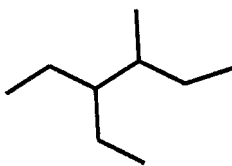


1. The correct set of four quantum numbers for the valence electrons of rubidium atom ($Z = 37$) is
- 1) $5, 0, 0, +\frac{1}{2}$ 2) $5, 1, 0, +\frac{1}{2}$ 3) $5, 1, 1, +\frac{1}{2}$ 4) $5, 0, 1, +\frac{1}{2}$
2. The group having iso electronic species is
- 1) O^-, F^-, Na^+, Mg^{2+} 2) $O^{2-}, F^-, Na^+, Mg^{2+}$
 3) O^-, F^-, Na, Mg^+ 4) O^{2-}, F^-, Na, Mg^{2+}
3. In allene (C_3H_4), the types of hybridization of the carbon atoms is (are)
- 1) sp and sp^3 2) sp^2 and sp 3) only sp^2 4) sp^2 and sp^3
4. Stability of the species Li_2, Li_2^- and Li_2^+ increases in the order of
- 1) $Li_2^- < Li_2^+ < Li_2$ 2) $Li_2 < Li_2^- < Li_2^+$
 3) $Li_2^- < Li_2 < Li_2^+$ 4) $Li_2 < Li_2^+ < Li_2^-$
5. Volume occupied by 4.4 g of CO_2 is
- 1) 2240 lit at STP 2) 2.24 lit at STP 3) 22.4 lit at STP 4) 224 lit at STP
6. Number of atoms in 4.25 g of NH_3 is
- 1) 6.023×10^{23} 2) $4 \times 6.023 \times 10^{23}$ 3) 1.7×10^{24} 4) $4.5 \times 6.023 \times 10^{23}$
7. If the weight of 5.6 litres of a gas at S.T.P is 11 grams, the gas is
- 1) Phosphine 2) Phosgene 3) Nitric oxide 4) Nitrous oxide
8. The commercial name for calcium oxide is
- 1) Quick lime 2) Milk of lime 3) Slaked lime 4) Lime stone
9. In the reaction $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$ the equilibrium concentrations of PCl_5 and PCl_3 are 0.4 and 0.2 mole.lit⁻¹ respectively. If the value of K_c is 0.5, what is the concentration of Cl_2 in moles.lit⁻¹
- 1) 2.0 2) 1.5 3) 1.0 4) 0.5
10. 5L cylinder contains 10 mol of nitrogen at 27°C. If whole of the gas escapes into atmosphere having pressure 1 atm then the work has to be done by the gas is
- 1) -10 KJ 2) -15 KJ 3) -24.413 KJ 4) -50.4 KJ
11. Which of the following is an endothermic reaction?
- 1) $N_{2(g)} + 3 H_{2(g)} - 92 \text{ KJ} \rightarrow 2 NH_{3(g)}$
 2) $N_{2(g)} + O_{2(g)} + 180.8 \text{ KJ} \rightarrow 2 NO_{(g)}$
 3) $H_{2(g)} + Cl_{2(g)} \rightarrow 2 HCl_{(g)} + 184.6 \text{ KJ}$
 4) $C(\text{graphite}) + 2 H_{2(g)} \rightarrow CH_{4(g)} + 74.8 \text{ KJ}$
12. Which one of the following gives Prussian blue colour?
- 1) $Fe_2 [Fe (CN)_6]$ 2) $Na_4 [Fe (CN)_6]$
 3) $Fe_3 [Fe (CN)_6]$ 4) $Fe_4 [Fe (CN)_6]_3$

13. The correct IUPAC name of the following compound is

- 1) 4 - methyl - 3 - ethylhexane
- 2) 3 - ethyl - 4 - methylhexane
- 3) 3, 4 - ethylmethylhexane
- 4) 4 - ethyl - 3 - methylhexane



14. The gas leaked from a storage tank of the union carbide plant in Bhopal gas tragedy was

- 1) Methylamine
- 2) Ammonia
- 3) Phosgene
- 4) Methylisocyanate

15. Ethylene glycol is used as an antifreeze in a cold climate mass of ethylene glycol which should be added to 4 kg of water to prevent it from freezing at -6°C will be (K_f for water = $1.86\text{ K kg mol}^{-1}$ and molar mass of ethylene glycol = 62 g mol^{-1})

- 1) 204.30 g
- 2) 800.00 g
- 3) 304.60 g
- 4) 804.32 g

16. An element having an atomic radius of 0.14 nm crystallizes in an fcc unit cell. What is the length of a side of the cell?

- 1) 0.96 nm
- 2) 0.24 nm
- 3) 0.56 nm
- 4) 0.4 nm

17. What is the rate of reaction for $2\text{A} \rightarrow \text{B}$?

- 1) $-\frac{1}{2} \frac{d[\text{A}]}{dt}$
- 2) $-\frac{d[\text{A}]}{dt}$
- 3) $-\frac{d[\text{B}]}{dt}$
- 4) $\frac{d[\text{A}]}{dt}$

18. The coagulating power of electrolytes having ions Na^+ , Al^{3+} and Ba^{2+} for arsenic sulphide sol increases in the order

- 1) $\text{Na}^+ < \text{Ba}^{2+} < \text{Al}^{3+}$
- 2) $\text{Ba}^+ < \text{Na}^{2+} < \text{Al}^{3+}$
- 3) $\text{Al}^{3+} < \text{Na}^+ < \text{Ba}^{2+}$
- 4) $\text{Al}^{3+} < \text{Ba}^{2+} < \text{Na}^{2+}$

19. One mole of the complex compound $\text{Co}(\text{NH}_3)_5\text{Cl}_3$ gives 3 moles of ions on dissolution in water. One mole of the same complex reacts with two moles of AgNO_3 solution to yield two moles of $\text{AgCl}(\text{s})$. The structure of complex is

- 1) $[\text{Co}(\text{NH}_3)_4\text{Cl}]\text{Cl}_2 \cdot \text{NH}_3$
- 2) $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$
- 3) $[\text{Co}(\text{NH}_3)_3\text{Cl}_5] \cdot 2\text{NH}_3$
- 4) $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{Cl} \cdot \text{NH}_3$

20. $\text{C}_6\text{H}_5\text{CH}_2\text{Cl} + \text{KCN}(\text{aq}) \rightarrow \text{X} + \text{Y}$ compounds X and Y are

- 1) $\text{C}_6\text{H}_6 + \text{KCl}$
- 2) $\text{C}_6\text{H}_6\text{CH}_2\text{CN} + \text{KCl}$
- 3) $\text{C}_6\text{H}_5\text{CH}_3 + \text{KCl}$
- 4) None

21. Primary alcohols are obtained by the reaction of Grignard reagent with

- 1) CH_3COCH_3
- 2) HCOOH
- 3) HCHO
- 4) CH_3CHO

22. $\text{C}_2\text{H}_5\text{OH} + 4\text{I}_2 + 3\text{Na}_2\text{CO}_3 \rightarrow \text{X} + \text{HCOONa} + 5\text{NaCl} + 3\text{CO}_2 + 2\text{H}_2\text{O}$

In the above reaction 'X' is

- 1) Di iodo methane
- 2) Tri iodo methane
- 3) Iodo methane
- 4) Tera iodo methane

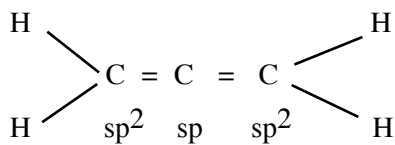
23. Which of the following order is true regarding the acidic nature of phenols?

- 1) Phenol $>$ O - Cresol $>$ O - Nitrophenol
- 2) Phenol $>$ O - Cresol $<$ O - Nitrophenol
- 3) Phenol $<$ O - Cresol $<$ O - Nitrophenol
- 4) Phenol $<$ O - Cresol $>$ O - Nitrophenol

2. $O^{-2}, F^{-}, Na^{+}, Mg^{+2}$

$10e^{-} .10e^{-} 10e^{-} 10e^{-}$

3. The structure of allen is



4. $Li_2(6) = \sigma 1s^2 \sigma^* 1s^2 \sigma 2s^2$

$$B.O = \frac{4 - 2}{2} = 1$$

$Li_2^+(5) = \sigma 1s^2 \sigma 1s^2 \sigma 2s^1$

$$B.O = \frac{3 - 2}{2} = 0.5$$

$Li Li_2^-(7) = \sigma 1s^2 \sigma^* 1s^2 \sigma 2s^2 \sigma^* 2s^1$

$$B.O = \frac{4 - 3}{2} = 0.5$$

Li_2^+ is more stable than Li_2^- because Li_2^- has more number of antibonding electrons.

So $Li_2^- < Li_2^+ < Li_2$

5. 44 gm \rightarrow 22.4 lit

4.4 gm \rightarrow ?

$$\frac{44 \times 22.4}{44} = 2.24 \text{ lit at STP}$$

6. No. of atoms = n \times N \times atomicity

$$n = \frac{4.25}{17} = 0.25 \text{ (NH}_3 = 17 \text{)}$$

$$= 0.25 \times 6.023 \times 10^{23} \times 4$$

$$= 6.023 \times 10^{23}$$

7. 5.6 lit \rightarrow 11 gm

22.4 lit \rightarrow ?

$$\frac{22.4 \times 11}{5.6} = 44 \text{ gm}$$

($N_2O = 44$)

9. $PCl_5 \rightleftharpoons PCl_3 + Cl_2$

$$K_c = \frac{[PCl_3][Cl_2]}{PCl_5}$$

$$0.5 = \frac{0.2 \times [Cl_2]}{0.4}$$

$$[Cl_2] = \frac{0.5 \times 0.4}{0.2} = \frac{0.2}{0.2} = 1$$

10. $PV = nRT$

$$V = \frac{nRT}{P} = 246.3$$

$$dV = 246.3 - 5 = 241.3$$

$$w = -P \times dv$$

$$w = \frac{-1 \times 241.3 \times 101.3}{1000}$$

$$= 24.4 \text{ KJ}$$

$$(1\text{lit} - \text{atm} = 101.325 \text{ J})$$

15. $\Delta T_f = K_f \times m$

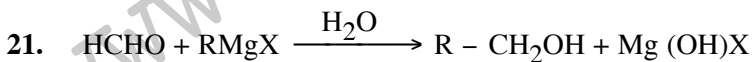
16. For f.c.c. $r = \frac{a}{2} \sqrt{2}$

$$a = r \times 2\sqrt{2}$$

$$= 0.14 \times 2 \times 1.414$$

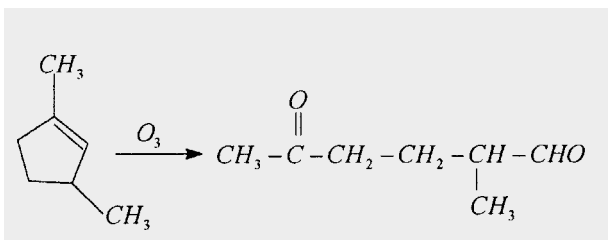
$$= 0.39592 \text{ (or) } 0.4 \text{ nm}$$

19. $CO(NH_3)_5Cl_3$ gives 3 moles of ions but with 2 moles of $AgNO_3$ gives two moles of $AgCl$.

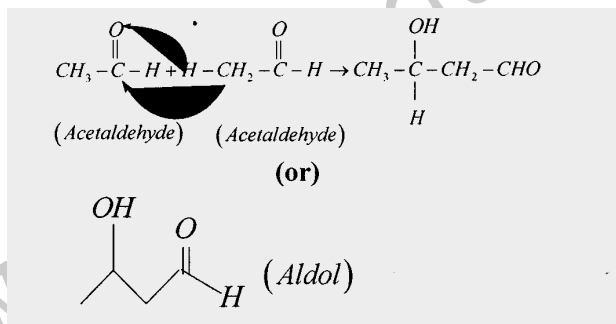


23. Electron withdrawing groups increases acidic nature of phenols whereas electron releasing groups decrease acidic nature.

28.



29. The product of aldol condensation has one alcoholic group and one aldehydes (or) ketonic group. Whether it is a simple aldol condensation (or) crossed aldol condensation



(ఈ సమూహ ప్రశ్నలను శ్రీగాయత్రి విద్యాసంస్థల నిపుణులు రూపొందించారు)