

JEE-MAIN EXAMINATION – APRIL 2026

(HELD ON WEDNESDAY 08th APRIL 2026)

TIME : 3:00 PM TO 6:00 PM

CHEMISTRY

TEST PAPER WITH SOLUTION

SECTION-A

51. Match List-I with List-II.

List-I	List-II
Mass of substance	Number of atoms
A. 1.8 mg water	I. $2 \times 10^{-4} \times N_A$
B. 9.8 mg sulphuric acid	II. $1.5 \times 10^{-4} \times N_A$
C. 1.8 mg carbon	III. $3 \times 10^{-4} \times N_A$
D. 5.85 mg salt (NaCl)	IV. $7 \times 10^{-4} \times N_A$

Choose the **correct** answer from the options given below :

- (1) A-IV, B-III, C-I, D-II
 (2) A-III, B-II, C-IV, D-I
 (3) A-III, B-IV, C-II, D-I
 (4) A-III, B-IV, C-I, D-II

Ans. (3)

Sol. (A) No. of atoms in 1.8 mg water

$$= \frac{1.8 \times 10^{-3}}{18} \times N_A \times 3 = 3 \times 10^{-4} N_A$$

(B) No. of atoms in 9.8 mg H₂SO₄

$$= \frac{9.8 \times 10^{-3}}{98} \times N_A \times 7 = 7 \times 10^{-4} \times N_A$$

(C) No. of atoms in 1.8 mg carbon

$$= \frac{1.8 \times 10^{-3}}{12} \times N_A = 1.5 \times 10^{-4} \times N_A$$

(D) No. of atoms in 5.85 mg NaCl

$$= \frac{5.85 \times 10^{-3}}{58.5} \times N_A \times 2 = 2 \times 10^{-4} N_A$$

Correct match : A-III, B-IV, C-II, D-I

52. Given below are two statements :

Given : Molar mass of C, H, O, Cl are 12, 1, 16 and 35.5 g mol⁻¹, respectively.

Statement I : In 30%(w/w) solution of methanol in CCl₄ (at T K), the mole fraction of CCl₄ is equal to 0.33.

Statement II : Mixture of methanol and CCl₄ shows positive deviation from Raoult's law.

In the light of the above statements, choose the **correct** answer from the option given below :

- (1) Both **Statement I** and **Statement II** are true
 (2) Both **Statement I** and **Statement II** are false
 (3) **Statement I** is true but **Statement II** are false
 (4) **Statement I** is false but **Statement II** are true

Ans. (1)

Sol. (i) Let wt of solution = 100 g

wt of methanol = 30 g

wt of CCl₄ = 100 – 30 = 70 g

$$\text{mole fraction of CCl}_4 = \frac{n_{\text{CCl}_4}}{n_{\text{CCl}_4} + n_{\text{CH}_3\text{OH}}} = \frac{\frac{70}{154}}{\frac{70}{154} + \frac{30}{32}}$$

$$= 0.3267 \approx 0.33$$

(ii) CCl₄ & methanol is mixture of positive deviation from Raoult's law.

So, statement (I) & statement (II) are correct.

53. Bromine trifluoride autoionizes to form BrF₂⁺ and BrF₄⁻. The shapes of the cation and anion are respectively _____, and _____.

- (1) bent, square planar
 (2) linear, square planar
 (3) bent, see-saw
 (4) linear, tetrahedral

Ans. (1)

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Sol. $\text{BrF}_2^+ \Rightarrow \text{sp}^3$

[Bond pair = 2, lone pair = 2]

$\Rightarrow$ bent

$\text{BrF}_2^+ \Rightarrow \text{sp}^3 \text{d}^2$

[Bond pair = 4, lone pair = 2]

$\Rightarrow$ square planar

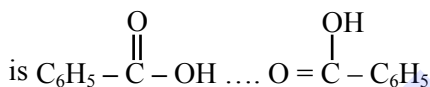
54. Which of the following are **not correct** ?

A. For water, magnitude of K_b is more than the magnitude of K_f .

B. The elevation in boiling point of water when a non-volatile solute is added to it is larger in magnitude than its depression in freezing point.

C. Osmotic pressure measurement is preferred over any other colligative property to determine molar mass of proteins and polymers.

D. The dimerised form of benzoic acid in benzene



Choose the **correct** answer from the options given below :

(1) A and B only

(2) A and D only

(3) A, B and D only

(4) A, C and D only

Ans. (3)

Sol. (A) K_b for water = $0.512 \frac{^\circ\text{C}-\text{Kg}}{\text{mol}}$

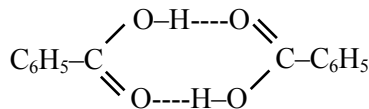
K_f for water = $1.86 \frac{^\circ\text{C}-\text{Kg}}{\text{mol}}$

So, $K_b < K_f$ for water

(B) Since, $K_b < K_f$ so $\Delta T_b < \Delta T_f$ [same equimolal solution]

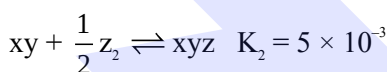
(C) Osmotic pressure is used to determine molar mass of proteins & polymers

(D) dimerised form of benzoic acid in benzene

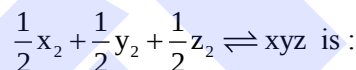


option (A), (B) & (D) are incorrect

55. Consider the following reactions in which all the reactants and products are present in gaseous state



The value of K_3 for the equilibrium



(1) 2.5×10^{-3}

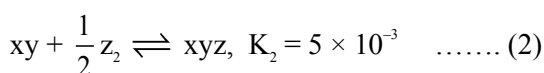
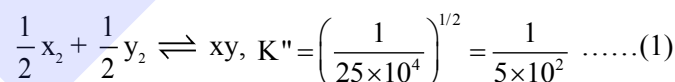
(2) 2.5×10^3

(3) 1.0×10^{-5}

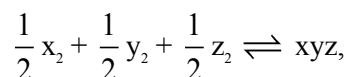
(4) 5×10^{-3}

Ans. (3)

Sol. $x_2 + y_2 \rightleftharpoons 2xy, \quad K' = \frac{1}{K_1} = \frac{1}{2.5 \times 10^5} = \frac{1}{25 \times 10^4}$



On adding equation (1) & (2)



$$K_3 = \frac{1}{5 \times 10^2} \times 5 \times 10^{-3} = 1 \times 10^{-5}$$

56. Given at 298 K : $E_{\text{Fe}^{2+}/\text{Fe}}^\ominus = X \text{ Volt}$

$$E_{\text{Fe}^{3+}/\text{Fe}}^\ominus = Y \text{ Volt}$$

The $E_{\text{Fe}^{3+}/\text{Fe}^{2+}}^\ominus$ in Volt at 298 K is given by :

(1) $2X - 3Y$

(2) $3Y - 2X$

(3) $3Y + 2X$

(4) $Y + X$

Ans. (2)

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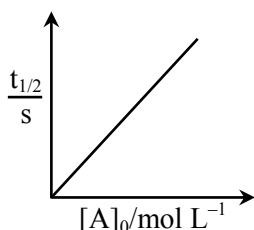
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Sol. (i) $\text{Fe}^{+2}(\text{aq}) + 2\text{e}^- \rightarrow \text{Fe}(\text{s}) \dots\dots \Delta G_1^\circ$
 (ii) $\text{Fe}^{+3}(\text{aq}) + 3\text{e}^- \rightarrow \text{Fe}(\text{s}) \dots\dots \Delta G_2^\circ$
 (iii) $\text{Fe}^{+3}(\text{aq}) + \text{e}^- \rightarrow \text{Fe}^{+2}(\text{aq}) \dots\dots \Delta G_3^\circ$
 iii = ii - i
 $-1 \times F \times E_{\text{Fe}^{3+}/\text{Fe}^{2+}}^\circ = -3 \times F \times y - (-2 \times F \times x)$
 $E_{\text{Fe}^{3+}/\text{Fe}^{2+}}^\circ = 3y - 2x$
 Option (2) is correct

57. Given below are two statements :
 $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$ and $1 \text{ cal} = 4.2 \text{ J}$
Statement I : When $E_a = 12.6 \text{ kcal/mol}$, the room temperature rate constant is doubled by a 10°C increase in temperature (298 K to 308 K)
Statement II : For a first order reaction $A \rightarrow B$,



Here $[A]_0$ is the initial concentration of A and $t_{1/2}$ is half-life of reaction.

In the light of the above statements, choose the **correct** answer from the option given below :

- (1) Both **Statement I** and **Statement II** are true
- (2) Both **Statement I** and **Statement II** are false
- (3) **Statement I** is true but **Statement II** are false
- (4) **Statement I** is false but **Statement II** are true

Ans. (3)

Sol. S-I : $\ln \left(\frac{K_2}{K_1} \right) = \frac{12.6 \times 10^3}{\left(\frac{8.314}{4.2} \right)} \left[\frac{10}{298 \times 308} \right]$

$$\Rightarrow \ln \left(\frac{K_2}{K_1} \right) = 0.693$$

$$\Rightarrow \frac{K_2}{K_1} = 2$$

S-II : For 1^{st} order

$$t_{1/2} = \frac{\ln 2}{K}; t_{1/2} \propto [A]^0 = \text{constant.}$$

Statement-I is true but statement-II is false.

58. Match List-I with List-II.

List-I	List-II
Electronic configuration of neutral atom (where $n = 2$)	1^{st} Ionization Energy (kJ mol^{-1})
A. ns^2	I. 2080
B. ns^2np^1	II. 899
C. ns^2np^3	III. 800
D. ns^2np^6	IV. 1402

Choose the **correct** answer from the options given below :

- (1) A-II, B-III, C-IV, D-I
- (2) A-IV, B-III, C-II, D-I
- (3) A-III, B-II, C-IV, D-I
- (4) A-III, B-II, C-I, D-IV

Ans. (1)

Sol. (A) $2s^2 \Rightarrow \text{Be}$

(B) $2s^2 2p^1 \Rightarrow \text{B}$

(C) $2s^2 2p^3 \Rightarrow \text{N}$

(D) $2s^2 2p^6 \Rightarrow \text{Ne}$

IE order : $\text{B} < \text{Be} < \text{N} < \text{Ne}$

A-II, B-III, C-IV, D-I

59. Find the **correct** statements related to group 15 hydrides.

- A. Reducing nature increases from NH_3 to BiH_3
- B. Tendency to donate lone pair of electrons decreases from NH_3 to BiH_3
- C. The stability of hydrides decreases from NH_3 to BiH_3
- D. HEH bond angle decreases from NH_3 to SbH_3 (E = Elements of group 15)

Choose the **correct** answer from the options given below :

- (1) A and B only
- (2) B and C only
- (3) A, B, C and D
- (4) A, C and D only

Ans. (3)

Sol. (1) Reducing nature : $\text{NH}_3 < \text{PH}_3 < \text{AsH}_3 < \text{SbH}_3 < \text{BiH}_3$

(2) Lone pair definition tendency :



(3) Stability of Hydrides :



(4) HEH bond angle : $\text{NH}_3 > \text{PH}_3 > \text{AsH}_3 > \text{SbH}_3 > \text{BiH}_3$

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60. Given below are two statements :

Statement I : The number of pairs among $[\text{Ti}^{4+}, \text{V}^{2+}]$, $[\text{V}^{2+}, \text{Mn}^{2+}]$, $[\text{Mn}^{2+}, \text{Fe}^{3+}]$ and $[\text{V}^{2+}, \text{Cr}^{2+}]$ in which both ions are coloured is 3.

Statement II : The number pairs among $[\text{La}^{3+}, \text{Yb}^{2+}]$, $[\text{Lu}^{3+}, \text{Ce}^{4+}]$ and $[\text{Ac}^{3+}, \text{Lr}^{3+}]$ ions in which both are diamagnetic is 3.

In the light of the above statements, choose the **correct** answer from the option given below :

- (1) Both **Statement I** and **Statement II** are correct
- (2) Both **Statement I** and **Statement II** are incorrect
- (3) **Statement I** is correct but **Statement II** are incorrect
- (4) **Statement I** is incorrect but **Statement II** are correct

Ans. (1)

Sol. Ti^{4+} is colourless due to d^0 configuration

$\therefore$ statement 1 is correct

La^{+3} , Yb^{+2} , Lu^{+3} , Ce^{+4} , Al^{+3} & Lr^{+3} all are diamagnetic

$\therefore$ Statement 2 is correct.

61. Given below are two statements for catalytic properties of transition metals :

Statement I : First row transition metals which act as catalyst utilise their 3d electrons only for formation of bonds between reactant molecules and atoms on the surface of catalyst.

Statement II : There is increase in the concentration of reactants on the surface of catalyst which strengthens the bonds in reacting molecules.

In the light of the above statements, choose the **correct** answer from the option given below :

- (1) Both **Statement I** and **Statement II** are correct
- (2) Both **Statement I** and **Statement II** are incorrect
- (3) **Statement I** is correct but **Statement II** are incorrect
- (4) **Statement I** is incorrect but **Statement II** are correct

Ans. (2)

Sol. First row transition metals utilize 3d and 4s electrons for bonding on the catalyst surface.

$\therefore$ Statement 1 is incorrect

Adsorption increases reactant concentration on the catalyst surface and weakens bonds facilitating formation of activated complex and lowering activation energy.

$\therefore$ Statement 2 is incorrect

62. Given below are two statements :

Statement I : Vapours of the liquid with higher boiling point condense before vapours of the liquid with lower boiling points in fractional distillation.

Statement II : The vapours rising up in the fractionating column become richer in high boiling component of the mixture.

In the light of the above statements, choose the **correct** answer from the option given below :

- (1) Both **Statement I** and **Statement II** are true
- (2) Both **Statement I** and **Statement II** are false
- (3) **Statement I** is true but **Statement II** are false
- (4) **Statement I** is false but **Statement II** are true

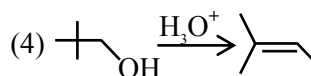
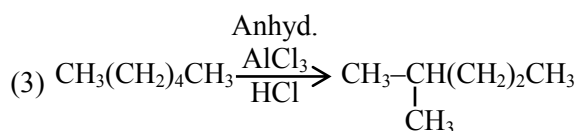
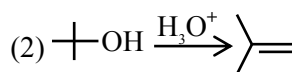
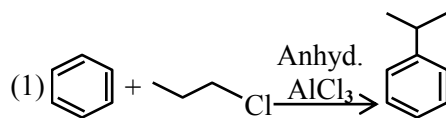
Ans. (3)

Sol. Statement I : True

Statement II : False

Reason - As vapours rise, they become richer in the lower-boiling component, not high-boiling component.

63. The major product of which of the following reaction is not obtained by rearrangement reaction?



Ans. (2)

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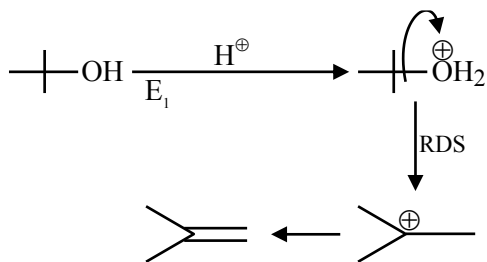
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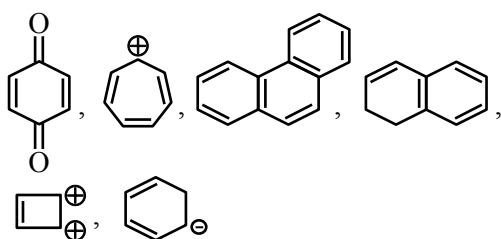
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Product obtained without rearrangement.

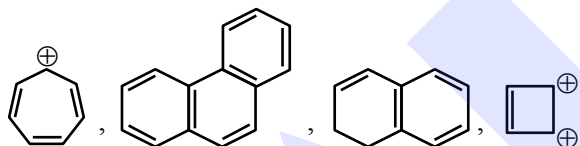
64. The total number of aromatic compounds/species from the following is



- (1) 6 (2) 4
(3) 3 (4) 5

Ans. (2)

Sol. Aromatic compounds are



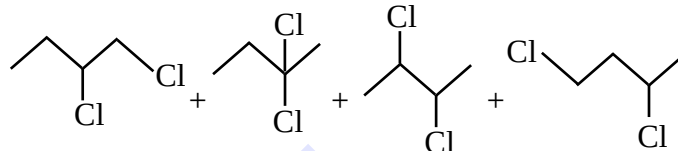
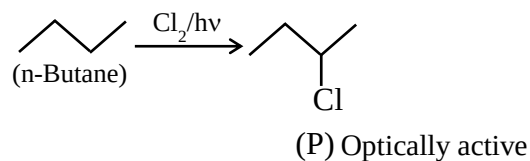
65. n-Butane on monochlorination under photochemical conditions gives an optically active compound "P". "P" on further chlorination gives dichloro compounds.

The number of dichloro compounds obtained (ignore stereoisomers) is :

- (1) 3 (2) 4
(3) 5 (4) 6

Ans. (2)

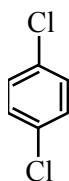
Sol.

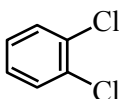


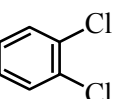
Total dichloro products (excluding stereoisomers) = 4

66. Given below are two statements :

Statement-I : Due to increase in van der Waals forces, the order of boiling points is $\text{CH}_3\text{CH}_2\text{CH}_2\text{I} > \text{CH}_3\text{CH}_2\text{I} > \text{CH}_3\text{I}$.

Statement-II : As  is more symmetric, its

melting point is higher than , however

its boiling point is lower than .

In the light of the above statements, choose the **correct** answer from the options given below :

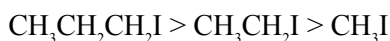
- (1) Both **Statement-I** and **Statement-II** are true.
(2) Both **Statement-I** and **Statement-II** are false.
(3) **Statement-I** is true but **Statement-II** is false.
(4) **Statement-I** is false but **Statement-II** is true.

Ans. (1)



Sol. **Statement 1** : True

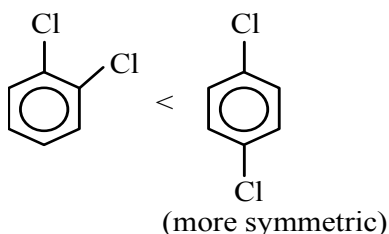
Order of boiling point :



Vanderwaals forces increases due to increase in molecular weight

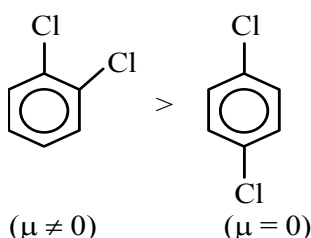
Statement 2: True

Order of melting point :-

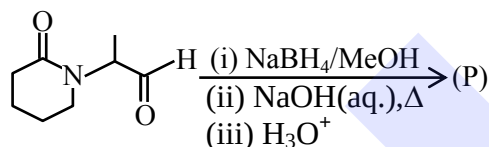


Boiling point order :-

(Boiling point $\propto \mu$)



67. Consider the following reaction.

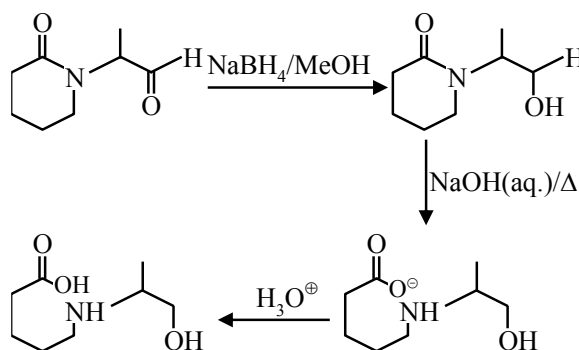


The major product (P) formed is :

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

Ans. (3)

Sol.



68. Which statements are **True**?

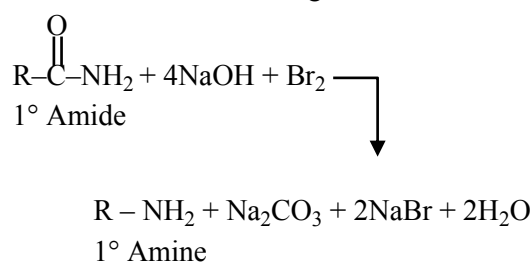
- A. In Hoffmann bromamide degradation, 4 moles of NaOH and 2 moles of Br_2 are consumed per mole of an amide
- B. Hoffmann bromamide reaction is not given by alkyl amides.
- C. Primary amines can be synthesized by Hoffmann bromamide degradation.
- D. Secondary amide on reaction with Br_2 and NaOH will give secondary amine.
- E. The by-products of Hoffmann degradation are Na_2CO_3 , NaBr and H_2O .

Choose the **correct** answer from the options given below :

- (1) A, C and E only (2) B, C and D only
- (3) C and E only (4) C, D and E only

Ans. (3)

Sol. Hoffmann bromamide degradation reaction –



- Statement (A) – False
- Statement (B) – False
- Statement (C) – True
- Statement (D) – False
- Statement (E) – True



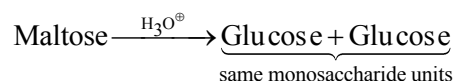
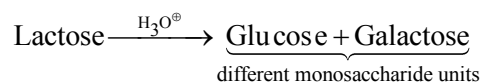
69. The **incorrect** statement from the following with respect to carbohydrates is :

- (1) All monosaccharides are reducing sugars.
- (2) The monosaccharide units obtained from hydrolysis of oligosaccharides are always the same.
- (3) Starch and cellulose are typical examples of polysaccharides, which are very high molecular weight compounds of more than ten monosaccharide units.
- (4) Open chain and cyclic structures co-exist at equilibrium that are responsible for certain properties as in the case of D-(+)-glucose.

Ans. (2)

Sol. The monosaccharide units obtained from hydrolysis of oligosaccharides may be or may not be same.

Example :

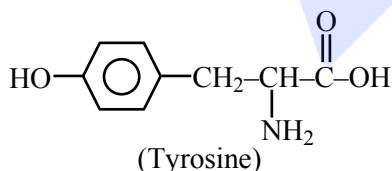


70. Which of the following amino acid will give violet coloured complex with neutral ferric chloride solution?

- (1) Threonine
- (2) Serine
- (3) Tyrosine
- (4) Cysteine

Ans. (3)

Sol.



Tyrosine amino acid will give violet coloured complex with neutral FeCl_3 solution because it contains phenolic group.

SECTION-B

71. Number of paramagnetic complexes among the following is _____.
 $[\text{MnBr}_4]^{2-}$, $[\text{NiCl}_4]^{2-}$, $[\text{Ni}(\text{CN})_4]^{2-}$, $[\text{Ni}(\text{CO})_4]$,
 $[\text{CoF}_6]^{3-}$, $[\text{Fe}(\text{CN})_6]^{4-}$, $[\text{Mn}(\text{CN})_6]^{3-}$, $[\text{Ti}(\text{CN})_6]^{3-}$,
 $[\text{Cu}(\text{H}_2\text{O})_6]^{2+}$, $[\text{Co}(\text{C}_2\text{O}_4)_3]^{3-}$

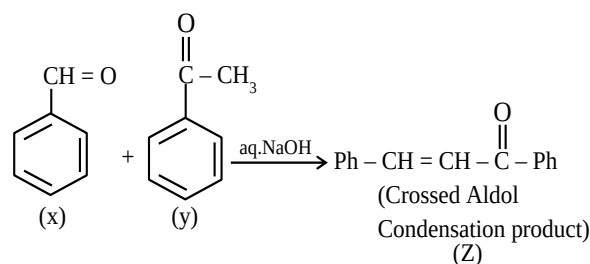
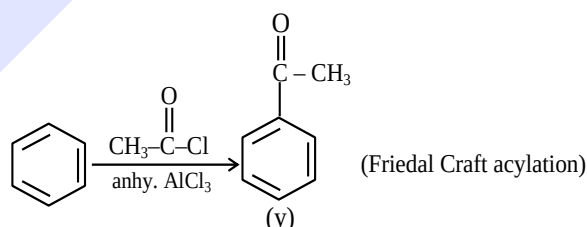
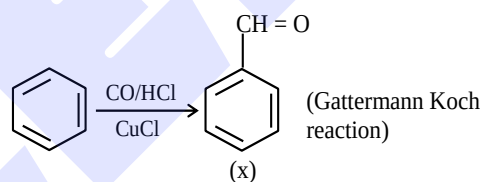
Ans. (6)

Sol. $[\text{MnBr}_4]^{2-}$, $[\text{NiCl}_4]^{2-}$, $[\text{CoF}_6]^{3-}$, $[\text{Mn}(\text{CN})_6]^{3-}$, $[\text{Ti}(\text{CN})_6]^{3-}$, $[\text{Cu}(\text{H}_2\text{O})_6]^{2+}$ are paramagnetic.

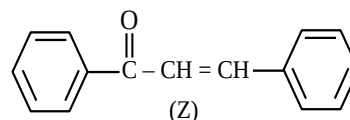
72. 'x' is the product which is obtained from benzene by reacting it with carbon monoxide and hydrogen chloride in the presence of cuprous chloride. 'y' is the major product obtained from the benzene by reacting it with ethanoyl chloride in the presence of anhydrous AlCl_3 . Product (major) obtained by heating x and y in the presence of alkali is z. Total number of π (pi) electrons in z is _____.

Ans. (16)

Sol.



Total number of π (π) electrons in 'z' = 16 π electrons



73. Consider two radiations of wavelengths :

$$1. \lambda_1 = 2000\text{\AA}$$

$$2. \lambda_2 = 6000\text{\AA}$$

The ratio of the energies of these two radiations

$$\left(\frac{E_1}{E_2}\right) \text{ is } \underline{\hspace{2cm}}. \text{ (Nearest integer)}$$

Ans. (3)

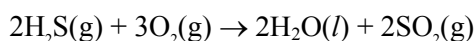
Sol. $E_{\text{photon}} = \frac{hc}{\lambda}$

$$\Rightarrow \frac{E_1}{E_2} = \frac{\lambda_2}{\lambda_1}$$

$$\Rightarrow \frac{E_1}{E_2} = \frac{6000}{2000}$$

$$\Rightarrow \frac{E_1}{E_2} = 3$$

74. Consider the reaction :



The magnitude of enthalpy change for the reaction in kJ mol^{-1} is _____. (Nearest integer)

$$\text{Given : } \Delta_f H^\ominus (\text{H}_2\text{S}) = -20.1 \text{ kJ mol}^{-1}$$

$$\Delta_f H^\ominus (\text{H}_2\text{O}) = -286.0 \text{ kJ mol}^{-1}$$

$$\Delta_f H^\ominus (\text{SO}_2) = -297.0 \text{ kJ mol}^{-1}$$

Ans. (1126)

Sol. $\Delta_r H^\ominus = \Sigma \Delta_f H^\ominus (\text{product}) - \Sigma \Delta_f H^\ominus (\text{Reactant})$

$$\Delta_r H^\ominus = 2 \times \Delta_f H^\ominus (\text{SO}_2, \text{g}) + 2 \times \Delta_f H^\ominus (\text{H}_2\text{O}, \text{l})$$

$$- 2 \times \Delta_f H^\ominus (\text{H}_2\text{S}, \text{g})$$

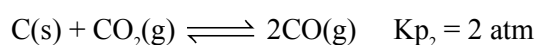
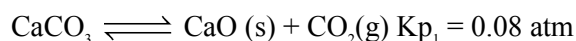
$$\Delta_r H^\ominus = 2 \times (-297) + 2 \times (-286) - 2(-20.1)$$

$$= -594 - 572 + 40.2$$

$$\Delta_r H^\ominus = -1125.8 \text{ kJ/mol.}$$

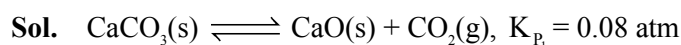
$$|\Delta_r H^\ominus| = 1125.8 \text{ kJ/mol.}$$

75. Solid carbon, CaO and CaCO_3 are mixed and allowed to attain equilibrium at T K.



The partial pressure of CO is _____ $\times 10^{-1}$ atm.

Ans. (4)



$$K_{p_1} = P_{\text{CO}_2} = 0.08 \text{ atm}$$



$$K_{p_2} = \frac{P_{\text{CO}}^2}{P_{\text{CO}_2}} = 2$$

$$\frac{P_{\text{CO}}^2}{0.08} = 2$$

$$P_{\text{CO}}^2 = 16 \times 10^{-2}$$

$$P_{\text{CO}} = 4 \times 10^{-1}$$



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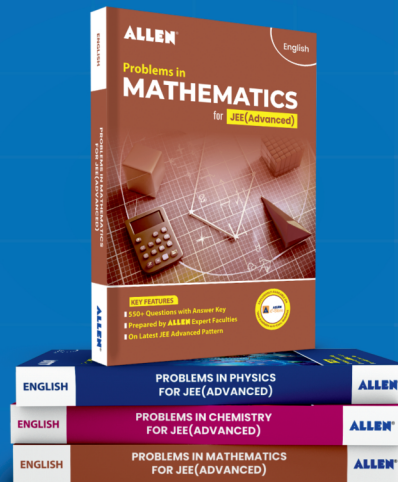
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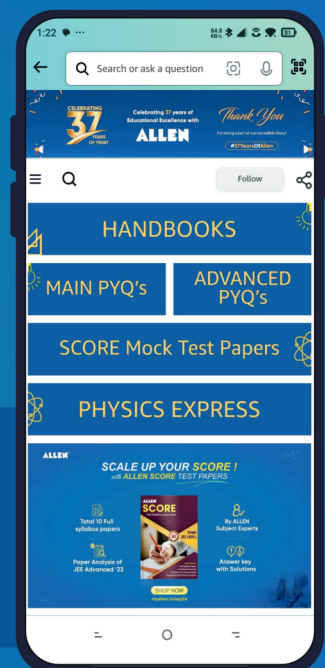
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