

ANSWER

1. I-D, II-C Or C III-D IV-A
2. V-A, VI-D, VII-B, VIII-C Or A
3. B
4. D or D
5. B
6. D or C
7. A or C
8. D or A
9. A
10. C
11. D
12. D

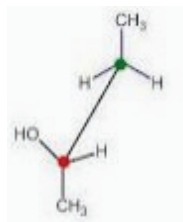
13.C

14.B or A

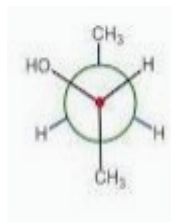
15.B

16.D

17.



a- Sawhorse:



Newman :

b- Ethene decolourise the red liquid Br_2 due to double bond and Ethane does not decolorize Br_2

OR

(a) Kolbe's Electrolytic Process: Sodium salt of carboxylic acid is electrolysed to form hydrocarbon containing even number of carbon atom. Hydrogen gas is released at cathode.

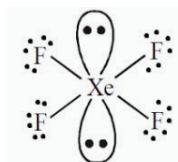
(b) Wurtz Reaction: Alkyl halide on reaction with Na in presence of Dry ether produce hydrocarbon containing double number of carbon atom as are present in parent alkyl halide.

18.(i) Cosmic rays < X-Rays < Amber colour < microwaves < radiation from FM radio. (ii) 1

19.(i)



(a) ClF_3



(b) XeF_4

(ii) Due to zero bond order

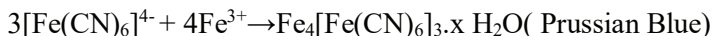
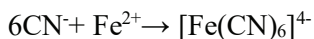
Or

(i) O_2 is paramagnetic as it contains unpaired electron in π^* antibonding molecular orbital.

(ii) Due to hydrogen bonding in H_2O which results large association of water molecules together but in H_2S there is no hydrogen bonding.

20. $\Delta x = [h/(4 \times 3.14)]/\Delta v = 2.11 \times 10^{-14} \text{ cm}$ Or $[1/\lambda] = 109737 [1/n_1^2 - 1/n_2^2]$ $n_1=1, n_2=3,$
 $\lambda = 1.025 \times 10^{-5} \text{ cm}.$

21. $\Delta H = 2 \times (-94.05) + (-68.32) - (-310.62) = 54.20 \text{ kcal}$



24. (A) Hydrogenation of Alkene: When alkene are subjected to react with hydrogen gas in the presence of the catalyst such Ni, then alkane are produced.



B) Dehalogenation Reaction: When vicinal dihalides are treated with zinc metal, lose a molecule of ZnX_2 to form alkene e.g $\text{CH}_2\text{Br}-\text{CH}_2\text{Br} + \text{Zn} \rightarrow \text{CH}_2=\text{CH}_2 + \text{ZnBr}_2$

25. (A) Addition of HCl gas ,cause forward reaction as HCl will react with NH_3 to form white fumes of NH_4Cl and hence according to Le Chatelier principle reactions will move in forward direction.

(B) Addition of NH_3 will result backward direction for the equilibrium reaction as it will result more consumption of the Ammonia gas added at equilibrium.

26. (a) $\text{CaH}_2 < \text{BeH}_2 < \text{TiH}_2$ order of increasing electrical conductance

(b) $\text{LiH} < \text{NaH} < \text{CsH}$ order of increasing ionic character

(c) $\text{H-H} < \text{D-D} < \text{F-F}$ order of increasing bond dissociation enthalpy.

OR

(a) $\text{I} < \text{Br} < \text{Cl} < \text{F}$ order of increasing electronegativity (b) $\text{Al}^{3+} < \text{Mg}^{2+} < \text{Na}^+ < \text{F}^-$ order of increasing ionic size. (c) $\text{B} < \text{Be} < \text{C} < \text{O} < \text{N}$ order of increasing ionization potential.

27. (a) $\text{CH}_2=\text{CH}_2, \text{CH}_3\text{CH}=\text{CH}_2, \text{CH}_3\text{CH}=\text{CHCH}_3$ order of increasing rate of reaction with HBr. (b) $\text{ClCH}_2\text{COOH} < \text{Cl}_2\text{CHCOOH} < \text{Cl}_3\text{CCOOH}$ increasing order of acidic strength

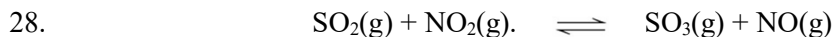
(c) Acetophenone < 1-MethylBenzene < Anisole, increasing rate of Electrophilic Aromatic chlorination substitution reaction.

OR

‘A’ is Hex-3-ene and

‘A’ + $\text{H}_2 \rightarrow \text{Propane}$

‘A’ + $\text{KMnO}_4 + \text{Heat} \rightarrow \text{Propanoic Acid}$



t=0	1	1	1	1
t=t _{eq}	1-x	1-x	1+x	1+x

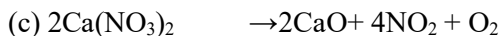
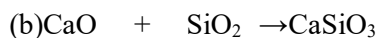
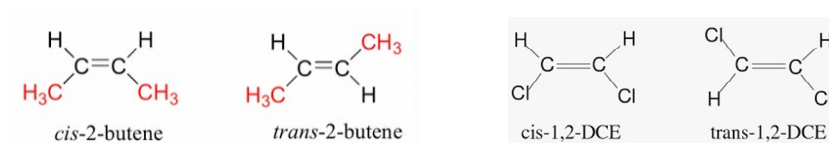
Therefore $K=16 = \frac{[1+x]^2}{[1-x]^2}$

Or $4 = \frac{[1+x]}{[1-x]}$ Therefore $x=0.6$ Hence $[\text{SO}_2] = 1-0.6=0.4$ moles/Litre

29. $\text{CH}_3\text{CH}=\text{CH}_2$, Propene will not show geometrical isomerism

$\text{CH}_3\text{CH}=\text{CHCH}_3$, But-2-ene will show geometrical isomerism

$\text{CHCl}=\text{CHCl}$, 1,2 Dichloroethene will show geometrical isomerism.



31. (a) PCl_5 has sp^3d hybridization. As the axial bond pairs suffer more repulsive interaction from the equatorial bond pairs, therefore axial bonds have been found to be slightly longer and hence slightly weaker than the equatorial bonds, which makes PCl_5 more reactive



OR

(i)-(a) BCl_3 , due to inert pair effect.

(b) As Zn, Cd and Hg do not have partially filled 'd' orbital in their ground state as well as in common oxidation states.

(ii) X-Al, A- $\text{Al}(\text{OH})_3$, B- $\text{Na}[\text{Al}(\text{OH})_4]$, C- AlCl_3 , D- Al_2O_3

32. [A] = $\text{CH}_3\text{CH}=\text{C}(\text{CH}_3)_2$ [B] = $\text{CH}_3\text{CHBr}-\text{CBr}(\text{CH}_3)_2$ [C] = $\text{CH}_3\text{CH}(\text{OH})-\text{C}(\text{OH})(\text{CH}_3)_2$

OR

(i) (a) $(\text{CH}_3)_3\text{C}^+ > (\text{CH}_3)_2\text{HC}^+ > (\text{CH}_3)\text{H}_2\text{C}^+ > \text{CH}_3^+$

(b) Toluene > Benzene > m-Dinitrobenzene

(ii) $\text{CH}_3\text{CH}=\text{CH}_2 + \text{HBr} \rightarrow \text{CH}_3\text{CH}(\text{Br})-\text{CH}_3$ (Major) + $\text{CH}_3\text{CH}_2-\text{CH}_2\text{Br}$ (Minor)

33. (a) Empirical formula is the shortest formula of the compound without considering its bonding aspect. It may or may not be same as Molecular formula of a substance.

(b) Empirical formula : $\text{Na}_2\text{SH}_{20}\text{O}_{14}$, Molecular Formula : $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$

OR

(a) The standard enthalpy change for the formation of one mole of a compound from its element in their most stable states of aggregation.

(b) $2\text{X}_{\text{equ}}(\text{ii}) + 3\text{X}_{\text{equ}}(\text{iii}) - \text{equ}(\text{i})$ give $\Delta H = 2825.77 \text{ kJ}$ for the reaction $\text{C}_2\text{H}_6(\text{g}) \rightarrow 2\text{C}(\text{g}) + 6\text{H}(\text{g})$

Let 'x' is the C-C bond energy then 'x' + 6 BE(C-H) = 2825.77 and hence BE (C-C) = 329.77 kJ