

SOLUTION OF NEET PHASE-2/ AIPMT - 2016

(HELD ON 24th JULY SUNDAY 2016)

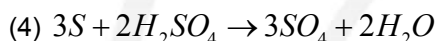
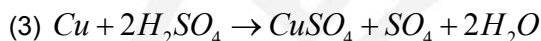
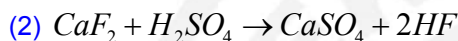
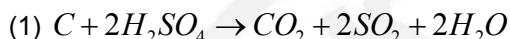
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(All Code - A/P/W, B/Q/X, C/R/Y, D/S/Z)

SOLUTION [CHEMISTRY]

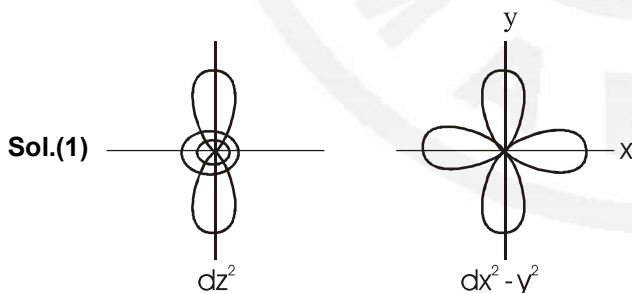
136. Hot concentrated sulphuric acid is a moderately strong oxidizing agent. Which of the following reactions does not show oxidizing behavior ?



Sol.(2) 2nd reaction is not a redox reaction as the oxidation number of elements remains unchanged.

Redox (E)

137. Which of the following pairs of d-orbitals will have electron density along the axis ?



Atomic Structure (M)

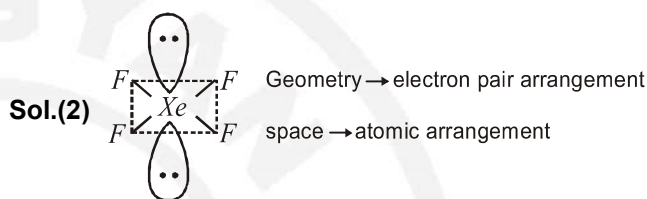
138. The correct geometry and hybridization for XeF_4 are

(1) planar triangle sp^3d^3

(2) square planar, sp^3d^3

(3) octahedral, sp^3d^2

(4) triangle bipyramidal, sp^3d



Chemical Bonding (E)

Geometry → octahedral hybridization → sp^3d^2

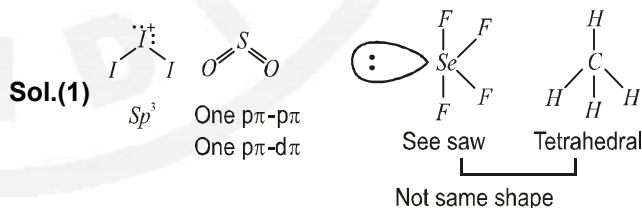
139. Among the following, which one is a wrong statement ?

(1) SeF_4 and CH_4 have same shape

(2) I_3^+ has bent geometry

(3) PH_5 and $BiCl_5$ do not exist

(4) $p\pi - d\pi$ bonds are present in SO_2



Chemical Bonding (M)

140. The correct increasing order of trans-effect of the following species is

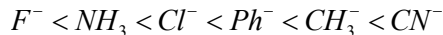
(1) $Br^- > CN^- > NH_3 > C_6H_5^-$

(2) $CN^- > Br^- > C_6H_5^- > NH_3$

(3) $NH_3 > CN^- > Br^- > C_6H_5^-$

(4) $CN^- > C_6H_5^- > Br^- > NH_3$

Sol.(4) Trans effect : The intensity of trans effect depend on increase in rate of substitution of the trans ligand.



Co-ordinate Compound (T)

141. Which one of the following statements related to lanthanons is **incorrect** ?

(1) All the lanthanons are much more reactive than aluminium.

(2) $Ce(+4)$ solutions are widely used as oxidizing agent in volumetric analysis.

(3) Europium shows +2 oxidation state

(4) The basicity decreases as the ionic radius decreases from P_r to Lu .

Sol.(1) Ce^{+4} is strong oxidising agent and easily convert into Ce^{+3}

Eu^{+2} exist and behave as reducing agent lanthanons are much more reactive than aluminium.

Lanthanoids are basic in nature and their acidity is three.

F-block (T)

142. Jahn - Teller effect is not observed in high spin complexes of

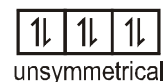
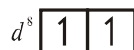
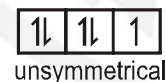
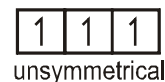
(1) d^4

(2) d^9

(3) d^7

(4) d^8

Sol.(4) Jahn teller effect : this is geometric distortion occur in unsymmetrical octahedral complexes for example high spin complexes of (high spin)



Co-ordination (T)

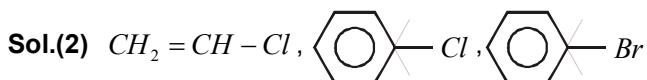
143. Which of the following can be used as the halide component for Friedel- Crafts reactions ?

(1) Chloroethene

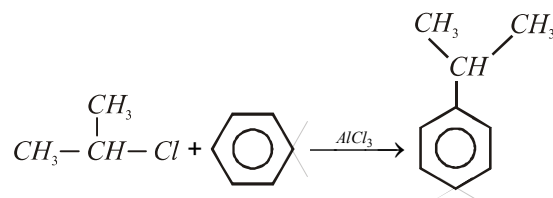
(2) Isopropyl chloride

(3) Chlorobenzene

(4) Bromobenzene

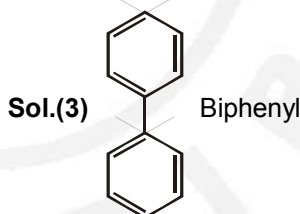
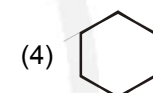
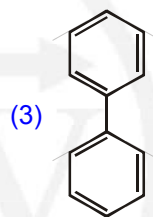
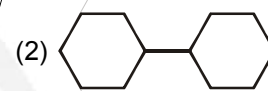
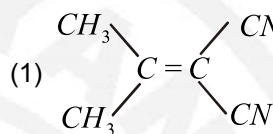


Not suitable for friedal-craft Reaction in Benzene. Isopropyl chloride is suitable.



Aromatic Compound (M)

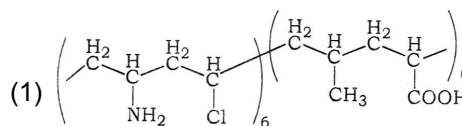
144. In which of the following molecules all atoms are coplanar

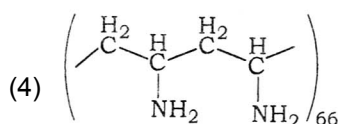
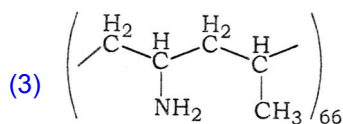
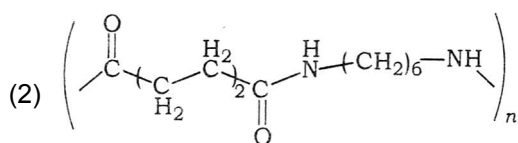


All carbon atom is sp^2 hybridised and its geometry is trigonal planar.

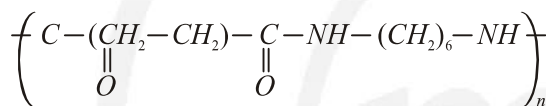
GOC (M)

145. Which one of the following structures represents nylon 6,6 polymer ?



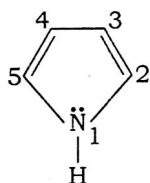


Sol.(3) Nylon-66 \rightarrow adipic acid + Hexamethylene-diamine



Polymer (E)

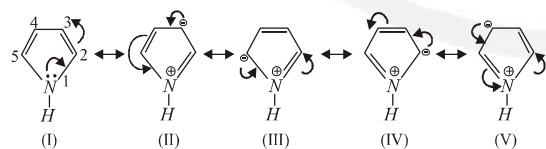
146. In pyrrole



the electron density is maximum on

- (1) 2 and 4 (2) 2 and 5
(3) 2 and 3 (4) 3 and 4

Sol.(2)

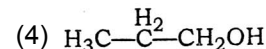
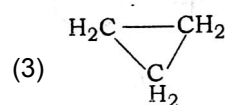


GOC (M)

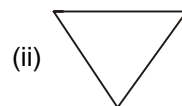
electron density is maximum on-2,5th carbon.

147. Which of the following compounds shall not produce propene by reaction with HBr followed by elimination or direct only elimination reaction?

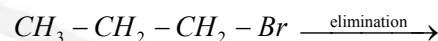
- (1) $\text{H}_2\text{C}=\text{C}=\text{O}$ (2) $\text{H}_3\text{C}-\overset{\text{H}_2}{\text{C}}-\text{CH}_2\text{Br}$



Sol.(1) (i) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{Br} \xrightarrow{\text{elimination}}$



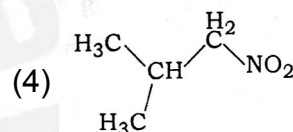
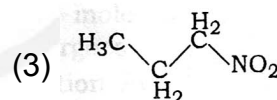
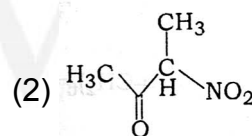
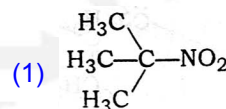
(iii) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{OH} \xrightarrow{\text{HBr}}$



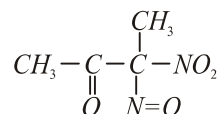
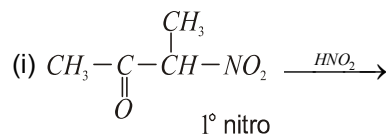
(iv) $\text{CH}_2 = \text{C} = \text{O} \xrightarrow{\text{HBr}} \text{No reaction}$

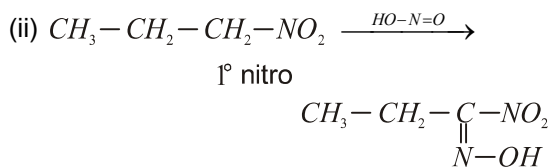
Hydrocarbon (M)

148. Which one of the following nitro-compounds does **not** react with nitrous acid



Sol.(1) 1° nitro compound, 2° nitro compound react with HNO_2 acid but 3° nitro compound does not react with nitrous acid





N-containing (M)

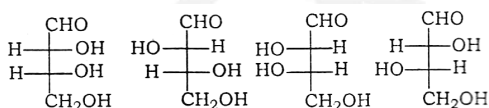
149. The central dogma of molecular genetics states that the genetic information flows from

- (1) DNA \rightarrow RNA \rightarrow Proteins
 (2) DNA \rightarrow RNA \rightarrow Carbohydrates
 (3) Amino acids \rightarrow Proteins \rightarrow DNA
 (4) DNA \rightarrow Carbohydrates \rightarrow Proteins

Sol.(1) DNA - RNA \rightarrow Protein

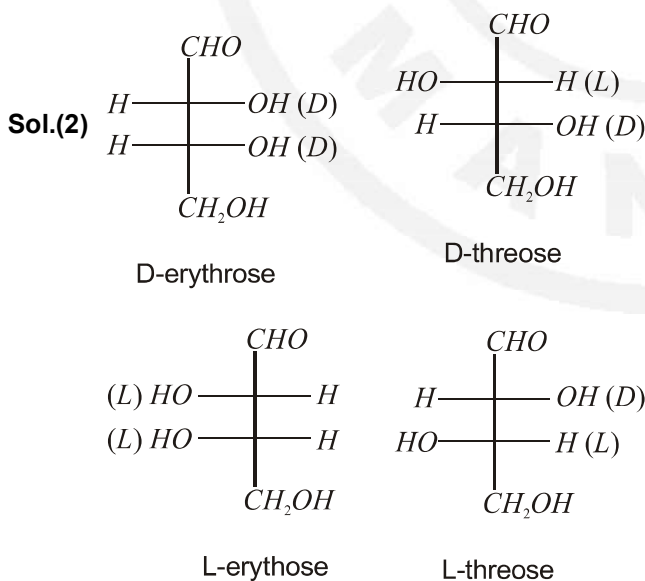
Biomolecule (M)

150. The **correct** corresponding order of names of four aldoses with configuration given below



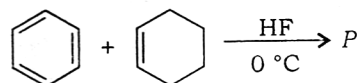
respectively, is

- (1) L-erythrose, L-threose, D-erythrose, D-threose
 (2) D-erythrose, D-threose, L-erythrose, L-threose
 (3) L-erythrose, L-threose, L-erythrose, D-threose
 (4) D-threose, D-erythrose, L-threose, L-erythrose

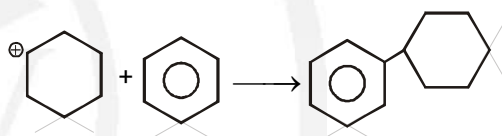
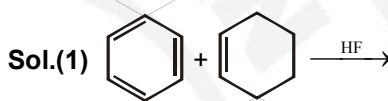
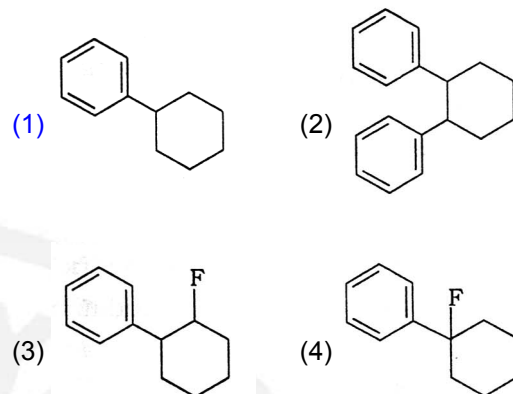


Biomolecule (E)

151. In the given reaction



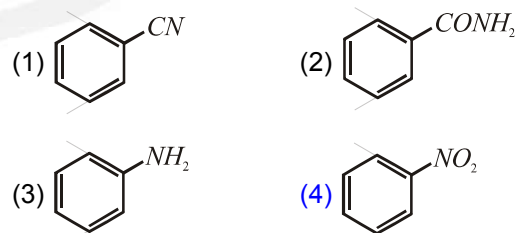
the product P is

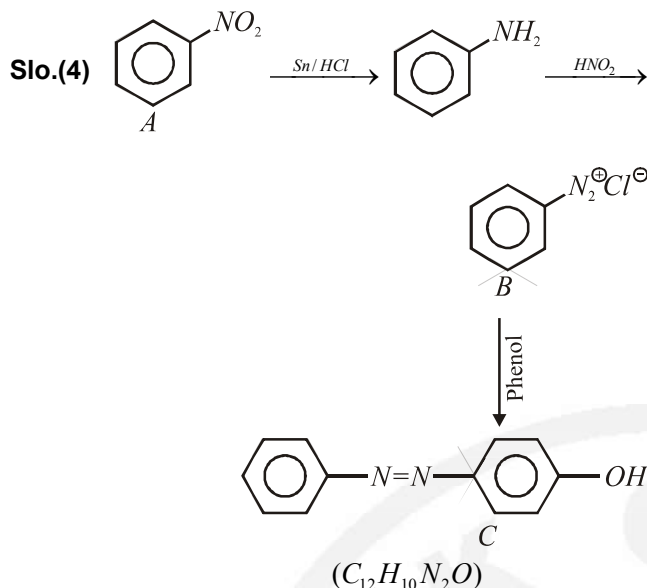


This is a Friedel - Craft reaction.

Aromatic (T)

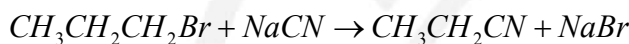
152. A given nitrogen-containing aromatic compound (A) reacts with Sn/HCl , followed by HNO_2 to give an unstable compound (B). (B), on treatment with phenol, forms a beautiful coloured compound (C) with the molecular formula $C_{12}H_{10}N_2O$. The structure of compound (A) is





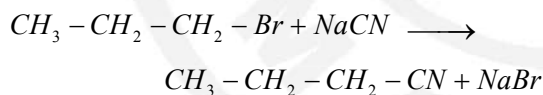
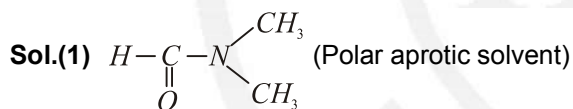
N - containg (M)

153. Consider the reaction



This reaction will be the fastest in

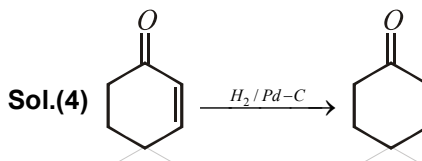
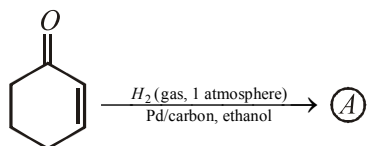
- (1) *N,N'*-dimethylformamide (DMF)
- (2) water
- (3) ethanol
- (4) methanol



This is *S_N2* Reaction for which polar aprotic medium is suitable for faster rate of reaction.

GOC (E)

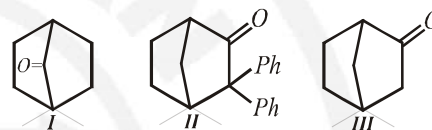
154. The **correct** structure of the product (A) formed in the reaction



During hydrogenation of α, β unsaturated carbonyl compound by *Pd* catalyst selective reduction is observed of double bond.

Alcohol, phenol & ether (T)

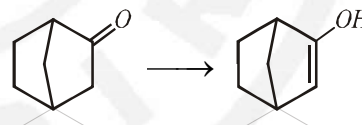
155. Which among the given molecules **can** exhibit tautomerism ?



- (1) Both *I* and *II*
- (2) Both *II* and *III*
- (3) *III* only
- (4) Both *I* and *III*

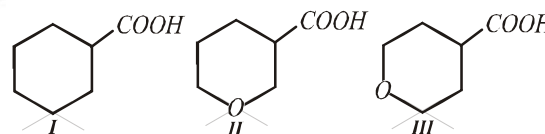
Sol.(3) Only *III*

α -H at bridge head carbon never show tautomerism.



Isomerism (M)

156. The **correct** order of strengths of the carboxylic acids



is :

- (1) *III* > *II* > *I*
- (2) *II* > *I* > *III*
- (3) *I* > *II* > *III*
- (4) *II* > *III* > *I*

Sol.(4) (*II* > *III* > *I*)

Acidic strength \propto (-I), (-M) effect

(-I) effect depend upon distance so II have stronger (-I) effect than III

GOC (M)

157. The compound that will react most readily with gaseous bromine has the formula :

- (1) C_4H_{10} (2) C_2H_4
 (3) C_3H_6 (4) C_2H_2

Sol.(3) At low temperature cyclobromonium ion of propene is highly stable \therefore propene reacts with gaseous bromine.

Hydrocarbon (M)

158. Which one of the following compounds shows the presence of intramolecular hydrogen bond?

- (1) Cellulose
 (2) Concentrated acetic acid
 (3) H_2O_2
 (4) HCN

Sol.(1) Cellulose is example of intramolecular H-bonding

Chemical bonding (M)

159. The molar conductivity of a $0.5 \text{ mol} / \text{dm}^3$ solution of $AgNO_3$ with electrolytic conductivity of $5.76 \times 10^{-3} \text{ S cm}^{-1}$ at 298 K is :

- (1) $0.086 \text{ S cm}^2 / \text{mol}$ (2) $28.8 \text{ S cm}^2 / \text{mol}$
 (3) $2.88 \text{ S cm}^2 / \text{mol}$ (4) $11.52 \text{ S cm}^2 / \text{mol}$

Sol.(4) $\lambda_M^\circ = \frac{\kappa \times 1000}{M} = \frac{5.76 \times 10^{-3} \times 1000}{0.5}$
 $= 11.52 \text{ S cm}^2 \text{ mol}^{-1}$

Electrochemistry (E)

160. The decomposition of phosphine (PH_3) on tungsten at low pressure is a first-order reaction. It is because the :

- (1) rate is independent of the surface coverage
 (2) rate of decomposition is very slow
 (3) rate is proportional to the surface coverage
 (4) rate is inversely proportional to the surface coverage

Sol.(3) $PH_3 \xrightarrow{w} P + \frac{3}{2} H_2$

$$\text{Rate} = k[PH_3]$$

It is independent of the surface coverage because zero order reaction depend on surface area covered by reactant.

Chemical Kinetics (M)

161. The coagulation values in millimoles per litre of the electrolytes used for the coagulation of As_2S_3 are given below :

- I. ($NaCl$) = 52 , II. ($BaCl_2$) = 0.69 ,
 III. ($MgSO_4$) = 0.22

The correct order of their coagulating power is

- (1) III > II > I (2) III > I > II
 (3) I > II > III (4) II > I > III

Sol.(1) Coagulation power $\propto \frac{1}{\text{Coagulation value}}$

Higher the coagulation power, lower is coagulation values in millimoles per litre.



Surface Chemistry (M)

162. During the electrolysis of molten sodium chloride, the time required to produce 0.10 mol of chlorine gas using a current of 3 amperes is :

- (1) 220 minutes (2) 330 minutes
 (3) 55 minutes (4) 110 minutes

Sol.(4) At Cathode : $2H_2O \xrightarrow{2e^-} H_2 + 2OH^\ominus$

At anode : $2Cl^\ominus \xrightarrow{2e^-} Cl_2 + 2e^\ominus$

$$\frac{W}{E} = \frac{It}{96500}$$

$$0.1 \times 2 = \frac{3 \times t(\text{sec})}{96500}$$

$$t = 6433 \text{ sec}$$

$$t = 107.2 \text{ min}$$

$$= 110 \text{ min}$$

Electrochemistry (M)

163. How many electrons can fit in the orbital for which $n = 3$ and $l = 1$?

- (1) 10 (2) 14
 (3) 2 (4) 6

Sol.(3) $n = 3$ $l = 1$
 $3p$ orbital can have only 2 electron.

Atomic Structure (M)

164. For a sample of perfect gas when its pressure is changed isothermally from p_i to p_f , the entropy change is given by :

$$(1) \Delta S = nRT \ln \left(\frac{p_f}{p_i} \right) \quad (2) \Delta S = RT \ln \left(\frac{p_i}{p_f} \right)$$

$$(3) \Delta S = nR \ln \left(\frac{p_f}{p_i} \right) \quad (4) \Delta S = nR \ln \left(\frac{p_i}{p_f} \right)$$

Sol.(4) $\Delta S_{\text{sys}} = nR \ln \frac{P_1}{P_2} + nC_p \ln \frac{T_2}{T_1}$

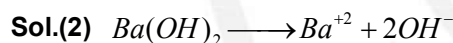
In isothermal process $T_1 = T_2$

$$\Delta S_{\text{sys}} = nR \ln \frac{P_i}{P_f}$$

Thermodynamic Chemistry (M)

165. The van't Hoff factor (i) for a dilute aqueous solution of the strong electrolyte barium hydroxide is :

- (1) 2 (2) 3
 (3) 0 (4) 1

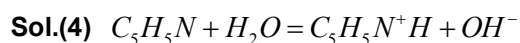


$$i = 3$$

Liquid Solution (E)

166. The percentage of pyridine (C_5H_5N) that forms pyridinium ion ($C_5H_5N^+H$) in a $0.10M$ aqueous pyridine solution (K_b for $C_5H_5N = 1.7 \times 10^{-9}$) is :

- (1) 0.77% (2) 1.6%
 (3) 0.0060% (4) 0.013%



$$0.1$$

$$\alpha = \sqrt{\frac{K_b}{C}} = \sqrt{\frac{1.7 \times 10^{-9}}{0.1}} = \sqrt{1.7 \times 10^{-8}} = 1.3 \times 10^{-4}$$

$$\% \alpha = 1.3 \times 10^{-4} \times 100$$

$$= 1.3 \times 10^{-2} = 0.013$$

Equilibrium (M)

167. In calcium fluoride, having the fluorite structure, the coordination numbers for calcium ion (Ca^{2+}) and fluoride ion (F^\ominus) are :

- (1) 8 and 4 (2) 4 and 8
 (3) 4 and 2 (4) 6 and 6

Sol.(1) Ca^{2+} is surrounded by $8F^\ominus$

F^\ominus is surrounded by $4Ca^{+2}$

Solid State (E)

168. In the E^\ominus_{cell} for a given reaction has a negative value, which of the following gives the correct relationships for the values of ΔG^\ominus and K_{eq} ?

- (1) $\Delta G^\ominus < 0$; $K_{eq} > 1$ (2) $\Delta G^\ominus < 0$; $K_{eq} < 1$
 (3) $\Delta G^\ominus > 0$; $K_{eq} < 1$ (4) $\Delta G^\ominus > 0$; $K_{eq} > 1$

Sol.(3) $E^\ominus_{\text{cell}} < 0$, so it is a non spontaneous process

$$\Delta G^\ominus = -nFE^\ominus = +ve, \text{ so } \Delta G^\ominus > 0$$

$$\Delta G^\ominus = -2.303RT \log K$$

$$\text{So, } K < 1$$

Electro Chemistry (M)

169. Which one of the following is incorrect for ideal solution ?

(1) $\Delta P = P_{\text{obs}} - P_{\text{calculated by Raoult's law}} = 0$

(2) $\Delta G_{\text{mix}} = 0$

(3) $\Delta H_{\text{mix}} = 0$

(4) $\Delta U_{\text{mix}} = 0$

Sol.(2) For ideal solution inter molecular forces are identical so,

$$\Delta H^\ominus_{\text{mix}} = 0, \Delta V_{\text{mix}} = 0, \Delta G_{\text{mix}} < 0$$

So 2nd option is incorrect

Liquid Solution (M)

170. The solubility of $AgCl(s)$ with solubility product 1.6×10^{-10} in $0.1M NaCl$ solution would be :

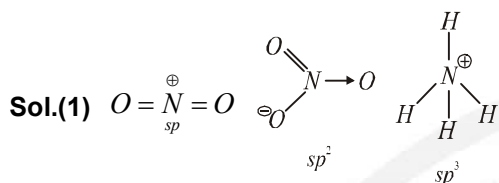
- (1) $1.6 \times 10^{-11} M$ (2) zero
 (3) $1.26 \times 10^{-5} M$ (4) $1.6 \times 10^{-9} M$

Sol.(1) Suspension of slaked lime is called milk of lime

S-block (E)

177. The hybridizations of atomic orbitals of nitrogen in NO_2^+ , NO_3^- and NH_4^+ respectively are :

- (1) sp, sp^2 and sp^3 (2) sp^2, sp and sp^3
(3) sp, sp^3 and sp^2 (4) sp^2, sp^3 and sp

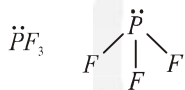


Chemical bonding (E)

178. Which of the following fluoro-compounds is most likely to behave as a Lewis base ?

- (1) CF_4 (2) SiF_4
(3) BF_3 (4) PF_3

Sol.(4) Lewis base \rightarrow $\ell.p$ donor



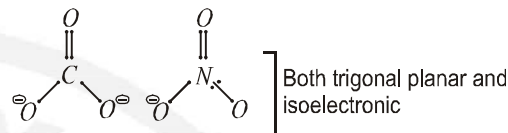
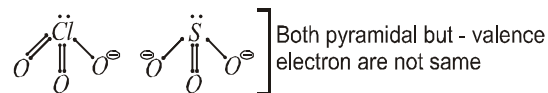
Chemical Bonding (M)

179. Which of the following pairs of ions is

isoelectronic and isostructural ?

- (1) SO_3^{2-}, NO_3^- (2) ClO_3^-, SO_3^{2-}
(3) CO_3^{2-}, NO_3^- (4) ClO_3^-, CO_3^{2-}

Sol.(2&3) iso electronic \rightarrow same valence electron.
iso structural \rightarrow same structure



Chemical Bonding (M)

180. In context with beryllium, which one of the following statements is **incorrect** ?

- (1) Its salts rarely hydrolyze
(2) Its hydride is electron-deficient and polymeric
(3) It is rendered passive by nitric acid
(4) It forms Be_2C

Sol.(1) B_2H_6 boron hydride, it is electron deficient and dimer of BH_3 .

Al, Cr are having passive nature with HNO_3 but Be dissolve in conc. HNO_3

S-block (M)