JEE Main April 2026

Question Paper With Text Solution

04 April | Shift -1

CHEMISTRY

MATRIX

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

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JEE MAIN APRIL 2026 | 04 APRIL SHIFT-1

SECTION – A

Question ID : 695278276

51. Number of moles and number of molecules in 1.4187 L of SO_2 at STP respectively are

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(1) $0.1266; 3.812\times10^{22}$ (2) $0.0633; 3.812\times10^{22}$

(3) $0.1266; 7.6238\times10^{22}$ (4) $0.0633; 7.6238\times10^{22}$

Ans. (2)

Sol. $\text{No. of mole} = \frac{1.4187}{22.4}$

$= 0.0633$

No. of molecules $= 0.0633\times6.023\times10^{23}$

$= 3.81\times10^{22}$

Question ID : 695278277

52. What is the ratio of wave number of first line (lowest energy line) of Balmer series of H atomic spectrum to first line of its Brackett series?

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(1) 5 : 1 (2) 5 : 0.81 (3) 5 : 1.75 (4) 5 : 27

Ans. (2)

Sol. $\bar{\nu}_1 = R_H(Z)^2\left[\frac{1}{2^2}-\frac{1}{3^2}\right] \Rightarrow 1^{st}$ line of Balmer series

$\bar{\nu}_2 = R_H(Z)^2\left[\frac{1}{4^2}-\frac{1}{5^2}\right] \Rightarrow 1^{st}$ line of Brackett series

$\Rightarrow \frac{\bar{\nu}_1}{\bar{\nu}_2} = \frac{500}{81}$

Question ID : 695278278

53. Which of the following is correct set of 4 quantum numbers of 19^{th} electron in Chromium (Atomic number =24) in accordance with Aufbau principle?

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(1) $n=3, l=2, m=+2, s=+\frac{1}{2}$ (2) $n=3, l=2, m=-2, s=+\frac{1}{2}$

(3) $n = 4, l = 1, m = 0, s = +\frac{1}{2}$ (4) $n = 4, l = 0, m = 0, s = +\frac{1}{2}$

Ans. (4)

Sol. Cr $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^1\ 3d^5$

19th e^- belongs to 4s subshell

$n = 4\ ;\ l = 0\ ;\ m = 0;\ s = +\frac{1}{2} \text{ or } -\frac{1}{2}$

Question ID : 695278279

54. Given below are two statements:

Statement I : For an ideal gas, heat capacity at constant volume is always greater than the heat capacity at constant pressure.

Statement II : In a constant volume process, no work is produced and all the heat withdrawn goes into the chaotic motion and is reflected by a temperature increase of the ideal gas.

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)

Sol. $C_p - C_V = R$

$C_P > C_V$ (Always)

Statement I $\longrightarrow$ false

Statement II $\longrightarrow$ true

At constant volume $\therefore \Delta U = 0$ $\therefore \boxed{w = 0}$

$\Delta U = q$

Question ID : 695278280

55. At T(K), the equilibrium constant of $A_2(g) + B_2(g) \rightleftharpoons C(g)$ is 2.7×10^{-5}. What is the equilibrium constant for $\frac{1}{3}A_2(g) + \frac{1}{3}B_2(g) \rightleftharpoons \frac{1}{3}C(g)$ at the same temperature?

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(1) $\left(2.7 \times 10^{-5}\right)^3$ (2) 6×10^{-2} (3) $\sqrt{2.7 \times 10^{-5}}$ (4) 3×10^{-2}

Ans. (4)

Sol. $A_2 + B_2 \rightleftharpoons C \qquad K_P = 2.7\times10^{-5}$

$\frac{1}{3}A_2 + \frac{1}{3}B_2 \rightleftharpoons \frac{1}{3}C \Rightarrow K_P' = (K_P)^{1/3}$

$K_P' = (2.7\times10^{-5})^{1/3}$

$K_P' = (27\times10^{-6})^{1/3}$

$K_P' = 3\times10^{-2}$

Question ID : 695278281

56. In order to oxidise a mixture of 1 mole each of $FeC_2O_4, Fe_2(C_2O_4)_3, FeSO_4$ and $Fe_2(SO_4)_3$ in acidic medium, the number of moles of $KMnO_4$ required is

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(1) 3 (2) 2 (3) 5 (4) 7

Ans. (2)

Sol. Meq. of $KMnO_4$ = Meq of $(FeC_2O_4 + FeSO_4 + Fe_2(C_2O_4)_3)$

moles × 5 = 1 × 3 + 1 ×1 + 1 ×6

$\text{moles} = \frac{10}{5}$

moles = 2

Question ID : 695278282

57. Consider the first order reaction $R \rightarrow P$.

The fraction of molecules decomposed in the given first order reaction can be expressed as

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(1) $1-e^{k_1t}$ (2) $1+e^{k_1t}$ (3) $1+e^{-k_1t}$ (4) $1-e^{-k_1t}$

Ans. (4)

Sol. For 1st order reaction

$a - x = ae^{-K_1t}$

$\Rightarrow x = a\left[1-e^{-K_1t}\right]$

$\Rightarrow \frac{X}{a} = '\alpha' = 1-e^{-K_1t}$

Question ID : 695278283

58. A monoatomic anion (A^-) has 45 neutrons and 36 electrons. Atomic mass, group in the periodic table and physical state at room temperature of the element (A) respectively are

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(1) 80, 17, liquid (2) 81,16, solid (3) 80,16, gas (4) 81,15 , gas

Ans. (1)

Sol. $X \rightarrow Br$

Atomic mass = 80

Group No = 17

State = liquid

Question ID : 695278284

59. Given below are two statements:

Statement I : The covalency of oxygen is generally two but it can exceed upto four. The oxidation state of oxygen in SO_2 is -2 and in OF_2 it is +2 .

Statement II : The anomalous behaviour of oxygen when compared to the other elements of group 16 is due to its small size and high electronegativity.

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. Oxygen can have covalency 4

In SO_2 ; O.S of O = –2

In OF_2 ; O.S of O = +2

Anamolous behavious of oxygen is due to high EN and small size.

Question ID : 695278285

60. The correct statements among the following are,

A. Mo(VI) and W(VI) are less stable than Cr(VI).

B. Ce^{4+} and Tb^{4+} are oxidant while Eu^{2+} and Yb^{2+} are reductant.

C. Cm and Am have seven unpaired electrons.

D. Actinoid contraction is greater from element to element than lanthanoid contraction.

Choose the correct answer from the options given below:

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(1) A and B Only (2) C and D Only (3) B and D Only (4) A and C Only

Ans. (3)

Sol. A. Stability $Cr^{+6} < Mo^{+6} < W^{+6}$

Mo(VI) and W(VI) are found to be more stable than Cr(VI)

B. Ce^{+4} & Tb^{4+} are oxidant

Eu^{2+} & $4b^{2+}$ are reductant

C. Cm has 8 unpaired e^-

D. Actinoid contraction is greater from element to element than lanthanoid contraction.

Question ID : 695278286

61. Correct statements from the following are

A. Potassium dichromate is an oxidising agent and it oxidises $FeSO_4$ to $Fe_2(SO_4)_3$ in acidic medium.

B. Sodium dichromate can be used as primary standard in volumetric estimation.

C. CrO_4^{2-} and $Cr_2O_7^{2-}$ are interconvertible in aqueous solution by varying the pH of the solution.

D. $Cr-O-Cr$ bond angle in $Cr_2O_7^{2-}$ is 126°.

Choose the correct answer from the options given below:

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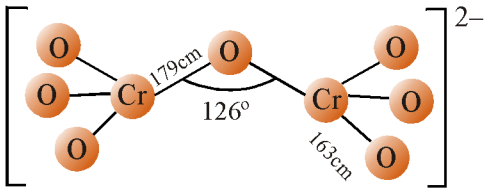
(1) A, B and C Only (2) A, C and D Only (3) A and C Only (4) B and D Only

Ans. (2)

Sol. A. $K_2Cr_2O_7 + Fe^{+2} \xrightarrow{H^+} Fe^{+3}$

B. $Na_2Cr_2O_7$ is not a primary standard

C. $CrO_4^{2-} \underset{OH^-}{\overset{H^+}{\rightleftharpoons}} Cr_2O_7^{2-}$



Dichromate ion

Question ID : 695278287

62. Match the LIST-I with LIST-II

List-I Complex ion	List-II Calculated spin only magnetic moment (BM)
A. $\left[Cr(H_2O)_6\right]^{2+}$	I. 3.87
B. $\left[Co(H_2O)_6\right]^{2+}$	II. 5.92
C. $\left[Cu(H_2O)_6\right]^{2+}$	III. 4.90
D. $\left[Mn(H_2O)_6\right]^{2+}$	IV. 1.73

Choose the correct answer from the options given below:

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

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

Ans. (4)

Sol. $[Cr(H_2O)_6]^{2+}$

Cr^{+2} : $3d^4$; 4 unpaired e^-

$\mu = 4.90$ BM

$[Co(H_2O)_6]^{2+}$

Co^{2+} : $3d^7$ $\therefore \mu = 3.87$ M

$[Cu(H_2O)_6]^{2+}$

Cu^{2+} : $3d^9$ $\therefore \mu = 1.73$ BM

$[Mn(H_2O)_6]^{2+}$

Mn^{2+} : $3d^5$ $\therefore \mu = 5.92$ BM

Question ID : 695278288

63. Increasing order of electron withdrawing power of following functional groups is:

a. -CN

b. -COOH

c. $-NO_2$

d. - I

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(1) c < b < d < a (2) c < a < b < d (3) d < b < a < c (4) a < b < c < d

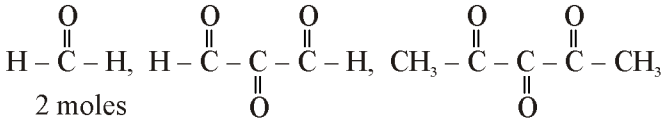
Ans. (3)

Sol. Electron with drawing nature :

$-NO_2 > -CN > -COOH > -I$

Question ID : 695278289

64. An alkene (X) on ozonolysis followed by reduction gives following products.



The alkene (X) is:

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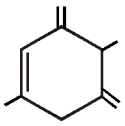
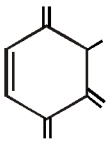
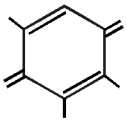
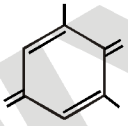
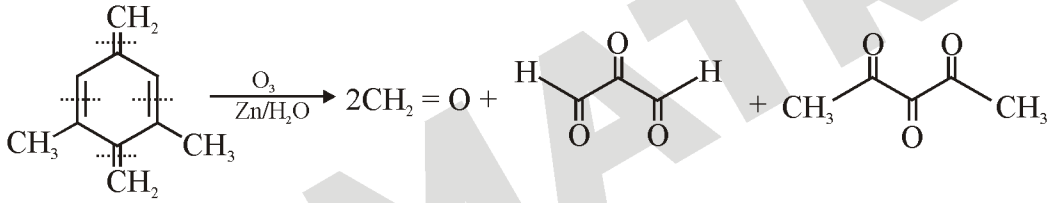
(1) 

(2) 

(3) 

(4) 

Ans. (4)

Sol. 

Question ID : 695278290

65. Match the LIST-I with LIST-II

List-I	List-II
Name of reaction	Reagent or catalyst used
A. Finkelstein reaction	I. SbF_3
B. Swarts reaction	II. Na , dry ether
C. Sandmeyer's reaction	III. NaI
D. Fittig reaction	IV. Cu_2Cl_2

Choose the correct answer from the options given below:

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

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

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

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

Ans. (2)

Sol. Reagent

Finkelstein Rxⁿ : NaI / Acetone

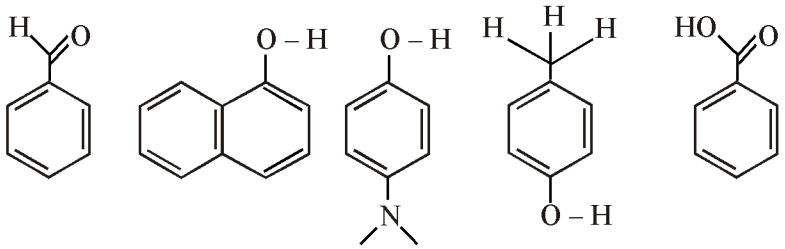
Swarts Rx^n : SbF_3

Sandmeyer Rx^n : Cu_2Cl_2

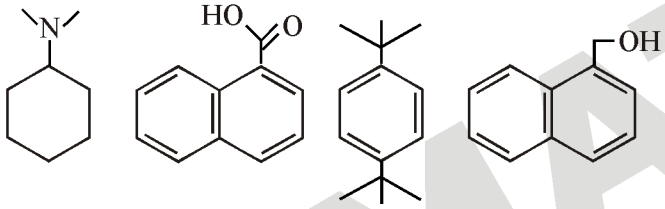
Fitting Rx^n : Na/dry ether

Question ID : 695278291

66. Amongst the following, the total number of compounds soluble in aqueous NaOH at room temperature is:



(I) (II) (III) (IV) (V)



(VI) (VII) (VIII) (IX)

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

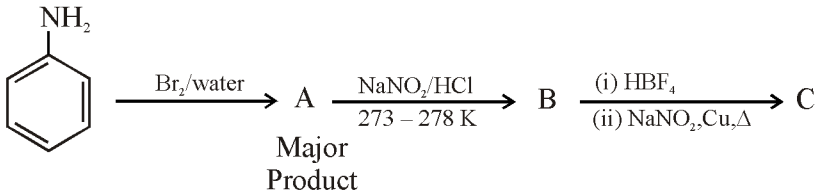
Ans. (1)

Sol. Compound soluble in aqueous NaOH

I, III, IV, V, VIII

Question ID : 695278292

67. Product C of the following reaction sequence will be



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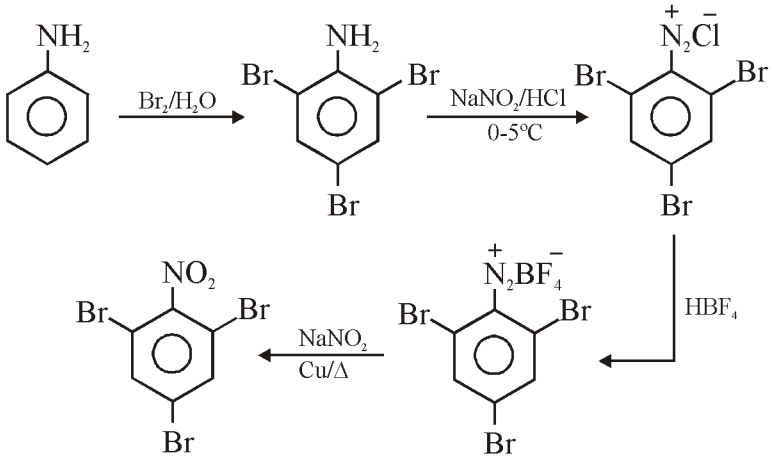
(1) 1-Bromo-4-nitrobenzene (2) 1, 3, 5-Tribromo-2-nitrobenzene

(3) 4-Bromo-1-nitrobenzene (4) 1, 3, 5-Tribromobenzene

Ans. (2)

Sol.

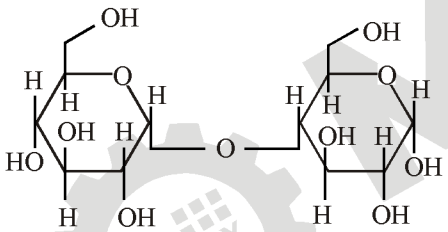


1,3,5-Tribromo-2-nitrobenzene

Question ID : 695278293

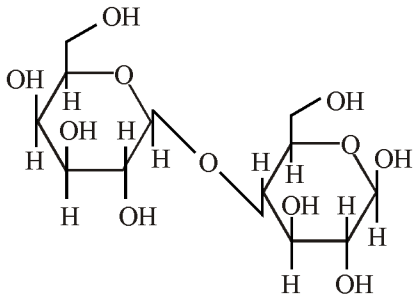
68. Given below are two statements:

Statement I : The structure of Maltose is given below:



Maltose is a non-reducing sugar.

Statement II : The structure of Lactose is given below:



Lactose is a reducing sugar.

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)

Sol. Maltose and lactose both have anomeric OH group so both are reducing sugar.

Question ID : 695278294

69. Match the LIST-I with LIST-II

List-I	List-II
Name of amino acid	One letter symbol/type
A. Arginine	I. D/Non-essential
B. Aspartic acid	II. R/Essential
C. Lysine	III. E/Non-essential
D. Glutamic acid	IV. K/Essential

Choose the correct answer from the options given below :

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

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

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

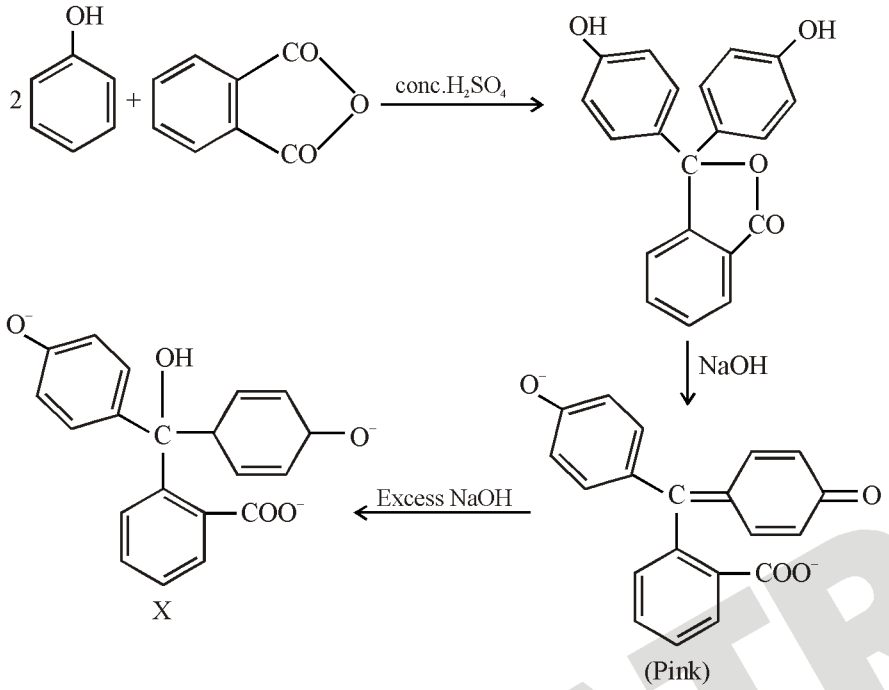
(4) A-II, B-IV, C-I, D-III

Ans. (1)

Sol. Arginine (R) and Lysine (K) are essential amino acid on the other hand Aspartic acid (D) and Glutamic acid (E) are Non-essential amino acid.

Question ID : 695278295

70. Identify the colour of compound ' X ' in the sequence of the reaction.



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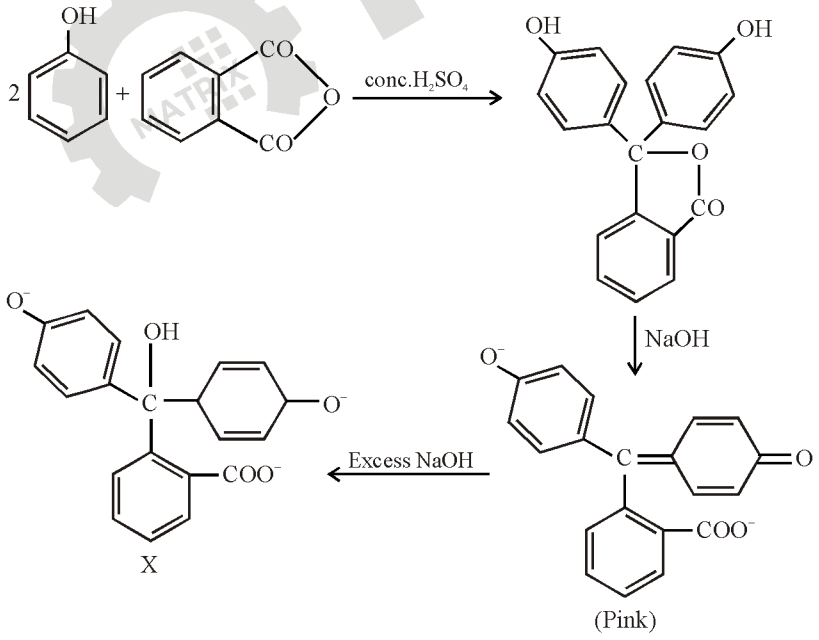
(1) Violet (2) Green (3) Red (4) Colourless

Ans. (4)

Sol.



(colourless)

SECTION – B

Question ID : 695278296

71. According to Lewis theory, the total number of σ bond-pairs and lone pair of electrons around the central atom of XeO_6^{4-} ion is _____ .

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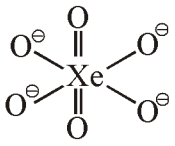
Ans. (6)

Sol. σ bond pair + lone pair = 6 + 0 = 6

$XeO_6^{-4} \Rightarrow$ Xe = sp^3d^2 hybridized.

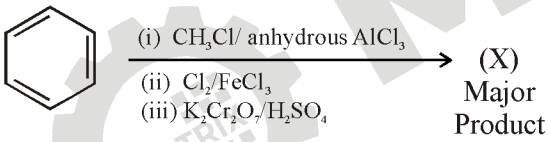
bond pair = 6[σ bonds]

lone pair = 0



Question ID : 695278297

72. Consider the following sequence of reactions to give the major product (X)



Pg of the major product (X) formed is reacted with $NaHCO_3$ solution to liberate a gas which occupied 11.2 dm^3 at STP.

P = _____ g.

(Given molar mass in $gmol^{-1}$ H : 1, C : 12, O : 16, Cl : 35.5)

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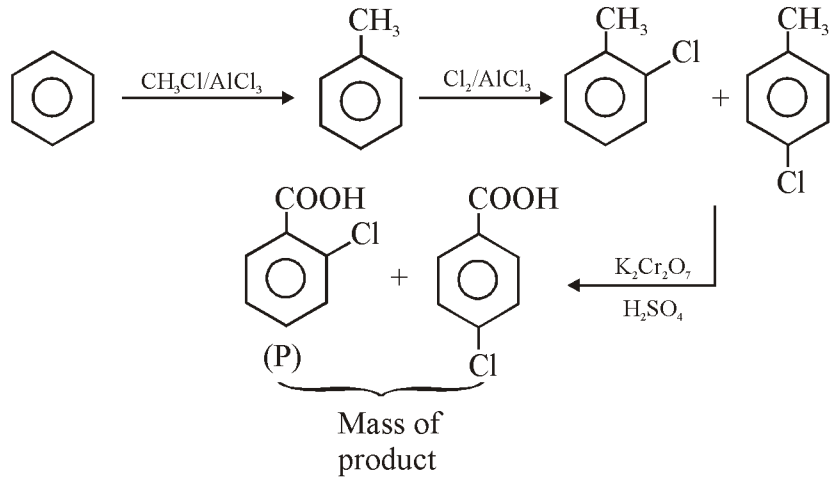
Ans. (78)

Sol.



$$\text{No.of P} = \frac{11.2}{22.4} = 0.5\text{mole}$$

$$M_{C_7H_5O_2Cl} = 156.5\text{gm}$$

$$W_{P(C_7H_5O_2Cl)} = 156.5 \times 2 = 78.25$$

Question ID : 695278298

73. 2.0 g of a bromo hydrocarbon (X) was subjected to Carius analysis, gave 3.36 g of AgBr . The percentage of carbon in the compound (X) is 26.7 %. Total number of carbon atoms in the empirical formula for compound (X) is _____ .

(Given molar mass in gmol^{-1} H : 1, C : 12, Br : 80, Ag : 108)

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Ans. (5)

Sol. $n_{Br} = \frac{3.36}{(108+80)}$

r = no. of Br atoms in organic compound

$$n_{\text{organic compound}} = \frac{3.36}{(108+80)\times x} = \frac{2}{M}$$

$$M = \frac{2 \times 188 \times x}{3.36}$$

$$M = \frac{1}{2} \times x$$

(x is integer)

$$W_C = \frac{112 \times x \times 26.7}{100} = 30 \times x$$

$$n_C = \frac{30 \times x}{12} = 2.5 \times x$$

take x = 2, $n_c = 5$

Question ID : 695278299

74. The pH of a solution obtained by mixing 5 mL of 0.1 M NH_4OH solution with 250 mL of 0.1 M NH_4Cl solution is _____ $\times 10^{-2}$.(Nearest integer)

Given: $pK_b\left(NH_4OH\right) = 4.74$

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Ans. (756)

Sol. On mixing final volume = 255 ml

$$[NH_3] = \frac{5 \times 0.1}{255}$$

$$[NH_4Cl] = \frac{250 \times 0.1}{255}$$

$$pOH = pK_b + \log \frac{[NH_4Cl]}{[NH_3]}$$

pOH = 6.44

pH = 14 –6.44 = 7.56

Question ID : 695278300

75. A non-volatile, non-electrolyte solid solute when dissolved in 40 g of a solvent, the vapour pressure of the solvent decreased from 760 mm Hg to 750 mm Hg . If the same solution boils at 320 K , then the number of moles of the solvent present in the solution is _____ . (Nearest integer)

[Given: boiling point of the pure solvent = 319.5 K, K_b of the solvent $= 0.3\,K\,kg\,mol^{-1}$]

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Ans. (5)

Sol. $$\frac{P^\circ - Ps}{Ps} = i.molality \times \frac{(M.solvent)}{1000}$$

$$\Delta T_b = i.K_b.\ molality \Rightarrow molality = \frac{0.5}{0.3}$$

$$\text{(Molecular Mass)} = \frac{600}{75}\text{g}$$

$$\text{Moles} = \frac{40}{600/75} = 5$$