

NEET 2021

12th September

Chemistry Video Solution & Discussion



MATRIX

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

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46. Given below are two statements:

Statement I : Aspirin and Paracetamol belong to the class of narcotic analgesics.

Statement II : Morphine and Heroin are non-narcotic analgesics.

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

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

Answer (4)

47. Zr ($Z=40$) and Hf ($Z=72$) have similar atomic and ionic radii because of :

- (1) Lanthanoid contraction (2) Having similar chemical properties
(3) Belonging to same group (4) Diagonal relationship

Answer (1)

48. The correct sequence of bond enthalpy of 'C-X' bond is

- (1) $\text{CH}_3\text{-F} < \text{CH}_3\text{-Cl} < \text{CH}_3\text{-Br} < \text{CH}_3\text{-I}$ (2) $\text{CH}_3\text{-F} > \text{CH}_3\text{-Cl} > \text{CH}_3\text{-Br} > \text{CH}_3\text{-I}$
(3) $\text{CH}_3\text{Cl} < \text{CH}_3\text{-F} < \text{CH}_3\text{-Br} < \text{CH}_3\text{I}$ (4) $\text{CH}_3\text{-Cl} > \text{CH}_3\text{-F} > \text{CH}_3\text{-Br} > \text{CH}_3\text{-I}$

Answer (2)

49. Ethylene diaminetetraacetate (EDTA) ion is :

- (1) Bidentate ligand with two "N" donor atoms
(2) Tridentate ligand with three "N" donor atoms
(3) Hexadentate ligand with four "O" and two "N" donor atoms
(4) Unidentate ligand

Answer (3)

50. BF_3 is planar and electron deficient compound. Hybridization and number of electrons around the central atom, respectively are:

- (1) sp^2 and 6 (2) sp^2 and 8 (3) sp^3 and 4 (4) sp^3 and 6

Answer (1)

51. A particular station of All India Radio, New Delhi, broadcasts on a frequency of 1,368 kHz (kilohertz). The wavelength of the electromagnetic radiation emitted by the transmitter is :

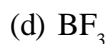
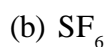
[speed of light $c = 3.0 \times 10^8 \text{ ms}^{-1}$]

- (1) 2192 m (2) 21.92 m (3) 219.3 m (4) 219.2 cm

Answer (3)



52. Match List - I with List - II.

List - I**List - II**

(i) Square pyramidal

(ii) Trigonal planer

(iii) Octahedral

(iv) Trigonal bipyramidal

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

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

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

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

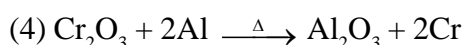
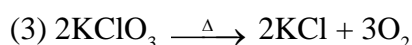
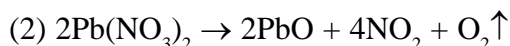
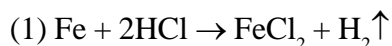
(4) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

Answer (3)

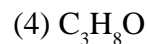
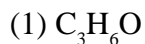
53. Dihedral angle of least stable conformer of ethane is :

(1) 60° (2) 0° (3) 120° (4) 180° **Answer (2)**

54. Which of the following reactions is the metal displacement reaction ? Choose the **right** option.

**Answer (4)**

55. The compound which shows metamerism is :

**Answer (2)**

56. Which one among the following is the **correct** option for right relationship between C_p and C_v for one mole of ideal gas ?

(1) $C_p = RC_v$

(2) $C_v = RC_p$

(3) $C_p + C_v = R$

(4) $C_p - C_v = R$

Answer (4)

57. Which one of the following polymers is prepared by addition polymerisation ?

(1) Novolac

(2) Dacron

(3) Teflon

(4) Nylon-66

Answer (3)

58. The right option for the statement "Tyndall effect is exhibited by", is :

(1) Starch solution

(2) Urea solution

(3) NaCl solution

(4) Glucose solution

Answer (1)

59. The **correct** option for the number of body centred unit cells in all 14 types of Bravais lattice unit cells is :

(1) 2

(2) 3

(3) 7

(4) 5

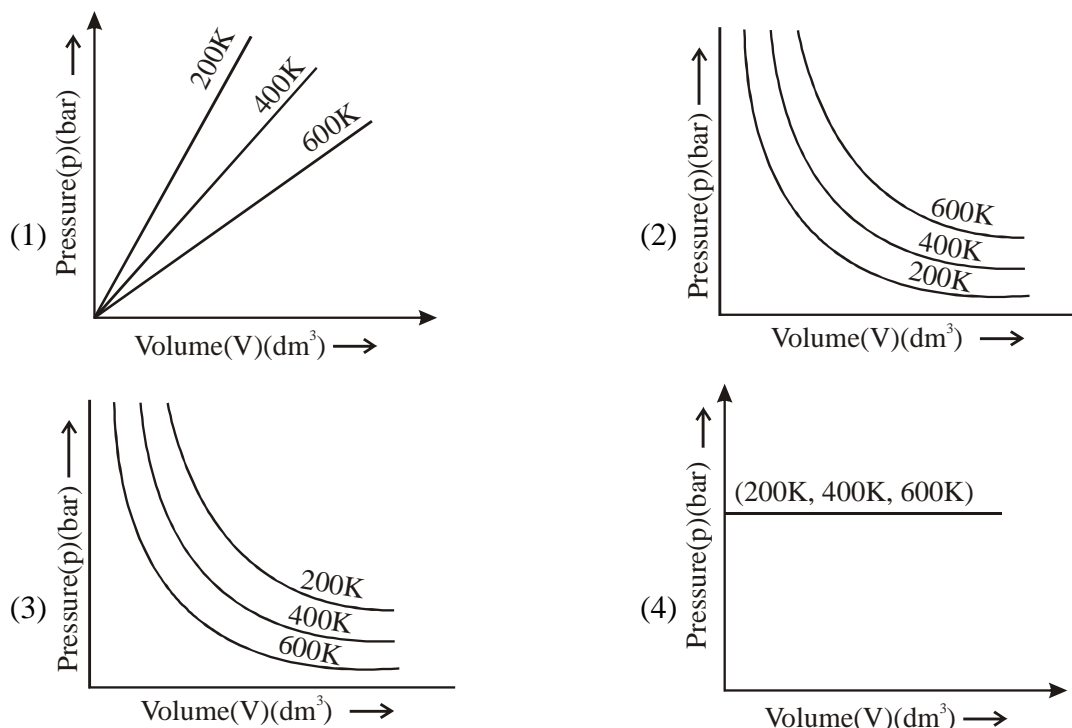
Answer (2)**MATRIX NEET DIVISION**

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60. Choose the **correct** option for graphical representation of Boyle's law, which shows a graph of pressure vs. volume of a gas at different temperatures:



Answer (2)

61. Noble gases are named because of their inertness towards reactivity. Identify an **incorrect** statement about them.
- (1) Noble gases have weak dispersion forces.
 - (2) Noble gases have large positive values of electron gain enthalpy.
 - (3) Noble gases are sparingly soluble in water.
 - (4) Noble gases have very high melting and boiling points.

Answer (4)

62. Which one of the following methods can be used to obtain highly pure metal which is liquid at room temperature?
- (1) Distillation (2) Zone refining (3) Electrolysis (4) Chromatography

Answer (1)

63. Tritium, a radioactive isotope of hydrogen, emits which of the following particles ?
- (1) Gamma (γ) (2) Neutron (n) (3) Beta (β^-) (4) Alpha (α)

Answer (3)

64. Among the following alkaline earth metal halides, one which is covalent and soluble in organic solvents is:
- (1) Magnesium chloride (2) Beryllium chloride (3) Calcium chloride (4) Strontium chloride

Answer (2)

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65. The pK_b of dimethylamine and pK_a of acetic acid are 3.27 and 4.77 respectively at T (K). The **correct** option for the pH of dimethylammonium acetate solution is:

- (1) 7.75 (2) 6.25 (3) 8.50 (4) 5.50

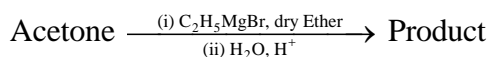
Answer (1)

66. The molar conductance of NaCl, HCl and CH_3COONa at infinite dilution are 126.45, 426.16 and $91.0 \text{ S cm}^2 \text{ mol}^{-1}$ respectively. The molar conductance of CH_3COOH at infinite dilution is. Choose the right option for your answer.

- (1) $698.28 \text{ S cm}^2 \text{ mol}^{-1}$ (2) $540.48 \text{ S cm}^2 \text{ mol}^{-1}$
(3) $201.28 \text{ S cm}^2 \text{ mol}^{-1}$ (4) $390.71 \text{ S cm}^2 \text{ mol}^{-1}$

Answer (4)

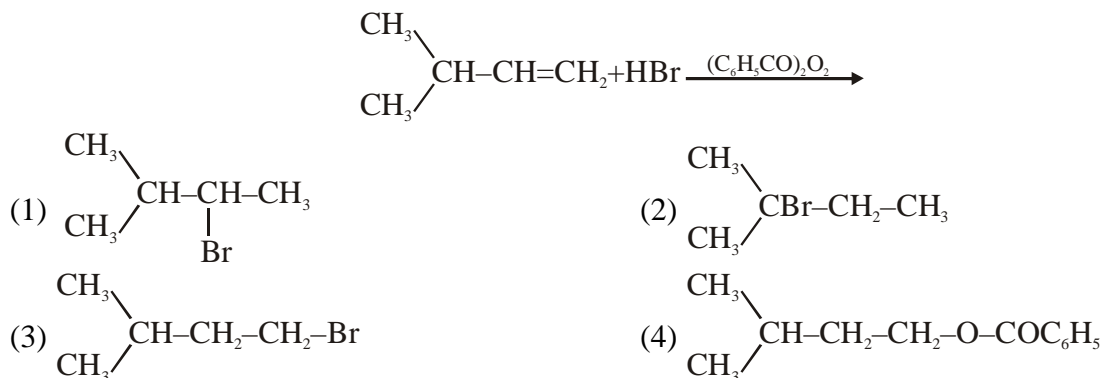
67. What is the IUPAC name of the organic compound formed in the following chemical reaction ?



- (1) pentan-3-ol (2) 2-methyl butan-2-ol
(3) 2-methyl propan-2-ol (4) pentan-2-ol

Answer (2)

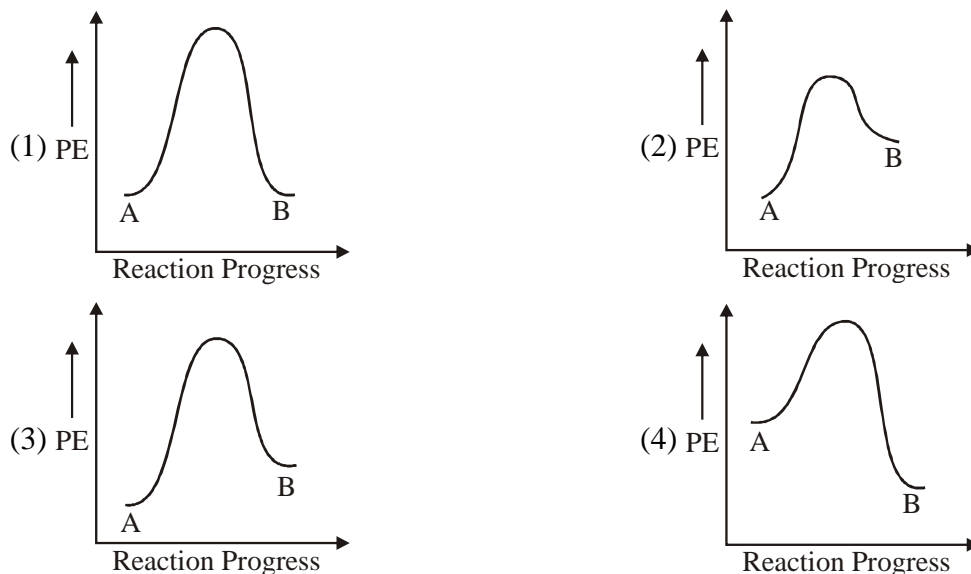
68. The major product of the following chemical reaction is :



Answer (3)

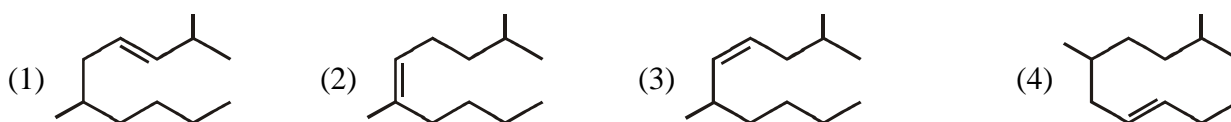


69. For a reaction $A \rightarrow B$, enthalpy of reaction is -4.2 kJ mol^{-1} and enthalpy of activation is 9.6 kJ mol^{-1} . The **correct** potential energy profile for the reaction is shown in option.



Answer (4)

70. The **correct** structure of 2,6-Dimethyl-dec-4-ene is:



Answer (3)

71. **Statement I** : Acid strength increases in the order given as $\text{HF} \ll \text{HCl} \ll \text{HBr} \ll \text{HI}$.

Statement II : As the size of the elements F, Cl, Br, I increases down the group, the bond strength of HF, HCl, HBr and HI decreases and so the acid strength increases.

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

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

Answer (3)

72. The major product formed in dehydrohalogenation reaction of 2-Bromo pentane is Pent-2-ene. This product formation is based on ?

- (1) Hoffmann Rule (2) Huckel's Rule (3) Saytzeff's Rule (4) Hund's Rule

Answer (3)



73. An organic compound contains 78% (by wt.) carbon and remaining percentage of hydrogen. The **right** option for the empirical formula of this compound is

[Atomic wt. of C is 12, H is 1]

- (1) CH_3 (2) CH_4 (3) CH (4) CH_2

Answer (1)

74. The RBC deficiency is deficiency disease of:

- (1) Vitamin B_1 (2) Vitamin B_2 (3) Vitamin B_{12} (4) Vitamin B_6

Answer (3)

75. The maximum temperature that can be achieved in blast furnace is :

- (1) upto 1900 K (2) upto 5000 K (3) upto 1200 K (4) upto 2200 K

Answer (4)

76. The **incorrect** statement among the following is :

- (1) Lanthanoids are good conductors of heat and electricity.
(2) Actinoids are highly reactive metals, especially when finely divided.
(3) Actinoid contraction is greater for element to element than Lanthanoid contraction.
(4) Most of the trivalent Lanthanoid ions are colorless in the solid state.

Answer (4)

77. The structures of beryllium chloride in solid state and vapour phase, are:

- (1) Dimer and Linear, respectively (2) Chain in both
(3) Chain and dimer, respectively (4) Linear in both

Answer (3)

78. Right option for the number of tetrahedral and octahedral voids in hexagonal primitive unit cell are:

- (1) 2, 1 (2) 12, 6 (3) 8, 4 (4) 6, 12

Answer (2)

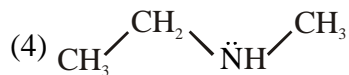
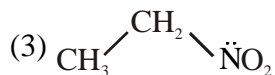
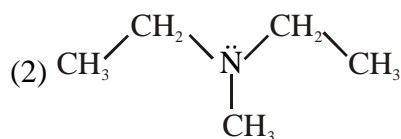
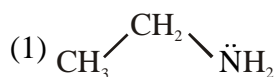
79. The following solutions were prepared by dissolving 10 g of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) in 250 ml of water (P_1), 10 g of urea ($\text{CH}_4\text{N}_2\text{O}$) in 250 ml of water (P_2) and 10 g of sucrose ($\text{C}_{12}\text{H}_{22}\text{O}_{11}$) in 250 ml of water (P_3). The **right** option for the decreasing order of osmotic pressure of these solutions is :

- (1) $\text{P}_2 > \text{P}_3 > \text{P}_1$ (2) $\text{P}_3 > \text{P}_1 > \text{P}_2$ (3) $\text{P}_2 > \text{P}_1 > \text{P}_3$ (4) $\text{P}_1 > \text{P}_2 > \text{P}_3$

Answer (3)



80. Identify the compound that will react with Hinsberg's reagent to give a solid which dissolves in alkali :



Answer (1)

81. The **correct** option for the value of vapour pressure of a solution at 45°C with benzene to octane in molar ratio 3 : 2 is :

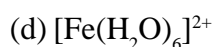
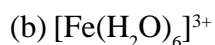
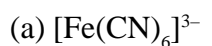
[At 45°C vapour pressure of benzene is 280 mm Hg and that of octane is 420 mm Hg. Assume Ideal gas]

- (1) 336 mm of Hg (2) 350 mm of Hg (3) 160 mm of Hg (4) 168 mm of Hg

Answer (1)

82. Match List-I with List-II

List-I



List-II

(i) 5.92 BM

(ii) 0 BM

(iii) 4.90 BM

(iv) 1.73 BM

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

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

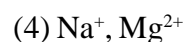
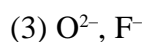
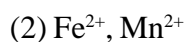
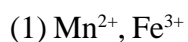
(2) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

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

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

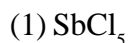
Answer (2)

83. From the following pairs of ions which one is **not** an iso-electronic pair ?



Answer (2)

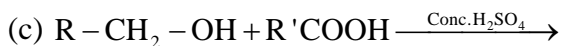
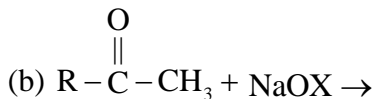
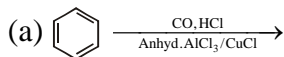
84. Which of the following molecules is non-polar in nature ?



Answer (1)



85. Match List-I with List-II.

List-I**List-II**

(i) Hell-Volhard-Zelinsky reaction

(ii) Gattermann-Koch reaction

(iii) Haloform reaction

(iv) Esterification

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

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

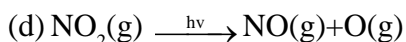
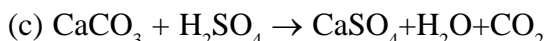
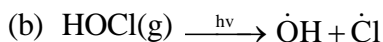
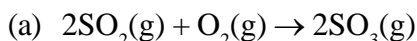
(2) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

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

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

Answer (2)

86. Match List-I with List-II :

List-I**List-II**

(i) Acid rain

(ii) Smog

(iii) Ozone depletion

(iv) Tropospheric pollution

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)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

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

Answer (1)

87. The slope of Arrhenius Plot $\left(\ln k_v / s \frac{1}{T} \right)$ of first order reaction is $-5 \times 10^3 \text{ K}$. The value of E_a of the reaction is. Choose the **correct** option for your answer.

[Given $R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$](1) 166 kJ mol^{-1} (2) -83 kJ mol^{-1} (3) 41.5 kJ mol^{-1} (4) 83.0 kJ mol^{-1} **Answer (3)**88. For irreversible expansion of an ideal gas under isothermal condition, the **correct** option is :(1) $\Delta U = 0, \Delta S_{\text{total}} \neq 0$ (2) $\Delta U \neq 0, \Delta S_{\text{total}} = 0$ (3) $\Delta U = 0, \Delta S_{\text{total}} = 0$ (4) $\Delta U \neq 0, \Delta S_{\text{total}} \neq 0$ **Answer (1)**

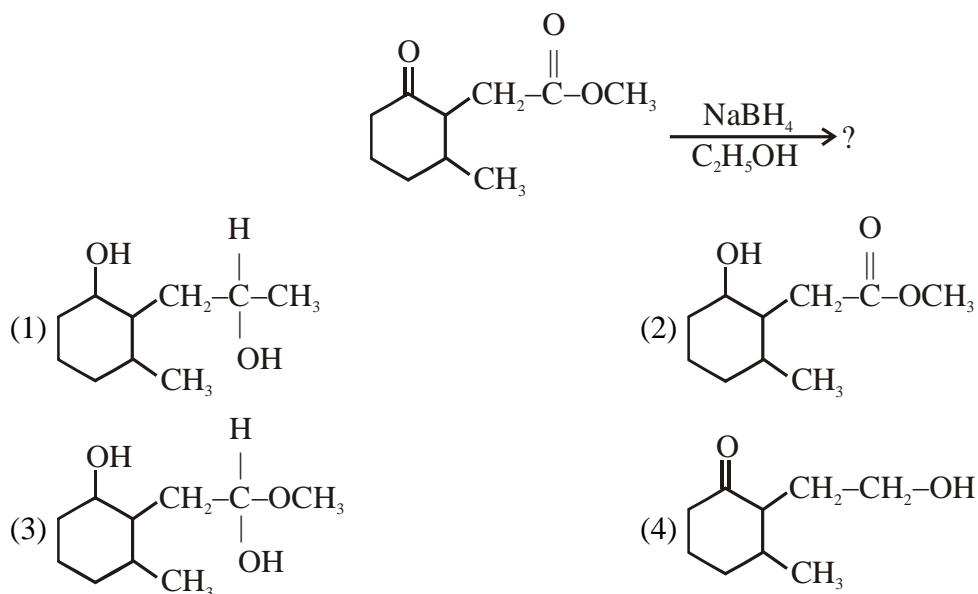


89. In which one of the following arrangements the given sequence is **not** strictly according to the properties indicated against it ?

- (1) $\text{NH}_3 < \text{PH}_3 < \text{AsH}_3 < \text{SbH}_3$: Increasing acidic character
(2) $\text{CO}_2 < \text{SiO}_2 < \text{SnO}_2 < \text{PbO}_2$: Increasing oxidizing power
(3) $\text{HF} < \text{HCl} < \text{HBr} < \text{HI}$: Increasing acidic strength
(4) $\text{H}_2\text{O} < \text{H}_2\text{S} < \text{H}_2\text{Se} < \text{H}_2\text{Te}$: Increasing pK_a values

Answer (4)

90. The product formed in the following chemical reaction is



Answer (2)

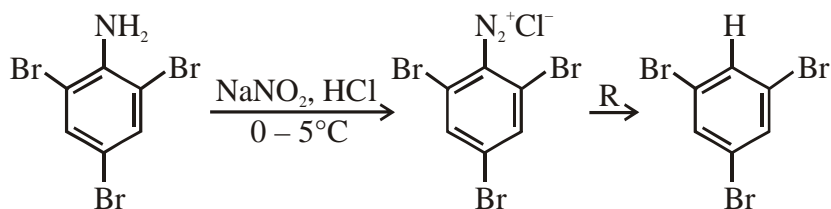
91. Choose the **correct** option for the total pressure (in atm.) in a mixture of 4 g O_2 and 2 g H_2 confined in a total volume of one litre at 0°C is:

[Given $R = 0.082 \text{ L atm mol}^{-1}\text{K}^{-1}$, $T = 273\text{K}$]

- (1) 25.18 (2) 26.02 (3) 2.518 (4) 2.602

Answer (1)

92. The reagent 'R' in the given sequence of chemical reaction is :



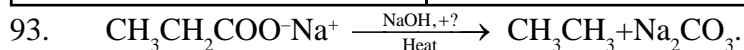
- (1) HI (2) CuCN/KCN (3) H_2O (4) $\text{CH}_3\text{CH}_2\text{OH}$

Answer (4)

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Consider the above reaction and identify the missing reagent/chemical.

(1) CaO

(2) DIBAL-H

(3) B_2H_6

(4) Red Phosphorus

Answer (1)

94. The molar conductivity of 0.007 M acetic acid is $20 \text{ S cm}^2 \text{ mol}^{-1}$. What is the dissociation constant of acetic acid? Choose the **correct** option.

$$\left[\begin{array}{l} \Lambda_{\text{H}^+}^\circ = 350 \text{ S cm}^2 \text{ mol}^{-1} \\ \Lambda_{\text{CH}_3\text{COO}^-}^\circ = 50 \text{ S cm}^2 \text{ mol}^{-1} \end{array} \right]$$

(1) $1.75 \times 10^{-5} \text{ mol L}^{-1}$

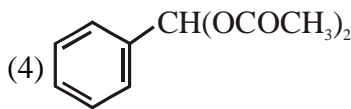
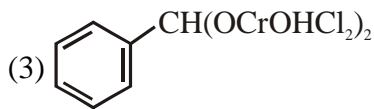
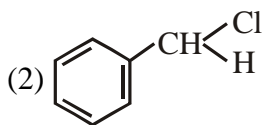
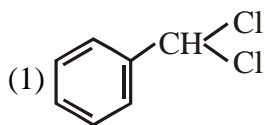
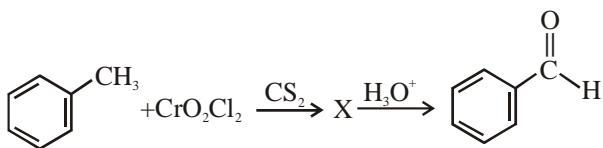
(2) $2.50 \times 10^{-5} \text{ mol L}^{-1}$

(3) $1.75 \times 10^{-4} \text{ mol L}^{-1}$

(4) $2.50 \times 10^{-4} \text{ mol L}^{-1}$

Answer (1)

95. The intermediate compound 'X' in the following chemical reaction is :



Answer (3)