

Chemistry Section A

Section Id :	864351315
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	864351315
Question Shuffling Allowed :	Yes

Question Number : 31 Question Id : 8643514711 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

In a binary compound, atoms of element A form a hcp structure and those of element M occupy $\frac{2}{3}$ of the tetrahedral voids of the hcp structure. The formula of the binary compound is :

Options :

86435114131. M_2A_3 86435114132. M_4A_3 86435114133. MA_3 86435114134. M_4A **Question Number : 32 Question Id : 8643514712 Question Type : MCQ Option Shuffling : Yes Is****Question Mandatory : No****Correct Marks : 4 Wrong Marks : 1**

A certain orbital has no angular nodes and two radial nodes. The orbital is :

Options :86435114135. $2s$ 86435114136. $2p$ 86435114137. $3s$ 86435114138. $3p$ **Question Number : 33 Question Id : 8643514713 Question Type : MCQ Option Shuffling : Yes Is****Question Mandatory : No****Correct Marks : 4 Wrong Marks : 1**

Match List - I with List - II :

List - I

(Process)

(a) Deacon's process

(b) Contact process

(c) Cracking of hydrocarbons

(d) Hydrogenation of vegetable oils

List - II

(Catalyst)

(i) ZSM-5

(ii) $CuCl_2$

(iii) Particles 'Ni'

(iv) V_2O_5

Choose the most appropriate answer from the options given below :

Options :

86435114139. (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)

86435114140. (a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)

86435114141. (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

86435114142. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

Question Number : 34 Question Id : 8643514714 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The ionic radius of Na^+ ion is 1.02 \AA . The ionic radii (in Å) of Mg^{2+} and Al^{3+} , respectively, are :

Options :

86435114143. 0.85 and 0.99

86435114144. 0.72 and 0.54

86435114145. 0.68 and 0.72

86435114146. 1.05 and 0.99

Question Number : 35 Question Id : 8643514715 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The chemical that is added to reduce the melting point of the reaction mixture during the extraction of aluminium is :

Options :

86435114147. Bauxite

86435114148. Kaolite

86435114149. Calamine

86435114150. Cryolite

Question Number : 36 Question Id : 8643514716 Question Type : MCQ Option Shuffli Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two Statements : One is labelled as Assertion A and the other is labelled as Reason R :

Assertion A : During the boiling of water having temporary hardness, $\text{Mg}(\text{HCO}_3)_2$ is converted to MgCO_3 .

Reason R : The solubility product of $\text{Mg}(\text{OH})_2$ is greater than that of MgCO_3 .

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

Options :

86435114151. Both A and R are true and R is the correct explanation of A

86435114152. Both A and R are true but R is NOT the correct explanation of A

86435114153. A is true but R is false

86435114154. A is false but R is true

Question Number : 37 Question Id : 8643514717 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match List - I with List - II :

List - I	List - II
(a) $\text{Ca}(\text{OCl})_2$	(i) Antacid
(b) $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$	(ii) Cement
(c) CaO	(iii) Bleach
(d) CaCO_3	(iv) Plaster of Paris

Choose the most appropriate answer from the options given below :

Options :

86435114155. (a)-(i), (b)-(iv), (c)-(iii), (d)-(ii)

86435114156. (a)-(iii), (b)-(ii), (c)-(i), (d)-(iv)

86435114157. (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)

86435114158. (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)

Question Number : 38 Question Id : 8643514718 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The number of ionisable hydrogens present in the product obtained from a reaction of phosphorus trichloride and phosphonic acid is :

Options :

86435114159. ¹

86435114160. ²

86435114161. ⁰

86435114162. ³

Question Number : 39 Question Id : 8643514719 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match List - I with List - II :

List - I	List - II
(a) Chlorophyll	(i) Ruthenium
(b) Vitamin - B ₁₂	(ii) Platinum
(c) Anticancer drug	(iii) Cobalt
(d) Grubbs catalyst	(iv) Magnesium

Choose the most appropriate answer from the options given below :

Options :

86435114163. (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)

86435114164. (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

86435114165. (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)

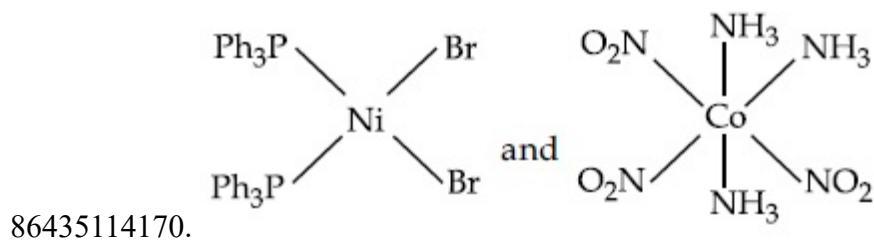
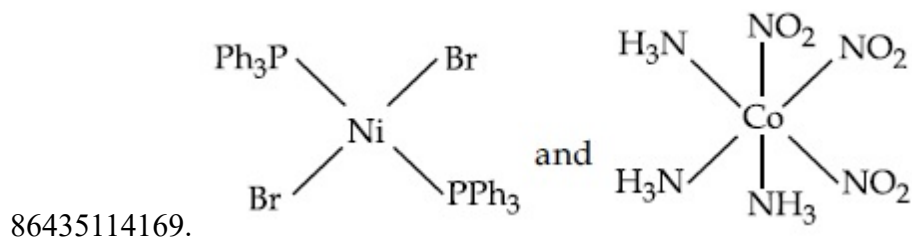
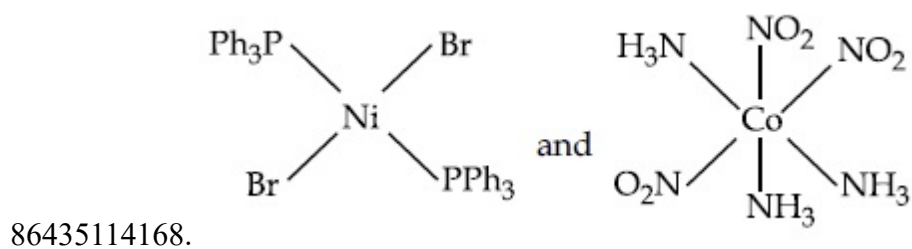
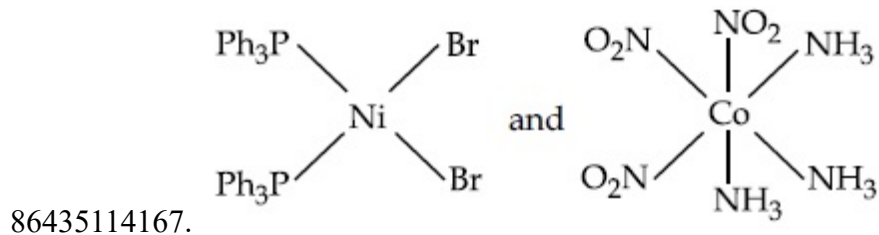
86435114166. (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

Question Number : 40 Question Id : 8643514720 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The correct structures of $\text{trans-[NiBr}_2(\text{PPh}_3)_2]$ and meridional- $[\text{Co}(\text{NH}_3)_3(\text{NO}_2)_3]$, respectively, are :

Options :



Question Number : 41 Question Id : 8643514721 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The statements that are TRUE :

- (A) methane leads to both global warming and photochemical smog
- (B) methane is generated from paddy fields
- (C) methane is a stronger global warming gas than CO₂
- (D) methane is a part of reducing smog.

Choose the most appropriate answer from the options given below :

Options :

86435114171. (A) and (B) only

86435114172. (A), (B), (C) only

86435114173. (B), (C), (D) only

86435114174. (A), (B), (D) only

Question Number : 42 Question Id : 8643514722 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Compound with molecular formula C₃H₆O can show :

Options :

86435114175. Positional isomerism

86435114176. Functional group isomerism

86435114177. Metamerism

86435114178. Both positional isomerism and metamerism

Question Number : 43 Question Id : 8643514723 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match List - I with List - II :

List - I

(Chemicals)

- (a) Alcoholic potassium hydroxide
- (b) Pd/BaSO₄
- (c) BHC (Benzene hexachloride)
- (d) Polyacetylene

List - II

(Use/Preparation/Constituent)

- (i) electrodes in batteries
- (ii) obtained by addition reaction
- (iii) used for β -elimination reaction
- (iv) Lindlar's Catalyst

Choose the most appropriate match :

Options :

86435114179. (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

86435114180. (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

86435114181. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

86435114182. (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)

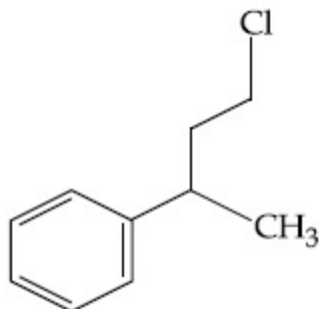
Question Number : 44 Question Id : 8643514724 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

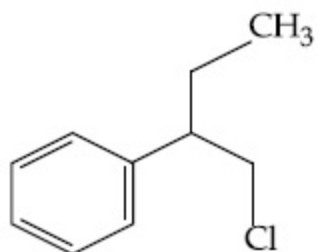
Reaction of Grignard reagent, C₂H₅MgBr with C₈H₈O followed by hydrolysis gives compound "A" which reacts instantly with Lucas reagent to give compound B, C₁₀H₁₃Cl.

The Compound B is :

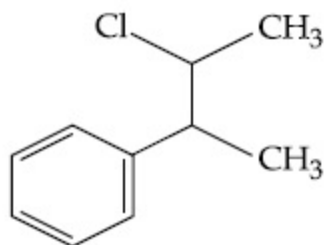
Options :



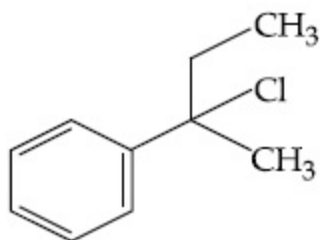
86435114183.



86435114184.



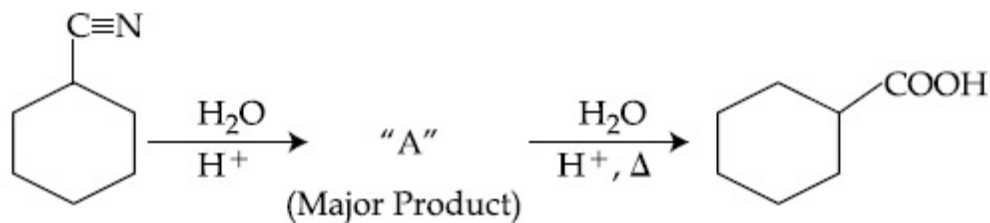
86435114185.



86435114186.

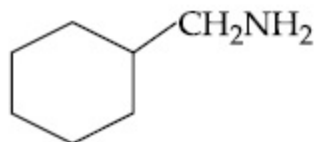
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Correct Marks : 4 Wrong Marks : 1

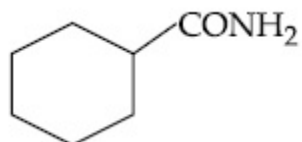


Consider the above chemical reaction and identify product "A" :

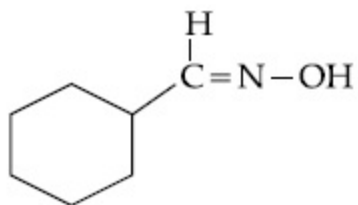
Options :



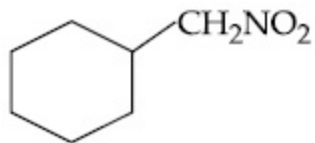
86435114187.



86435114188.

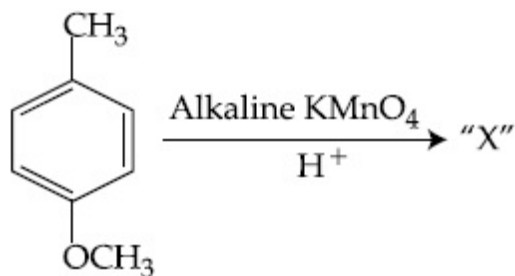


86435114189.



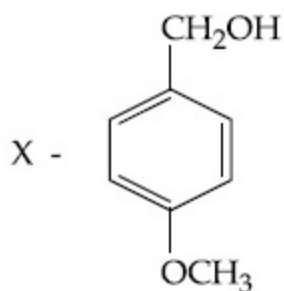
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Question Number : 46 Question Id : 8643514726 Question Type : MCQ Option Shuffling : Yes Is
 Question Mandatory : No
 Correct Marks : 4 Wrong Marks : 1

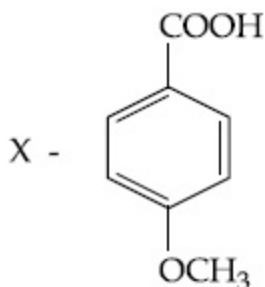


Considering the above chemical reaction, identify the product "X" :

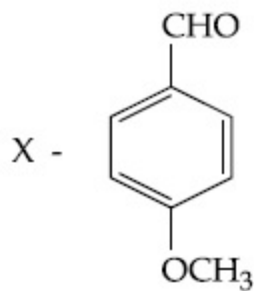
Options :



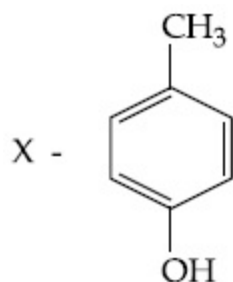
86435114191.



86435114192.

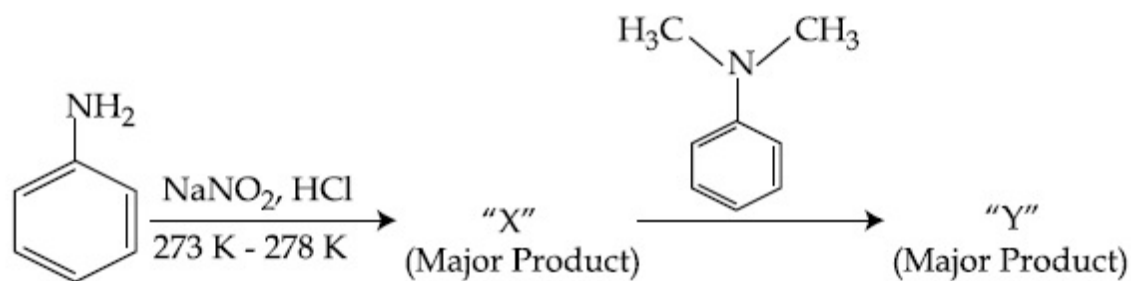


86435114193.



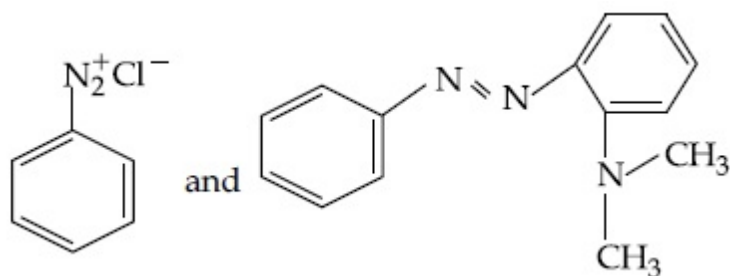
86435114194.

Question Number : 47 Question Id : 8643514727 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

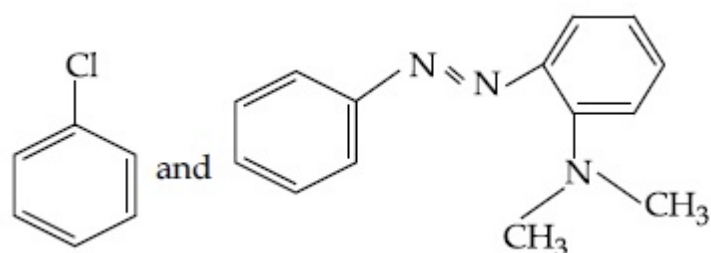


Considering the above reaction, X and Y respectively are :

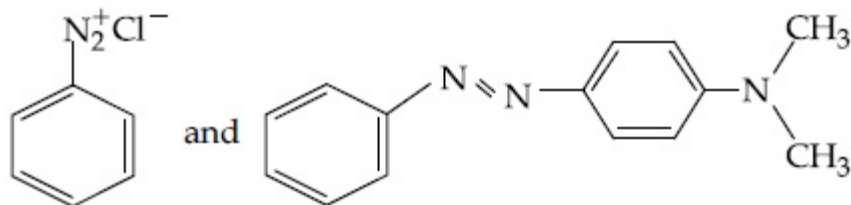
Options :



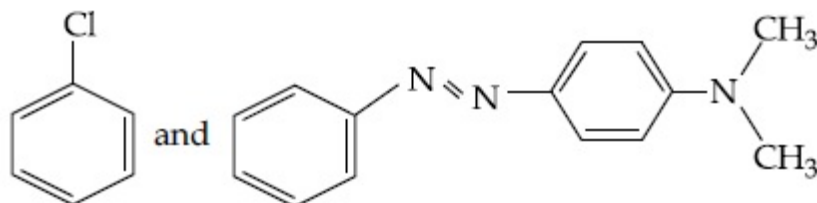
86435114195.



86435114196.



86435114197.



86435114198.

Question Number : 48 Question Id : 8643514728 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match List - I with List - II :

List - I	List - II
(Class of Drug)	(Example)
(a) Antacid	(i) Novestrol
(b) Artificial Sweetener	(ii) Cimetidine
(c) Antifertility	(iii) Valium
(d) Tranquilizers	(iv) Alitame

Choose the most appropriate match :

Options :

86435114199. (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)

86435114200. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

86435114201. (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

86435114202. (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

Question Number : 49 Question Id : 8643514729 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A non-reducing sugar "A" hydrolyses to give two reducing mono saccharides. Sugar A is :

Options :

86435114203. Glucose

86435114204. Fructose

86435114205. Galactose

86435114206. Sucrose

Question Number : 50 Question Id : 8643514730 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Reagent, 1-naphthylamine and sulphanilic acid in acetic acid is used for the detection of :

Options :

86435114207. NO_2^-

86435114208. NO_3^-

86435114209. NO

86435114210. N_2O

Chemistry Section B

Section Id :	864351316
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	864351316
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 8643514731 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Complete combustion of 3 g of ethane gives $x \times 10^{22}$ molecules of water. The value of x is _____ . (Round off to the Nearest Integer).

[Use : $N_A = 6.023 \times 10^{23}$; Atomic masses in u : C : 12.0 ; O : 16.0 ; H : 1.0]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 52 Question Id : 8643514732 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

AX is a covalent diatomic molecule where A and X are second row elements of periodic table. Based on Molecular orbital theory, the bond order of AX is 2.5. The total number of electrons in AX is _____. (Round off to the Nearest Integer).

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

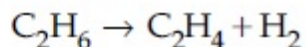
Possible Answers :

100

Question Number : 53 Question Id : 8643514733 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

For the reaction



the reaction enthalpy $\Delta_r H =$ _____ kJ mol^{-1} . (Round off to the Nearest Integer).

[Given : Bond enthalpies in kJ mol^{-1} : C - C : 347, C = C : 611;

C - H : 414, H - H : 436]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 54 Question Id : 8643514734 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

2 molal solution of a weak acid HA has a freezing point of 3.885°C . The degree of dissociation of this acid is _____ $\times 10^{-3}$. (Round off to the Nearest Integer).

[Given : Molal depression constant of water = $1.85 \text{ K kg mol}^{-1}$

Freezing point of pure water = 0°C]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 55 Question Id : 8643514735 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

In order to prepare a buffer solution of pH 5.74, sodium acetate is added to acetic acid. If the concentration of acetic acid in the buffer is 1.0 M, the concentration of sodium acetate in the buffer is _____ M. (Round off to the Nearest Integer).

[Given : pK_a (acetic acid) = 4.74]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

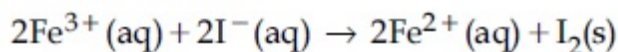
Possible Answers :

100

Question Number : 56 Question Id : 8643514736 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

For the reaction



the magnitude of the standard molar free energy change,

$$\Delta_r G_m^\circ = - \text{_____ kJ (Round off to the Nearest Integer)}.$$

$$\left[\begin{array}{l} E^\circ_{\text{Fe}^{2+}/\text{Fe}(\text{s})} = -0.440 \text{ V}; E^\circ_{\text{Fe}^{3+}/\text{Fe}(\text{s})} = -0.036 \text{ V} \\ E^\circ_{\text{I}_2/2\text{I}^{-}} = 0.539 \text{ V}; \quad F = 96500 \text{ C} \end{array} \right]$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

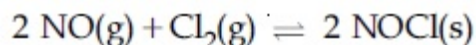
Text Areas : PlainText

Possible Answers :

100

Question Number : 57 **Question Id :** 8643514737 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0



This reaction was studied at -10°C and the following data was obtained

run	$[\text{NO}]_0$	$[\text{Cl}_2]_0$	r_0
1	0.10	0.10	0.18
2	0.10	0.20	0.35
3	0.20	0.20	1.40

$[\text{NO}]_0$ and $[\text{Cl}_2]_0$ are the initial concentrations and r_0 is the initial reaction rate.

The overall order of the reaction is _____. (Round off to the Nearest Integer).

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 58 **Question Id :** 8643514738 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

The total number of unpaired electrons present in the complex $\text{K}_3[\text{Cr}(\text{oxalate})_3]$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 59 Question Id : 8643514739 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

_____ grams of 3-Hydroxy propanal (MW = 74) must be dehydrated to produce 7.8 g of acrolein (MW = 56) (C_3H_4O) if the percentage yield is 64. (Round off to the Nearest Integer).

[Given : Atomic masses : C : 12.0 u, H : 1.0 u, O : 16.0 u]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 60 Question Id : 8643514740 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A reaction of 0.1 mole of Benzylamine with bromomethane gave 23 g of Benzyl trimethyl ammonium bromide. The number of moles of bromomethane consumed in this reaction are $n \times 10^{-1}$, when $n =$ _____. (Round off to the Nearest Integer).

[Given : Atomic masses : C : 12.0 u, H : 1.0 u, N : 14.0 u, Br : 80.0 u]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100