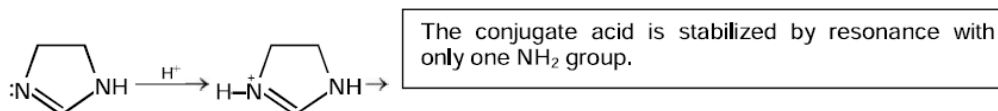
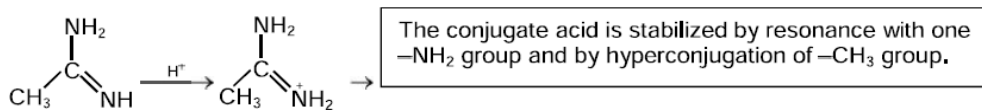
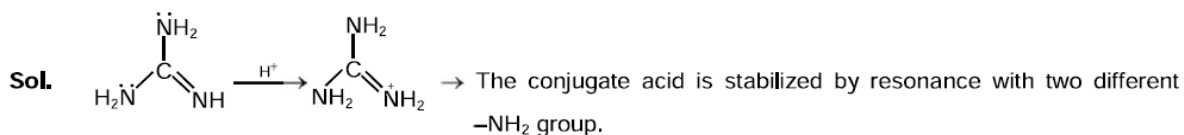


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CHEMISTRY

19. Ans. (D)



(III) Least basic, as the LP is used in aromaticity.

20. Ans. (A)

Sol. As T increases, $V.P$ increases. So C & D option get rejected.

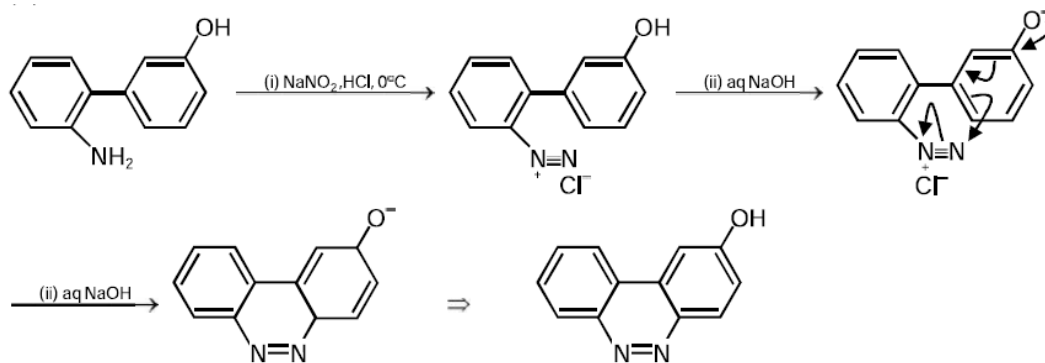
$$\Delta T_f = K_f \times m$$

$$273 - T'_f = 2 \times \frac{34.5/46}{0.5}$$

$$\therefore T'_f = 270 \text{ K}$$

21. Ans. (A)

Sol.



22. Ans. (C)

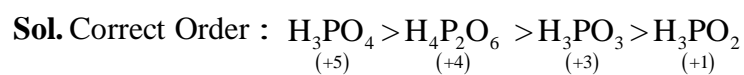
Sol.

$$\Delta G = \Delta G^\circ + 2.303RT \log_{10} Q; Q = \frac{[\text{Zn}^{2+}]}{[\text{Cu}^{2+}]}$$

$$= -2F(1.1) + 2.303RT \log_{10} 10$$

$$= 2.303RT - 2.2F$$

23. Ans. (B)



24. Ans. (C)

Sol.

$$dG = VdP - SdT$$

At 298K, $SdT = 0$

$$\therefore dG = VdP$$

$$\int_1^P dG - \int_1^P VdP \quad \therefore G - G^\circ = V(P-1) \quad [\because \text{Solids involved} \therefore V \text{ Almost Constant }]$$

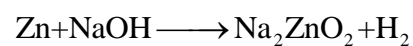
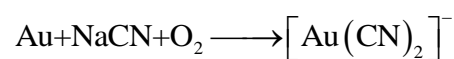
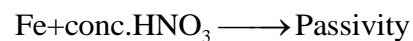
$$\therefore \Delta_r G = [G^\circ_{\text{diamond}} + V_d(P-1)] - [G^\circ_{\text{graphite}} + V_g(P-1)]$$

$$0 = 2.9 \times 10^3 + (P-1)10^5(-2 \times 10^{-6})$$

$$\therefore P = 14501 \text{ bar}$$

25. Ans. (D)

Sol.



26. **Ans. (AB)**

Sol.

$$\Delta S_{\text{Surr}} = \frac{-\Delta H}{T_{\text{Surr}}}$$

For endothermic, if T_{Surr} , increases, ΔS_{Surr} will increase.

For exothermic, if T_{Surr} , increases, ΔS_{Surr} will decrease.

27. **Ans. (AB)**

Sol.

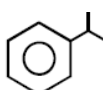
(A) E_a is independent of steric factor

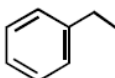
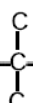
$$(B) P = \frac{K_{\text{actual}}}{K_{\text{theoretical}}}$$

So, $A_{\text{actual}} > A_{\text{theoretical}}$

28. **Ans. (ACD)**

Sol.

(A) Compound  Br, 2° Benzylic may follow both path S_N1 and S_N2 .

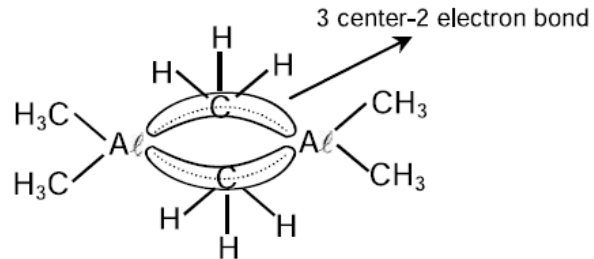
(C) I is  Br (1° benzylic halide) and  Br (3° alkyl halide). Follow S_N1 .

(D) I and II follow S_N2 also, as both are 1° halide.

29. Ans. (ABD)

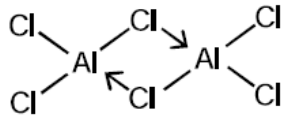
Sol.

Structure of $\text{Al}_2(\text{CH}_3)_6$

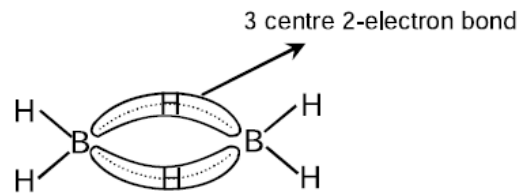


$\Rightarrow \text{BCl}_3$ is stronger Lewis acid due to small size of boron.

\Rightarrow Structure of Al_2Cl_6



\Rightarrow Structure of B_2H_6



30. Ans. (CD)

Sol.

$\text{NO} \Rightarrow$ Neutral

$\text{B}_2\text{O}_3 \Rightarrow$ Acidic

$\text{CrO} \Rightarrow$ Basic

All other oxides are amphoteric

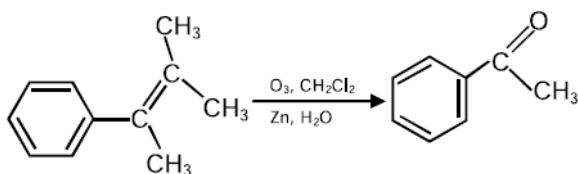
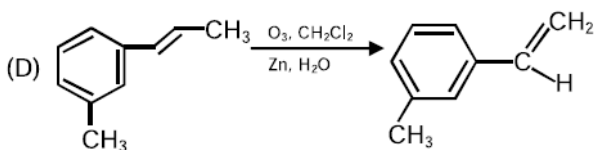
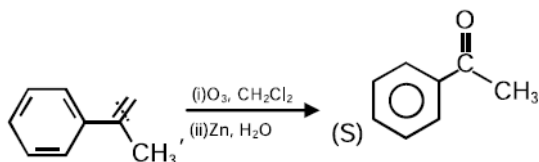
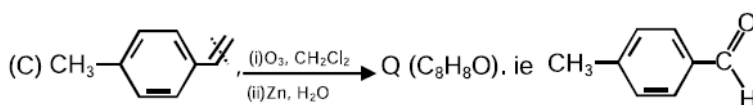
31. Ans. (AC)

Sol.

- Higher the critical temperature, higher will be extent of adsorption.
- Cloud is an aerosol, emulsions are liquid-liquid colloidal system.
- For adsorption $\Delta H \Rightarrow \text{negative}$; $\Delta S \Rightarrow \text{negative}$
- Brownian movement of colloidal particles depends on size of particles.

32. Ans. (CD)

Sol.

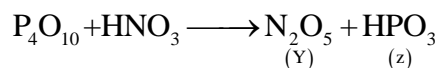
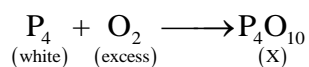
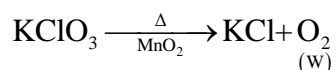


33. Ans. (D)

34. Ans. (A)

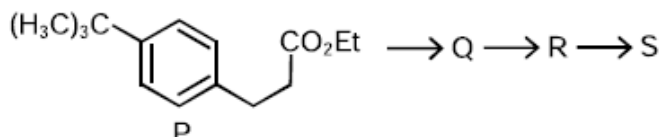
Sol.

(33 & 34)



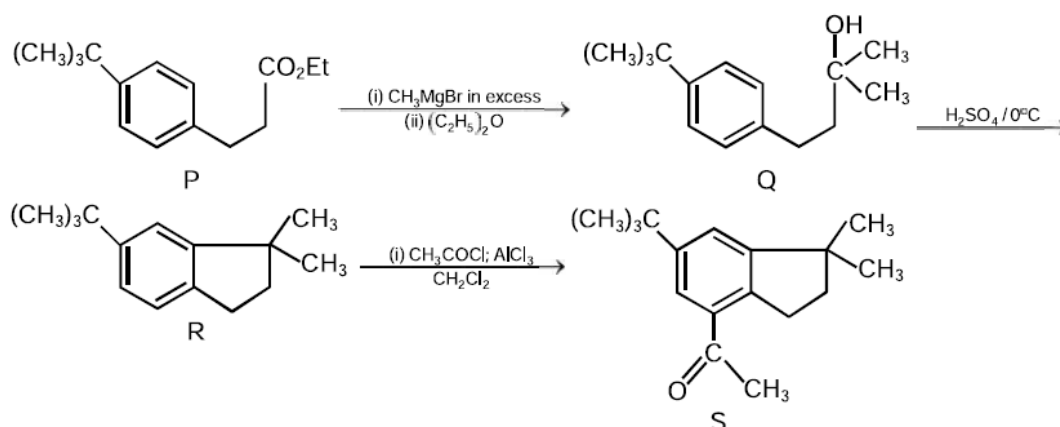
Paragraph 2

The reaction of compound *P* with CH_3MgBr (excess) in $(\text{C}_2\text{H}_5)_2\text{O}$ followed by addition of H_2O gives *Q*. The compound *Q* on treatment with H_2SO_4 at 0°C gives *R*. The reaction of *R* with CH_3COCl in the presence of anhydrous AlCl_3 in CH_2Cl_2 followed by treatment with H_2O produces compound *S*. [Et in compound *P* is ethyl group]



35. **Ans. (B)**

Sol.



36. **Ans. (B)**

Sol.

Process involved in $Q \rightarrow R$ reaction is alkylation

Process involved in $R \rightarrow S$ reaction is acylation.