MENIIT
NEET | IIT-JEE | FOUNDATION

An Initiative of
MADE EASY

NEET 2024
PAPER SOLUTIONS

CHEMISTRY

Among Group 16 elements, which one does NOT show –2 oxidation state?

(1) O
(2) Se
(3) Te
(4) Po

Match List I with List II.

List I (Molecule)	List II (Number and types of bond/s between two carbon atoms)
A. ethane	I. one σ-bond and two π-bonds
B. ethene	II. two π-bonds
C. carbon molecule	III. one σ-bond
D. ethyne	IV. one σ-bond and one π-bond

Choose the correct answer from the options given below:

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

Fehling's solution 'A' is

(1) aqueous copper sulphate

(2) alkaline copper sulphate

(3) alkaline solution of sodium potassium tartrate (Rochelle's salt)

(4) aqueous sodium citrate

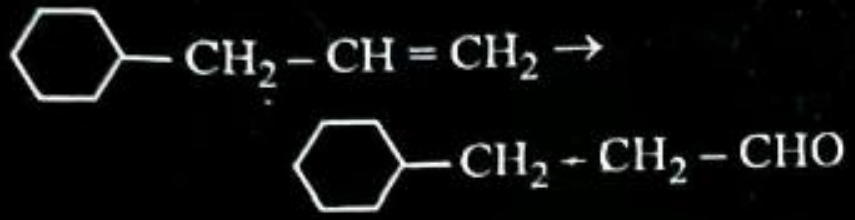
Match List I with List II.

List I (Conversion)	List II (Number of Faraday required)
A. 1 mol of H_2O to O_2	I. 3F
B. 1 mol of MnO_4^- to Mn^{2+}	II. 2F
C. 1.5 mol of Ca from molten $CaCl_2$	III. 1F
D. 1 mol of FeO to Fe_2O_3	IV. 5F

Choose the correct answer from the options given below:

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

Identify the correct reagents that would bring about the following transformation.



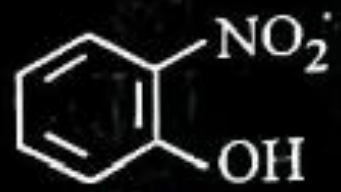
(1) (i) H_2O/H^+
(ii) CrO_3

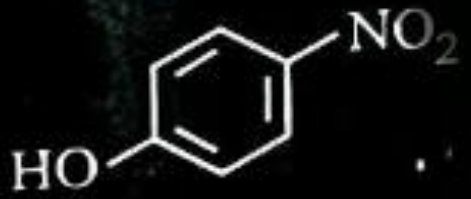
(2) (i) BH_3
(ii) $H_2O_2/\overset{\ominus}{O}H$
(iii) PCC

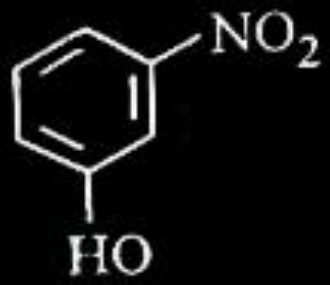
(3) (i) BH_3
(ii) $H_2O_2/\overset{\ominus}{O}H$
(iii) alk. KMnO
(iv) $H_3O^{\oplus}$

(4) (i) H_2O/H^+
(ii) PCC

Intramolecular hydrogen bonding is present in

(1) 

(2) 

(3) 

(4) HF

Activation energy of any chemical reaction can be calculated if one knows the value of

(1) rate constant at standard temperature.

(2) probability of collision.

(3) orientation of reactant molecules during collision.

(4) rate constant at two different temperatures.

Match List I with List II.

List I (Complex)	List II (Type of isomerism)
A. $\left[Co(NH_3)_5(NO_2)\right]Cl_2$	I. Solvate isomerism
B. $\left[Co(NH_3)_5(SO_4)\right]Br$	II. Linkage isomerism
C. $\left[Co(NH_3)_6\right]\left[Cr(CN)_6\right]$	III. Ionization isomerism
D. $\left[Co(H_2O)_6\right]Cl_3$	IV. Coordination isomerism

Choose the correct answer from the options given below:

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

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

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

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

1 gram of sodium hydroxide was treated with 25 mL of 0.75 M HCl solution, the mass of sodium hydroxide left unreacted is equal to

(1) 750 mg

(2) 250 mg

(3) Zero mg

(4) 200 mg

Arrange the following elements in increasing order of electronegativity:

N, O, F, C, Si

Choose the correct answer from the options given below:

(1) $Si < C < N < O < F$

(2) $Si < C < O < N < F$

(3) $O < F < N < C < Si$

(4) $F < O < N < C < Si$

Match List I with List II.

List I (Process)		List II (Conditions)
A. Isothermal process	I.	No heat exchange
B. Isochoric process	II.	Carried out at constant temperature
C. Isobaric process	III.	Carried out at constant volume
D. Adiabatic process	IV.	Carried out at constant pressure

Choose the correct answer from the options given below:

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

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

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

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

Which one of the following alcohols reacts instantaneously with Lucas reagent?

(1) $CH_3-CH_2-CH_2-CH_2OH$

(2) $CH_3-CH_2-\underset{\displaystyle CH_3}{\overset{|}{CH}}-OH$

(3) $CH_3-\underset{\displaystyle CH_3}{\overset{|}{CH}}-CH_2OH$

(4) $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}-OH$

The energy of an electron in the ground state ($n = 1$) for He^+ ion is $-x$ J, then that for an electron in $n = 2$ state for Be^{3+} ion in J is :

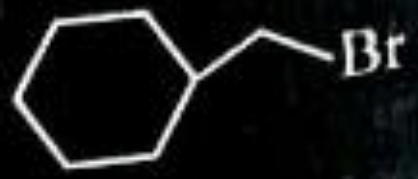
(1) $-x$

(2) $-\frac{x}{9}$

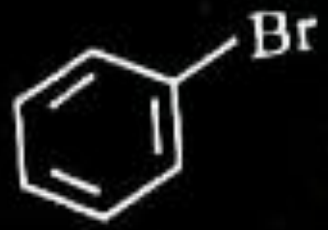
(3) $-4x$

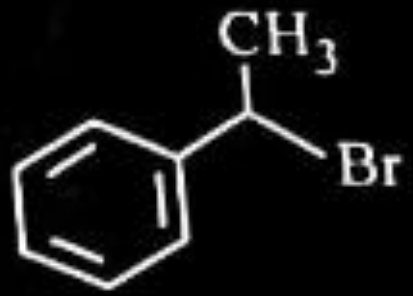
(4) $-\frac{4}{9}x$

The compound that will undergo S_N1 reaction with the fastest rate is

(1) 

(2) 

(3) 

(4) 

The Henry's law constant (K_H) values of thre gases (A, B, C) in water are 145, 2×10^{-5} an 35 kbar, respectively. The solubility of these gas in water follow the order:

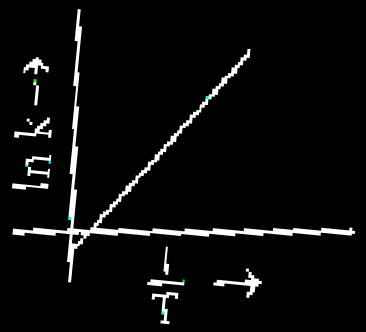
(1) B > A > C

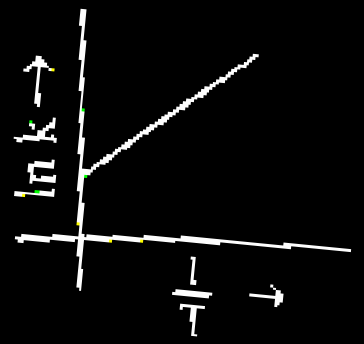
(2) B > C > A

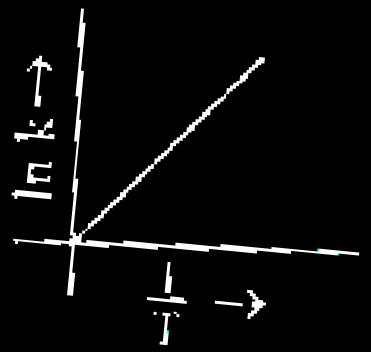
(3) A > C > B

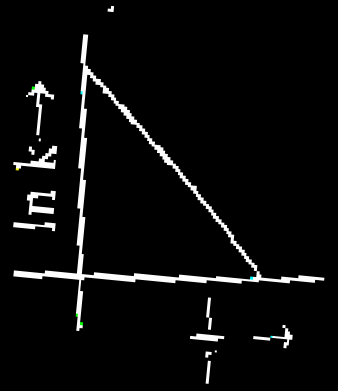
(4) A > B > C

Which plot of ln k vs $\frac{1}{T}$ is consistent with Arrhenius equation?

(1) 

(2) 

(3) 

(4) 

In which of the following equilibria, K_p and K_c are NOT equal?

(1) $PCl_{5(g)} \rightleftharpoons PCl_{3(g)} + Cl_{2(g)}$

(2) $H_{2(g)} + I_{2(g)} \rightleftharpoons 2\,HI_{(g)}$

(3) $CO_{(g)} + H_2O_{(g)} \rightleftharpoons CO_{2(g)} + H_2$

(4) $2\,BrCl_{(g)} \rightleftharpoons Br_{2(g)} + Cl_{2(g)}$

Given below are two statements:

Statement I : The boiling point of three isomeric pentanes follows the order

n-pentane > isopentane > neopentane

Statement II : When branching increases, the molecule attains a shape of sphere. This results in smaller surface area for contact, due to which the intermolecular forces between the spherical molecules are weak, thereby lowering the boiling point.

In the light of the above statements, choose the *most appropriate* 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.

The reagents with which glucose does **not** react to give the corresponding tests/products are

A. Tollen's reagent

B. Schiff's reagent

C. HCN

D. NH_2OH

E. $NaHSO_3$

Choose the correct options from the given below:

(1) B and C (2) A and D

(3) B and E (4) E and D

In which of the following processes entropy increases?

A. A liquid evaporates to vapour.

B. Temperature of a crystalline solid lowered from 130 K to 0 K.

C. $2\,NaHCO_{3(s)} \rightarrow Na_2CO_{3(s)} + CO_{2(g)} + H_2O_{(g)}$

D. $Cl_{2(g)} \rightarrow 2\,Cl_{(g)}$

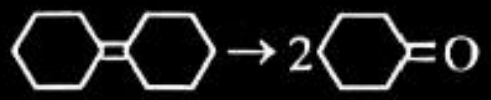
Choose the correct answer from the options given below:

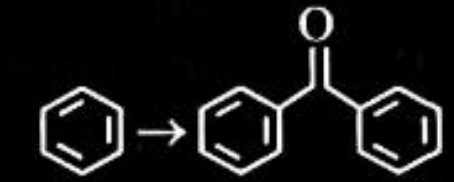
(1) A and C (2) A, B and D

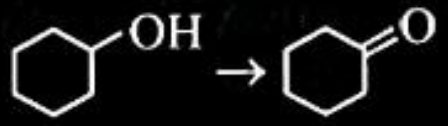
(3) A, C and D (4) C and D

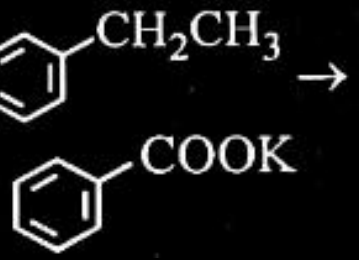
Match List I with List II.

List I (Reaction)

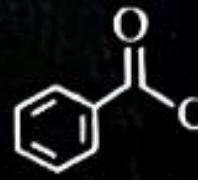
A. 

B. 

C. 

D. 

List II (Reagents/ Condition)

I.  Anhyd. $AlCl_3$

II. CrO_3

III. $KMnO_4$/ KOH, Δ

IV. (i) O_3

(ii) Zn-H_2O

Choose the correct answer from the options given below:

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

Given below are two statements:

Statement I : The boiling point of hydrides of Group 16 elements follow the order $H_2O > H_2Te > H_2Se > H_2S$.

Statement II : On the basis of molecular mass, H_2O is expected to have lower boiling point than the other members of the group but due to the presence of extensive H-bonding in H_2O, it has higher boiling point.

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.

For the reaction $2A \rightleftharpoons B + C$, $K_c = 4 \times 10^{-3}$. At a given time, the composition of reaction mixture is : $[A] = [B] = [C] = 2 \times 10^{-3} M$.

Then, which of the following is correct?

(1) Reaction is at equilibrium.

(2) Reaction has a tendency to go in forward direction.

(3) Reaction has a tendency to go in backward direction.

(4) Reaction has gone to completion in forward direction.

Match List I with List II.

List I Quantum Number	List II Information provided
A. m_l	I. shape of orbital
B. m_s	II. size of orbital
C. l	III. orientation of orbital
D. n	IV. orientation of spin of electron

Choose the correct answer from the options given below:

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

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

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

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

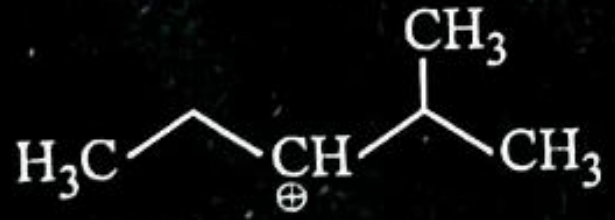
A compound with a molecular formula of C_6H_{14} has two tertiary carbons. Its IUPAC name is:

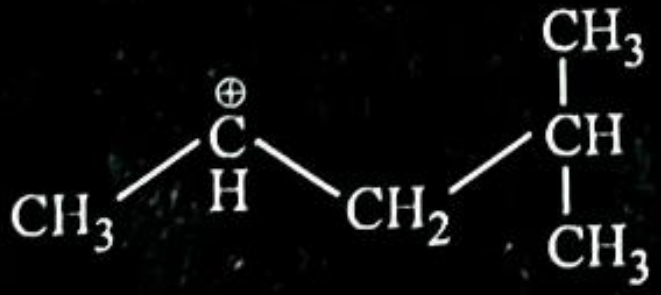
(1) n-hexane
(2) 2-methylpentane
(3) 2,3-dimethylbutane
(4) 2,2-dimethylbutane

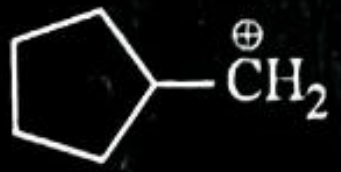
On heating, some solid substances change from solid to vapour state without passing through liquid state. The technique used for the purification of such solid substances based on the above principle is known as

(1) Crystallization
(2) Sublimation
(3) Distillation
(4) Chromatography

The most stable carbocation among the following is:

(1) 

(2) 

(3) 

(4) 

Given below are two statements:

Statement I : Aniline does not undergo Friedel-Crafts alkylation reaction.

Statement II : Aniline cannot be prepared through Gabriel synthesis.

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 correct but Statement II false.

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

Which reaction is **NOT** a redox reaction?

(1) $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$

(2) $2\,KClO_3 + I_2 \rightarrow 2\,KIO_3 + Cl_2$

(3) $H_2 + Cl_2 \rightarrow 2\,HCl$

(4) $BaCl_2 + Na_2SO_4 \rightarrow BaSO_4 + 2\,NaCl$

Match List I with List II.

List I (Compound)	List II (Shape/geometry)
A. NH_3	I. Trigonal Pyrami
B. BrF_5	II. Square Planar
C. XeF_4	III. Octahedral
D. SF_6	IV. Square Pyramid

Choose the correct answer from the options below:

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

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

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

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

Arrange the following elements in incre order of first ionization enthalpy:

Li, Be, B, C, N

Choose the correct answer from the options below:

(1) Li < Be < B < C < N

(2) Li < B < Be < C < N

(3) Li < Be < C < B < N

(4) Li < Be < N < B < C

'Spin only' magnetic moment is same for which of the following ions?

A. Ti^{3+} B. Cr^{2+}

C. Mn^{2+} D. Fe^{2+}

E. Sc^{3+}

Choose the most appropriate answer from the options given below:

(1) B and D only

(2) A and E only

(3) B and C only

(4) A and D only

The E° value for the Mn^{3+}/Mn^{2+} couple is more positive than that of Cr^{3+}/Cr^{2+} or Fe^{3+}/Fe^{2+} due to change of

(1) d^5 to d^4 configuration

(2) d^5 to d^2 configuration

(3) d^4 to d^5 configuration

(4) d^3 to d^5 configuration

The highest number of helium atoms is in

(1) 4 mol of helium

(2) 4 u of helium

(3) 4 g of helium

(4) 2.271098 L of helium at STP

Given below are two statements :

Statement I : Both $\left[Co\left(NH_3\right)_6\right]^{3+}$ and $\left[CoF_6\right]^{3-}$ complexes are octahedral but differ in their magnetic behaviour.

Statement II : $\left[Co\left(NH_3\right)_6\right]^{3+}$ is diamagnetic whereas $\left[CoF_6\right]^{3-}$ is paramagnetic.

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.

The pair of lanthanoid ions which are diamagnetic is

(1) Ce^{4+} and Yb^{2+}

(2) Ce^{3+} and Eu^{2+}

(3) Gd^{3+} and Eu^{3+}

(4) Pm^{3+} and Sm^{3+}

Given below are certain cations. Using inorganic qualitative analysis, arrange them in increasing group number from 0 to VI.

A. Al^{3+} B. Cu^{2+}

C. Ba^{2+} D. Co^{2+}

E. Mg^{2+}

Choose the correct answer from the options given below:

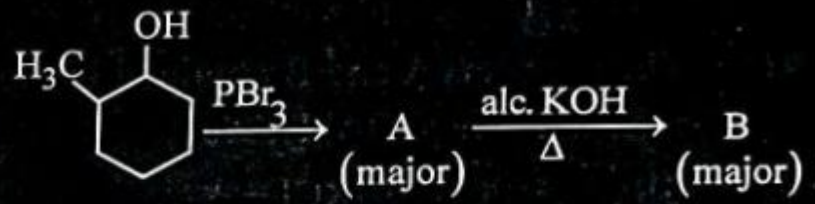
(1) B, A, D, C, E

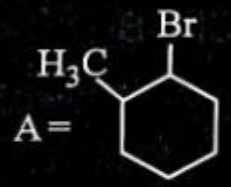
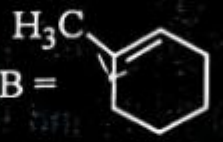
(2) B, C, A, D, E

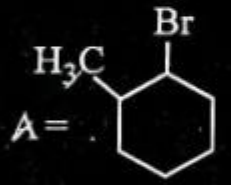
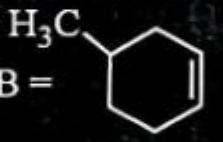
(3) E, C, D, B, A

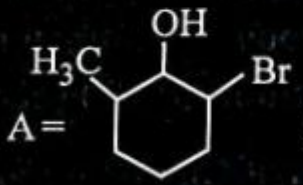
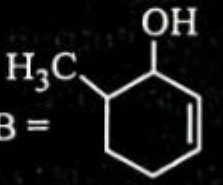
(4) E, A, B, C, D

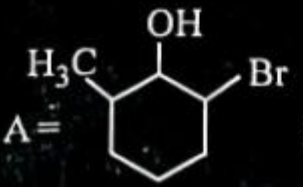
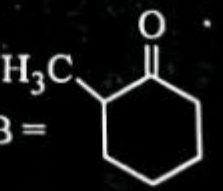
Major products A and B formed in the following reaction sequence, are



(1) A =  ; B = 

(2) A =  ; B = 

(3) A =  ; B = 

(4) A =  ; B = 

The work done during reversible isothermal expansion of one mole of hydrogen gas at 25°C from pressure of 20 atmosphere to 10 atmosphere is:

(Given $R = 2.0$ cal K^{-1} mol^{-1})

(1) 0 calorie

(2) – 413.14 calories

(3) 413.14 calories

(4) 100 calories

Identify the major product C formed in the following reaction sequence :

$$CH_3-CH_2-CH_2-I \xrightarrow{NaCN} A$$

$$\xrightarrow[\text{Partial hydrolysis}]{OH^-} B \xrightarrow[Br_2]{NaOH} \underset{\text{(major)}}{C}$$

(1) propylamine

(2) butylamine

(3) butanamide

(4) α bromobutanoic acid

The products A and B obtained in the following reactions, respectively, are

$3ROH + PCl_3 \rightarrow 3RCl + A$

$ROH + PCl_5 \rightarrow RCl + HCl + B$

(1) $POCl_3$ and H_3PO_3

(2) $POCl_3$ and H_3PO_4

(3) H_3PO_4 and $POCl_3$

(4) H_3PO_3 and $POCl_3$

Mass in grams of copper deposited by passing 9.6487 A current through a voltmeter containing copper sulphate solution for 100 seconds is:

(Given · Molar mass of Cu : 63 g mol^{-1}, 1F = 96487 C)

(1) 3.15 g

(2) 0.315 g

(3) 31.5 g

(4) 0.0315 g

A compound X contains 32% of A, 20% of B and remaining percentage of C. Then, the empirical formula of X is :
(Given atomic masses of A = 64; B = 40; C = 32 u)

(1) A_2BC_2
(2) ABC_3
(3) AB_2C_2
(4) ABC_4

During the preparation of Mohr's salt solution (Ferrous ammonium sulphate), which of the following acid is added to prevent hydrolysis of Fe^{2+} ion?

(1) dilute hydrochloric acid
(2) concentrated sulphuric acid
(3) dilute nitric acid
(4) dilute sulphuric acid

Identify the **correct** answer.

(1) Three resonance structures can be drawn fo
ozone.

(2) BF_3 has non-zero dipole moment.

(3) Dipole moment of NF_3 is greater than tha
of NH_3.

(4) Three canonical forms can be drawn fo
CO_3^{2-} ion.

The rate of a reaction quadruples wher temperature changes from 27°C to 57°C. Calculate the energy of activation.

Given $R = 8.314\ J\ K^{-1}\ mol^{-1}$, $\log 4 = 0.6021$

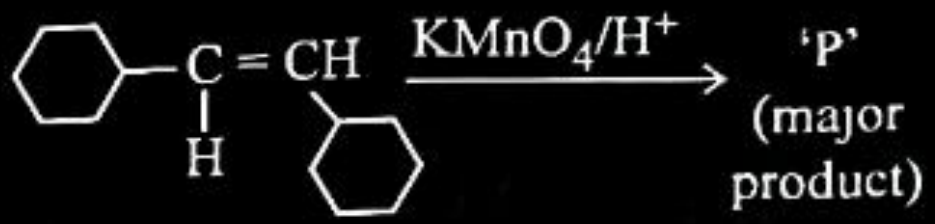
(1) 38.04 kJ/mol

(2) 380.4 kJ/mol

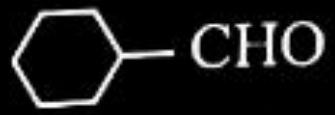
(3) 3.80 kJ/mol

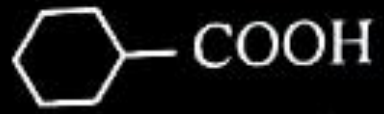
(4) 3804 kJ/mol

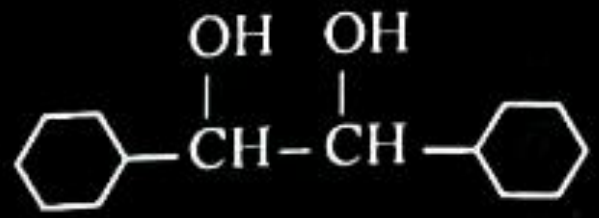
For the given reaction:

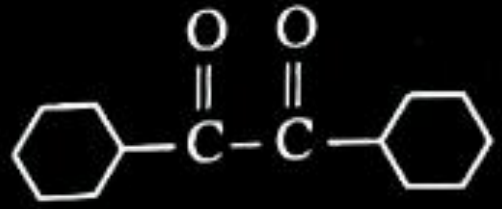


'P' is

(1) 

(2) 

(3) 

(4) 

The plot of osmotic pressure (Π) vs concentration (mol L^{-1}) for a solution gives a straight line with slope 25.73 L bar mol^{-1}. The temperature at which the osmotic pressure measurement is done is:

(Use R = 0.083 L bar mol^{-1} K^{-1})

(1) 37°C

(2) 310°C

(3) 25.73°C

(4) 12.05°C

Given below are two statements :

Statement I : $\left[Co(NH_3)_6\right]^{3+}$ is a homoleptic complex whereas $\left[Co(NH_3)_4Cl_2\right]^{+}$ is a heteroleptic complex.

Statement II : Complex $\left[Co(NH_3)_6\right]^{3+}$ has only one kind of ligands but $\left[Co(NH_3)_4Cl_2\right]^{+}$ has more than one kind of ligands.

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.

Consider the following reaction in a sealed vessel at equilibrium with concentrations of

$N_2 = 3.0 \times 10^{-3}$ M, $O_2 = 4.2 \times 10^{-3}$ M and

$NO = 2.8 \times 10^{-3}$ M.

$$2NO_{(g)} \rightleftharpoons N_{2(g)} + O_{2(g)}$$

If 0.1 mol L^{-1} of $NO_{(g)}$ is taken in a closed vessel, what will be degree of dissociation (α) of $NO_{(g)}$ at equilibrium?

(1) 0.00889

(2) 0.0889

(3) 0.8889

(4) 0.717

MENIIT
NEET | IIT-JEE | FOUNDATION

An Initiative of
MADE EASY

THANK YOU