answer (2)



39. Answer (1)



40. Answer (2)

for endothermic reaction

on $T \uparrow \Rightarrow$ Reaction goes in forward direction

41. Answer (2)

$$S = \text{Molarity} = \frac{6.9 \times 10^{-2} \times 1000}{690 \times 100} = 10^{-3} \text{ mol/L}$$

$$\text{For } \text{Ba}_3(\text{AsO}_4)_2 \quad K_{sp} = 108 S^5$$

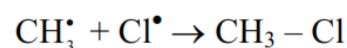
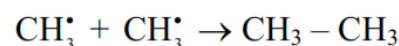
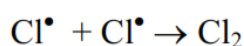
$$K_{sp} = 1.08 \times 10^{-13} \text{ M}^5$$

42. Answer (4)

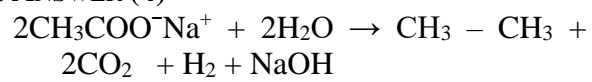
Aniline is purified using steam distillation because aniline is steam volatile & it is insoluble in water.

43. ANSWER (4)

In termination



44. ANSWER (4)



45. ANSWER (3)

