

JEE Main April 2026
Question Paper With Text Solution
05 April | Shift -2

CHEMISTRY



JEE Main & Advanced | XI-XII Foundation | VI-X Pre-Foundation

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Question Id : 691121503

53. The covalent radii of atoms A and B are r_A and r_B , respectively. The covalent bond length and total length of AB molecules are respectively.

¶

(1) $(r_A + r_B), 2(r_A + r_B)$

(2) $\frac{1}{2}(r_A + r_B), (r_A + r_B)$

(3) $(r_A + r_B), (r_A + r_B)$

(4) $2(r_A + r_B), \frac{1}{2}(r_A + r_B)$

Ans. (1)

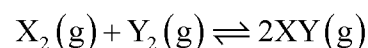
Sol. For AB molecule

$$\text{Bond length} = r_A + r_B$$

$$\text{Total length} = 2(r_A + r_B)$$

Question Id : 691121504

54. Consider the following data for the reaction



at 600 K. The $\Delta_r G^\ominus$ (in kJ mol^{-1}) for the reaction is :

Compound	$\Delta_r H^\ominus_{600\text{K}}$ (kJ mol^{-1})	$S^\ominus_{600\text{K}}$ ($\text{J mol}^{-1} \text{K}^{-1}$)
XY (g)	42	200
$X_2(g)$	8	140
$Y_2(g)$	80	250

¶

(1) -21000

(2) -10

(3) -1000

(4) -9.012

Ans. (2)

Sol. $X_2(g) + Y_2(g) \rightleftharpoons 2XY(g)$

$$\Delta_r H = [2 \times (42)] - [80 - 18] = -4 \text{ kJ mol}^{-1}$$

$$\Delta_r S = [2 \times 200] - [140 + 250] = 10 \text{ JK}^{-1} \text{ mol}^{-1}$$

$$\Delta_r S = \Delta_r H - T \Delta_r S$$

$$= -4000 - 600(10)$$

$$= -10000 \text{ J mol}^{-1}$$

$$= -10 \text{ kJ mol}^{-1}$$

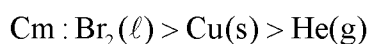
Question Id : 691121505

55. The correct order of molar heat capacities measured at 298K and 1 bar is :

¶

- (1) Copper(s) > Bromine(l) > Helium(g)
- (2) Bromine(l) > Copper(s) > Helium(g)
- (3) Helium(g) > Bromine(l) > Copper(s)
- (4) Helium(g) > Bromine(l) = Copper(s)

Ans. (2)

Sol. Generally, molar heat capacity of liquids is greater than solids because liquids have greater DOF and thus can store more energy with lesser temperature rise. Also, for monoatomic gases, C_m is low as only translational DOF is present.


Question Id : 691121506

 56. The reaction $A(g) \rightleftharpoons B(g) + C(g)$ was initiated with the amount 'a' of A(g). At equilibrium it is found that the amount of A(g) remaining is (a-x) at a total pressure of p.

 The equilibrium constant K_p of the reaction can be calculated from the expression :

¶

- (1) $\frac{x^2}{a^2 + x^2} \times p$
- (2) $\frac{x^2}{a^2 - x^2} \times p$
- (3) $\frac{a + x^2}{x^2} \times p$
- (4) $\frac{a^2 - x^2}{x^2} \times p$

Ans. (2)

Sol. $A(g) \rightleftharpoons B(g) + C(g)$

t=0 a

 t=teq a-x x x $\sum n_{eq} = a + x$

 p.p. $\frac{a-x}{a+x} \cdot p$ $\frac{x}{a+x} \cdot p$ $\frac{x}{a+x} \cdot p$

$$K_p = \frac{\frac{x^2}{(a+x)^2} p^2}{\frac{a-x}{a+x} p} = \frac{x^2}{a^2 - x^2} \cdot p$$

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Question Id : 691121507

57. One half cell in a voltaic cell is constructed by dipping silver rod in AgNO_3 solution of unknown concentration, other half cell is Zn rod dipped in 1 molar solution of ZnSO_4 .

A voltage of 1.60 V is measured at 298 K for this cell. What is the concentration of Ag^+ ions used in terms of log x ($x = [\text{Ag}^+]$) ?

$$E_{\text{Zn}^{2+}/\text{Zn}}^\ominus = -0.76\text{V}, E_{\text{Ag}^+/\text{Ag}}^\ominus = +0.80\text{V}, \frac{2.303RT}{F} = 0.059\text{V}$$

¶

(1) $\frac{2}{3.9}$

(2) $\frac{4}{5.9}$

(3) $\frac{2.9}{2}$

(4) $\frac{5.9}{4}$

Ans. (2)

Sol. $\text{Zn(s)} + 2\text{Ag}^+(\text{aq}) \rightarrow \text{Zn}^{+2}(\text{aq}) + 2\text{Ag(s)}$

$$E_{\text{cell}} = E_{\text{cell}}^\ominus - \frac{0.059}{2} \log \frac{[\text{Zn}^{+2}]}{[\text{Ag}^+]^2}$$

$$1.6 = [0.8 - (-0.76)] - \frac{0.059}{2} \log \frac{1}{(\text{Ag}^+)^2}$$

$$\Rightarrow 0.04 = 0.059 \log [\text{Ag}^+]$$

$$\Rightarrow \log [\text{Ag}^+] = \frac{0.04}{0.059} = \frac{4}{5.9}$$

Question Id : 691121508

58. Given below are two statements :

Statement I : The number of pairs among $[\text{Al}_2\text{O}_3, \text{Cr}_2\text{O}_3]$, $[\text{Cl}_2\text{O}_7, \text{Mn}_2\text{O}_7]$, $[\text{Na}_2\text{O}, \text{V}_2\text{O}_3]$ and $[\text{CO}, \text{N}_2\text{O}]$ that contain oxides of same nature (acidic, basic, neutral or amphoteric) is 4.

Statement II : Among Na_2O , Al_2O_3 , CO and Cl_2O_7 , the most basic and acidic oxides are Na_2O and Cl_2O_7 , respectively.

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.	Oxides	Nature
	[Al ₂ O ₃ , Cr ₂ O ₃]	– Amphoteric
	[Cl ₂ O ₇ , Mn ₂ O ₇]	– Acidic
	[Na ₂ O, V ₂ O ₃]	– Basic
	[CO, N ₂ O]	– Neutral
	Most basic oxide = Na ₂ O	
	Most acidic oxide = Cl ₂ O ₇	

Question Id : 691121509

59. Given below are two statements :

Statement I : Aluminium upon reaction with NaOH forms [Al(OH)₆]³⁻ ion.

Statement II : The geometry of ICl₄⁻, ClO₃⁻ and IBr₂⁻ is square planar, pyramidal and linear respectively.

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. (4)


species	geometry/shape
---------	----------------

ICl ₄ ⁻	square planar
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ClO ₃ ⁻	pyramidal
-------------------------------	-----------

IBr ₂ ⁻	linear
-------------------------------	--------

Question Id : 691121510

60. Given below are two statements :

Statement I : Presence of large number of unpaired electrons in transition metal atoms results in higher enthalpies of their atomisation.

Statement II : $d_{xy} = d_{xz} = d_{yz} < d_{x^2-y^2} = d_{z^2}$ and $d_{x^2-y^2} = d_{z^2} < d_{xy} = d_{xz} = d_{yz}$ are the d-orbital splittings in [Fe(H₂O)₆]³⁺ and [Ni(Cl)₄]²⁻ complex ions respectively.

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

¶

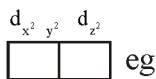
- (1) Both Statement I and Statement II are correct.
- (2) Both Statement I and Statement II are incorrect.

(3) Statement I is correct but Statement II is incorrect.

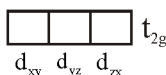
(4) Statement I is incorrect but Statement II is correct.

Ans. (1)

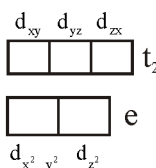
Sol. S-I No of unpaired $e^- \uparrow \Rightarrow$ strength of metallic bonding $\uparrow \Rightarrow \Delta_a H \uparrow$



S-II $[\text{Fe}(\text{H}_2\text{O})_6]^{+3}$ –octahedral



$[\text{NiCl}_4]^{2-}$ –Tetrahedral



Question Id : 691121511

61. Identify the correct statements from the following :

- $[\text{Fe}(\text{C}_2\text{O}_4)_3]^{3-}$ is the most stable complex among $[\text{Fe}(\text{OH})_6]^{3-}$, $[\text{Fe}(\text{C}_2\text{O}_4)_3]^{3-}$ and $[\text{Fe}(\text{SCN})_6]^{3-}$.
- The stability of $[\text{Cu}(\text{NH}_3)_4]^{2+}$ is greater than that of $[\text{Cu}(\text{en})_2]^{2+}$.
- The hybridization of Fe in $\text{K}_4[\text{Fe}(\text{CN})_6]$ is d^2sp^3 .
- $[\text{Fe}(\text{NO}_2)_3\text{Cl}_3]^{3-}$ exhibits linkage isomerism.
- NO_2^- and SCN^- ligands are NOT ambidentate ligands.

Choose the correct answer from the options given below :

¶

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

Ans. (3)

Sol. (A) Since $\text{C}_2\text{O}_4^{2-} \rightarrow$ chelating ligand so, $[\text{Fe}(\text{C}_2\text{O}_4)_3]^{3-} \rightarrow$ most stable

(B) Stability : $[\text{Cu}(\text{en})_2]^{+2} > [\text{Cu}(\text{NH}_3)_4]^{+2}$

(C) $\text{K}_4[\text{Fe}(\text{CN})_6] - d^2sp^3$ (octahedral)

(D) Since NO_2^- ambidentate ligand so, exhibits linkage isomerism.

(E) NO_2^- ; $\text{SCN}^- \rightarrow$ ambidentate ligand

Question Id : 691121512

62. Match List-I with List-II.

List-I

Purification technique

- Simple distillation
- Fractional distillation

List-II

Used to separate

- Steam volatile compound
- Two liquids with large difference in boiling points

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C. Steam distillation

III. Liquid decomposing at its boiling point so, exhibits linkage isomerism

D. Distillation under reduced pressure

IV. Two liquids with close boiling points

Choose the correct answer from the options given below :

¶

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

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

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

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

Ans. (2)

- Sol.** A. Simple distillation used to separate two liquids with large difference in boiling points
 B. Fractional distillation is used to separate two liquids with close boiling points
 C. Steam distillation is used to separate steam volatile compound
 D. Distillation under reduced pressure is used to separate liquid decomposing at its boiling point so, exhibits linkage isomerism

Question Id : 691121513

63. IUPAC name of the some alkenes are given below :

Find out the correct stability order.

A. 2-Methylbut-2-ene

B. cis-But-2-ene

C. 2,3-Dimethylbut-2-ene

D. Prop-1-ene

Choose the correct answer from the options given below :

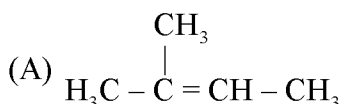
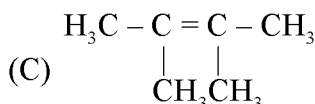
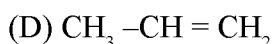
¶

(1) C > A > B > D

(2) C > A > D > B

(3) B > D > A > C

(4) A > B > C > D

Ans. (1)**Sol.** molecules α -Hydrogen9 α 6 α 12 α 3 α more α -H \Rightarrow more H.C effect \Rightarrow more stability**MATRIX JEE ACADEMY**

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S.O. $\Rightarrow C > A > B > D$

Question Id : 691121514

64. Identify the correct IUPAC name of hydrocarbon (x) containing three primary carbon atoms and with molar mass 72 g mol^{-1} .

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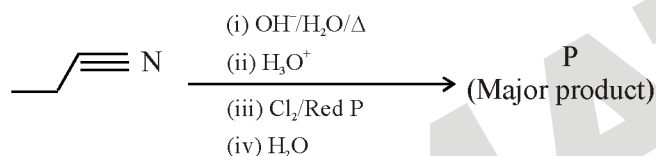
- (1) 1,1-Dimethylcyclopropane (2) 2,2-Dimethylpropane
 (3) 2-Methylbutane (4) n-pentane

Ans. (3)

Sol. 2-methylbutane \Rightarrow $\overset{1^\circ}{\text{CH}_3} - \overset{3^\circ}{\underset{\underset{\text{CH}_3}{|}}{\text{C}}} - \overset{2^\circ}{\text{CH}_2} - \overset{1^\circ}{\text{CH}_3}$ [M.wt = 72 g mol^{-1}]

Question Id : 691121515

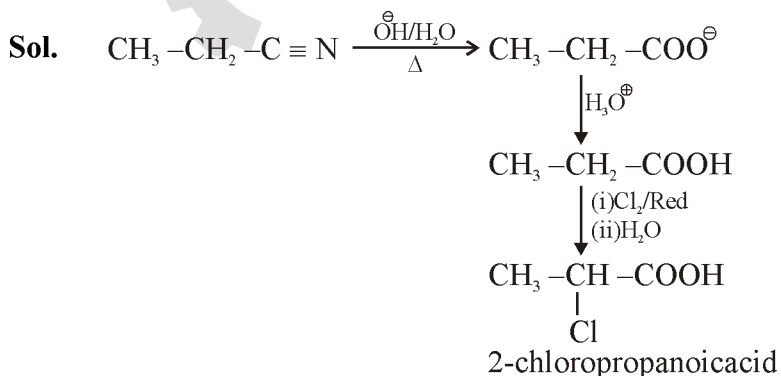
65. Complete the following reactions sequence and give the name of major product 'P'.



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- (1) 2-Chloropropanoic acid (2) 3-Chloropropanoic acid
 (3) 1-Chloropropane (4) 2-Chloropropane

Ans. (1)



Question Id : 691121516

66. Given below are two statements :

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Statement I : The condensation reaction between $\text{CH}_3\text{-CH=O}$ and $\text{H}_2\text{N-NH-C-NH}_2$ under optimum pH



will produce $\text{CH}_3\text{-CH=N-C-NH}_2$.



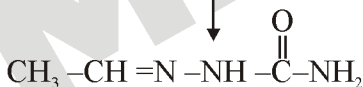
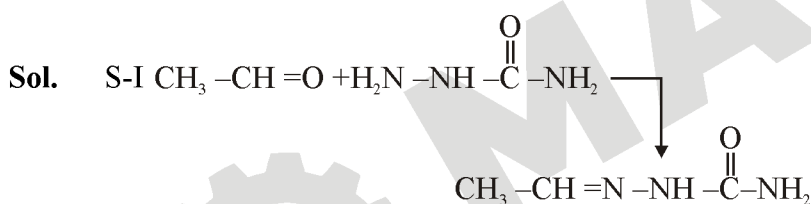
Statement II : The molecule, $\text{Ph-CH} \begin{array}{l} \text{O-H} \\ \text{O-CH}_3 \end{array}$ will generate Ph-CO=O in the presence of dilute acid.

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

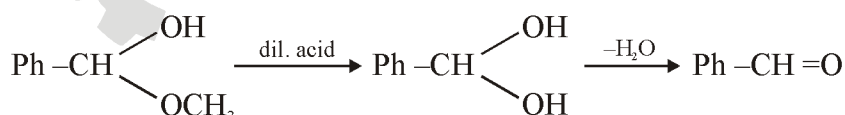
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- (1) Both Statement I and Statement II are true.
- (2) Both Statement I and Statement II are false.
- (3) Statement I is true but Statement II is false.
- (4) Statement I is false but Statement II is true.

Ans. (4)



S-II Hemiacetal are unstable in acidic medium so, get easily hydrolysed do give corresponding carbonyl compound.



Question Id : 691121517

67. Given below are two statements :

Statement I : Heating benzamide with bromine in an ethanolic solution of sodium hydroxide will give benzylamine.

Statement II : Nitration of aniline with $\text{HNO}_3/\text{H}_2\text{SO}_4$ at 288 K produces m-nitroaniline in higher amount than o-nitroaniline (pH adjusted).

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

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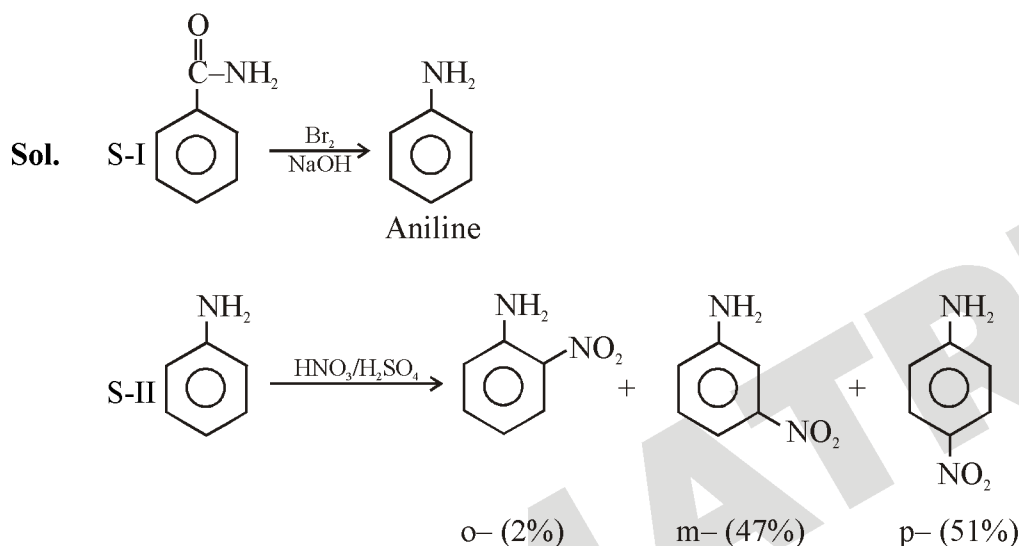
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- (1) Both Statement I and Statement II are true.
 (2) Both Statement I and Statement II are false.
 (3) Statement I is true but Statement II is false.
 (4) Statement I is false but Statement II is true.

Ans. (4)



Question Id : 691121518

68. Identify the incorrect statement about tertiary structure of proteins.

¶

- (1) They can be fibrous or globular in structure.
 (2) The main forces that stabilize the structure are hydrogen bonding, disulphide links, van der Waals and electrostatic forces of attraction.
 (3) The structure remains intact when exposed to pH changes.
 (4) A linear polypeptide chain will convert to a secondary structure and then further folding of the secondary structure will convert to tertiary structure.

Ans. (3)

Sol. There is significant change in tertiary structure of protein when exposed to pH changes.

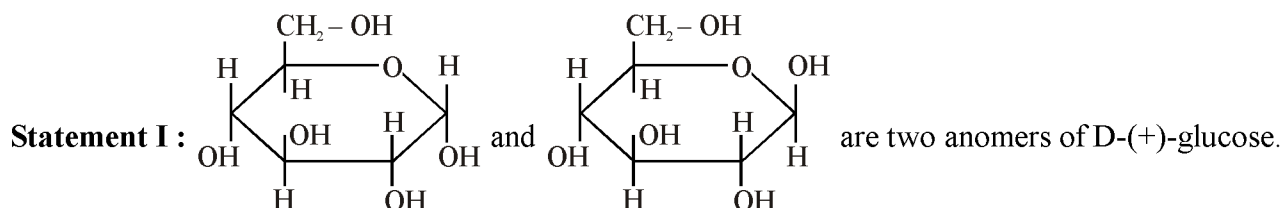
Question Id : 691121519

69. Given below are two statements :

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Statement II : The open chain forms of D-glucose and D-fructose contain three similar chiral carbons at C₃, C₄ and C₅.

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

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- (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. S-I α-D-Glucose and β-D-Glucose are two anomers of D(+)-glucose.

S-II In glucose & fructose, at C-3, C-4 and C-5, chiral carbon have same configuration.

Question Id : 691121520

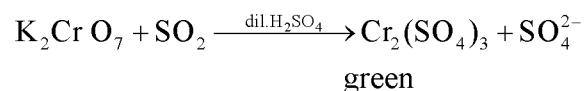
70. A paper dipped in a dil. H₂SO₄ solution of 'X' upon treatment with SO₂ gas turns into green. The compound 'X' is :

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- (1) KI-starch (2) KMnO₄ (3) Pb(CH₃COO)₂ (4) K₂Cr₂O₇

Ans. (4)

Sol. SO₂ acts as reducing agent



SECTION - B

Question Id : 691121521

71. The total number of unpaired electrons present in the d³, d⁴ (low spin) d⁵ (high spin), d⁶ (high spin)



among d^7 (low spin) octahedral complex systems is _____.

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Ans. (15)

Sol.	E.C.	No of unpaired e^-
	d^3	3
	d^4 (low spin)	2
	d^5 (high spin)	5
	d^6 (high spin)	4
	d^7 (low spin)	1
		15

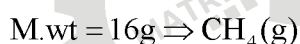
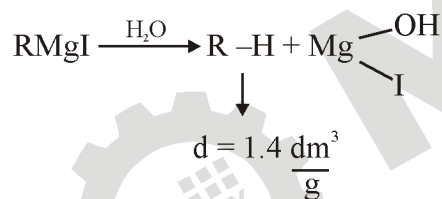
Question Id : 691121522

72. RMgI when treated with ice cold water liberated a gas which occupied $1.4 \text{ dm}^3/\text{g}$ at STP. The gas produced is further reacted with iodine in presence of HIO_3 to give compound (X). Compound (X) in presence of Na and dry ether produced compound (Y). Molar mass of compound (Y) is _____ g mol^{-1} . (Nearest integer)

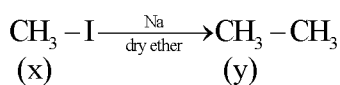
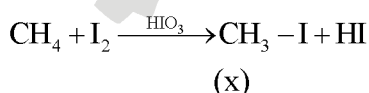
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Ans. (30)

Sol.



Methane



$$\text{Mwt} = 30\text{g mol}^{-1}$$

Question Id : 691121523

73. 20 g hemoglobin in a 1 L aqueous solution (A) at 300 K is separated from pure water by semi permeable membrane. At equilibrium the height of solution in a tube dipped in a solution (A) is found to be 80.0

mm higher than the tube dipped in water.

The molar mass of hemoglobin is _____ kg mol⁻¹. (Nearest integer)

(Given : $g = 10 \text{ ms}^{-2}$, $R = 8.3 \text{ kPa dm}^3 \text{ K}^{-1} \text{ mol}^{-1}$, density of solution = 1000 kg m^{-3})

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Ans. (62)

Sol. $\pi = dgh$

$$= 100 \times 10 \times 0.08$$

$$= 800 \text{ pa} = 0.8 \text{ K pa}$$

Let, M.wt of Hemoglobin = $M \text{ gmol}^{-1}$

$$\pi = CRT$$

$$0.8 \text{ K Pa} = \frac{20 / M}{1\text{L}} \times 8.3 \times 300$$

$$\Rightarrow M = 62.25 \text{ Kg mol}^{-1}$$

Question Id : 691121524

74. At 298 K, the molar conductivity of x% (w/w) MX solution (aqueous) is $12.35 \text{ S cm}^2 \text{ mol}^{-1}$. The conductance of same solution is $1.9 \times 10^{-3} \text{ s}$. The value of x is _____ $\times 10^{-2}$.

(Given : cell constant = 1.3 cm^{-1} ; molar mass of MX is 75 gmol^{-1} , density of aqueous solution of MX at 298 K is 1.0 g mL^{-1})

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Ans. (15)

Sol. $\Lambda_m = K \times \frac{1000}{M}$

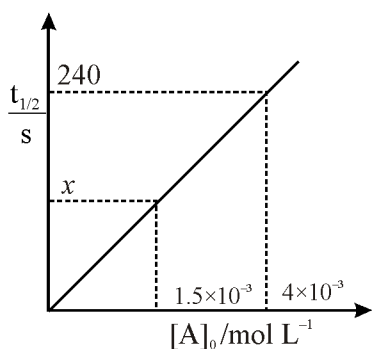
$$123.5 = (1.3 \times 1.9 \times 10^{-3}) \times \frac{1000}{M}$$

$$\Rightarrow M = 0.02 \text{ mol L}^{-1}$$

$$\%w / w = \frac{0.02 \times 75}{1000} \times 100 = 0.15 = 15 \times 10^{-2}$$

Question Id : 691121525

75. For a reaction $A \rightarrow P$ at T K, the half life ($t_{1/2}$) is plotted as a function of initial concentration $[A]_0$ of A as given below :



The value of x in the given figure is _____ s (Nearest integer)

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Ans. (90)

Sol. Since, $t_{1/2} \propto [A]_0^1 \Rightarrow$ zero order

and $t_{1/2} \propto [A]_0^{1-n}$

$$\frac{240}{x} = \left(\frac{4 \times 10^{-3}}{1.5 \times 10^{-3}} \right)^{1-0}$$

$$\frac{240}{x} = 2.67$$

$$\Rightarrow x = 89.88 \cong \boxed{90\text{sec}}$$