CHEMISTRY

BOOKS - KALYANI CHEMISTRY (ENGLISH)

QUESTION PAPER 2022 TERM 1

Multiple Choice Question

1. In a sodium chloride crystal, how many chloride ions are there around sodium ion?

A. 3

B. 4

C. 6

D. 8

Answer:

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2. According to which law the solubility of a gas at equilibrium and constant temperature varies directly with the pressure of the gas,

provided the gas does not undergo any chemical change during the dissolution?

A. Raoult's Law

B. Nernst distribution Law

C. Henry's Law

D. van't Hoff Law

Answer:

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3. Which of the following statements is true for electrochemical cell?

A. Cations move towards zinc electrode

B. Cations move towards copper electrode

C. Current flows from zinc electrode to copper electrode

D. Electrons flow from copper electrode to zinc electrode

Answer:

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4. In extraction of copper from its sulphide ore, the metal is obtained by reduction of Cu_2O with:

A. Cuprous sulphide (Cu_2S)

B. Iron sulphide (FeS)

C. Sulphur dioxide (SO_2)

D. Carbon monoxide (CO)

Answer:

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5. If chlorine gas is passed through hot and conc. aqueous sodium hydroxide solution, the products formed have chlorine in different oxidation states. These oxidation states are indicated as:

A. -1 and +5

B. -1 and +3

C. -1 and +1

D. $+1$ and +5

Answer:

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6. When ethyl chloride is heated with alcoholic AgCN, the main product formed is:

A. Ethyl isocyanide

B. Ethyl cyanide

C. Ethyl nitrate

D. Ethyl amine

Answer:

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7. When phenol is treated with excess of bromine water, a white precipitate is formed. The compound formed is:

A. m-bromophenol

B. o and p-bromophenol

C. 3,5 dibromophenol

D. 2,4,6 tribromophenol

Answer:

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8. The ratio of number of atoms present in a face centred cubic, body centred cubic and simple cubic structure are respectively:

A. $1:2:4$

B. $4:2:1$

C. $8:1:6$

D. $4:2:3$

Answer:

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9. Electrochemical equivalent is the amount of substance which gets deposited from its solution on passing electrical charge equal to :

A. 96,500 coulombs

B. 9650 coulombs

C. 965 coulombs

D. 1 coulomb

Answer:

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10. A solution containing components A and B follows Raoult's Law.

With reference to the statement which of the following options is correct?

A. A-B attraction force is greater than A-A and B-B

B. A-B attraction force is less than A-A and B-B

C. A-B attraction force remains the same as A-A and B-B

D. Total volume of solution is different from sum of volumes of both

components A and B

Answer:

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11. What is used in the blast furnace to obtain iron from haematite ore?

A. Electrolytic reduction

B. Carbon dioxide

C. Carbon monoxide

D. Aluminium

Answer:

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12. Copper metal on treatment with conc. nitric acid (HNO_3) gives:

A. $Cu(NO_3)_2 + CuO + H_2O$

B. $Cu(NO_3)_2 + NO + H_2O$

C. $Cu(NO_3)_2 + NO_2 + H_2O$

D. $Cu(NO_3)_2 + H_2SO_4 + H_2O$

Answer:

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13. Haloform reaction DOES NOT take place with which of the following compounds:

A. Propanone

B. 2-propanol

C. Ethanol

D. Methanol

Answer:

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14. A solid has a structure in which 'Y' atoms are located at the corners of a cubic lattice, 'O' atoms at the centre of edges and 'K' atoms at the centre of the cube. What is the formula of this compound?

A. KYO_2

B. KYO_3

C. K_2YO_3

D. K_4YO_3

Answer:

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15. Formaldehyde when reacts with CH_3MgI forms an additional product, which on hydrolysis gives:

A. Ethyl iodide

B. Methyl alcohol

C. Methyl iodide

D. Ethyl alcohol

Answer:

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16. A solution of urea (molecular mass = 60) contains 8.6 g per litre. It is isotonic with a 5% solution of a non-volatile and non-electrolytic

solute. What will be the molecular mass of the solute?

A. $34.9 g\ mol^{-1}$

B. $349 g\ mol^{-1}$

C. $861 g\ mol^{-1}$

D. $3490 g\ mol^{-1}$

Answer:

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17. The standard reduction electrode potential of Cu^{2+}/Cu is +0.34 V and that of Cr^{3+}/Cr is -0.74 V. These two electrodes are connected in their standard state to make an electrochemical cell. What will be the standard electrode potential (E°) of this cell?

A. 1.19 V

B. 1.08 V

C. 0.69 V

D. 1.83 V

Answer:

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18. In compounds XeF_2, XeF_4 and XeF_6 , the number of lone pair(s) on Xe atom respectively is :

A. $2, 3, 1$

B. $1, 2, 3$

C. $4, 1, 2$

D. $3, 2, 1$

Answer:

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19. The value of molal depression constant or cryoscopic constant (Kl) depends on which of the following?

A. Nature of solvent.

B. Heat of the solution of the solute in the solvent

C. Nature of solute.

D. Vapour pressure of the

Answer:

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20. Anti-Markownikoff addition of HBr is NOT observed in which of the following alkenes?

A. Propene

B. But-1-ene

C. But-2-ene

D. Pent-1-ene

Answer:

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21. When phenol is treated with zinc dust, it gives:

A. Benzoic acid

B. Benzaldehyde

C. Benzene

D. Toluene

Answer:

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22. The appearance of colour in solid alkali metal halides is generally due to

A. Schottky defect

B. Frenkel defect

C. Interstitial positions

D. F-centres

Answer:

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23. The ionic conductance at infinite dilution for Ba^{2+} and Cl^{-} ions are $127 \text{ohm}^{-1} cm^{-1} \text{mol}^2$ and $76 \text{ohm}^{-1} cm^{-1} \text{mol}^2$ respectively. What will be the molar conductance of $BaCl_2$ at infinite dilution?

A. $139.5 \text{ohm}^{-1} cm^2 \text{mol}^{-1}$

B. $279.0 \text{ohm}^{-1} cm^2 \text{mol}^{-1}$

C. $203.0 \text{ohm}^{-1} cm^2 \text{mol}^{-1}$

D. $101.5 \text{ohm}^{-1} cm^2 \text{mol}^{-1}$

Answer:

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24. When excess of ethanol is heated with conc. H_2SO_4 at 413K, which compound is obtained?

A. Diethyl sulphate

B. Ethyl hydrogen sulphate

C. Ethoxy ethane

D. Ethene

Answer:

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25. With reference to the extraction of metal, answer the following:

What is the process of removing impurity from crude metal called?

A. Roasting

B. Calcination

C. Refining

D. Concentration

Answer:

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26. With reference to the extraction of metal, answer the following:

Which of the following is not a method for the concentration of ores?

A. Froth floatation

B. Smelting

C. Magnetic separation

D. Gravity separation

Answer:

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27. An alkyl halide reacts with metallic sodium in the presence of dry ether.

What is this reaction known as?

A. Frankland's reaction

B. Sandmeyer's reaction

C. Wurtz reaction

D. Kolbe's reaction

Answer:

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28. An alkyl halide reacts with metallic sodium in the presence of dry ether.

An organic compound 'A' on reaction with sodium metal in dry ether gives a hydrocarbon, 2, 2, 3, 3 tetramethyl butane. Identify compound 'A'.

A. tert-butyl chloride

B. sec-butyl chloride

C. iso-butyl chloride

D. n-butyl chloride

Answer:

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29. Answer the following questions with reference to the extraction of copper from its ore.

Which one of the following is the sulphide ore?

A. Cuprite

B. Malachite

C. Azurite

D. Chalcopyrite

Answer:

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30. Answer the following questions with reference to the extraction of copper from its ore.

In the Bessemer converter, copper sulphide is

reduced to copper by which one of the following reaction?

A. $CuS + FeO \rightarrow 2Cu + FeO + S$

B. $CuS + FeS \rightarrow 2Cu + FeS_2$

C. $CuS + 2Cu_2O \rightarrow 6Cu + SO_2$

D. $CuS + Fe \rightarrow 2Cu + FeS$

Answer:

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31. Cholorobenzene is fused with aqueous sodium hydroxide at 623K and 300 atm followed by hydrolysis with dil. HCI.

The organic product formed is:

A. Phenol

B. Sodium phenoxide

C. Benzene

D. Cyclohexyl chloride

Answer:

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32. Cholorobenzene is fused with aqueous sodium hydroxide at 623K and 300 atm followed by hydrolysis with dil. HCI.

What is the name of the above reaction?

A. Williamson's synthesis

B. Dow's process

C. Rosenmund's reduction

D. Kolbe's reaction

Answer:

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33. BrF_5 molecule is an interhalogen compound.

What is the structure of the given molecule?

A. Pentagonal bipyramidal

B. Square pyramidal

C. Square planar

D. Tetrahedral

Answer:

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34. BrF_5 molecule is an interhalogen compound.

What is the type of hybridisation shown by central atom of the above molecule?

A. sp^3

B. sp

C. sp^3d^2

D. sp^3d^3

Answer:

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35. When ethene reacts with HBr, a compound (X) is formed. When compound (X) reacts with sodium ethoxide then compound (Y) is formed along with sodium bromide.

Identify the compound (X)?

A. C_2H_6

B. C_2H_5Br

C. CH_3Br

D. $C_2H_4Br_2$

Answer:

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36. When ethene reacts with HBr, a compound (X) is formed. When compound (X) reacts with sodium ethoxide then compound (Y) is formed

along with sodium bromide.

Identify the compound (Y)?

A. CH_3OH

B. C_2H_5OH

C. CH_3OCH_3

D. $C_2H_5OC_2H_5$

Answer:

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37. Extraction of silver metal is done mainly from argentite (Ag_2S) ore:

The concentrated ore on treatment with dil. NaCN solution and then followed by continuous agitation for several hours, which of the following products are obtained?

A. AgCN and Na_2S

B. Ag and NaCN

C. Na_2SO_4 and Na_2SO_3

D. $Na\left[Ag(CN)_2\right]$ and Na_2S

Answer:

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38. Extraction of silver metal is done mainly from argentite (Ag_2S) ore:

What is the above process of extraction of silver using dilute sodium cyanide known as ?

A. Deacon's process

B. Pattinson's process

C. Mac-Arthur-Forrest cyanide process

D. Parke's process

Answer:

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39. Silver acetate is refluxed with bromine in carbon tetrachloride.

What are the products formed?

A. Ethane, silver bromide and water

B. Ethanoyl bromide and silver

C. Ethanoic acid and silver bromide

D. Bromomethane, silver bromide and carbon dioxide

Answer:

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40. With reference to $XeOF_4$ molecule, answer the following questions:

What is the type of hybridisation of Xe atom in the given molecule?

A. sp^3d

B. sp^3d^2

C. sp^3d^3

D. sp^3

Answer:

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41. With reference to $XeOF_4$ molecule, answer the following questions:

What is the geometry of this molecule?

A. Octahedral

B. Square pyramidal

C. Square planar

D. Tetrahedral

Answer:

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42. Phenol and ethyl alcohol can be distinguished by a single chemical test.

Which of the following is the reagent used to distinguish phenol from ethyl alcohol?

A. Solid PCl_5

B. Dry sodium metal

C. Neutral $FeCl_3$

D. Acetyl chloride in presence of pyridine

Answer:

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43. Phenol and ethyl alcohol can be distinguished by a single chemical test.

Which colour is developed in the solution due to the addition of the above reagent to phenol?

A. Blue

B. Green

C. Red

D. Violet

Answer:

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44. Ozone is an allotropic form of oxygen. It acts as a powerful oxidizing agent.

During the oxidation of mercury (Hg) by ozone, the sub oxide (Hg_2O) formed dissolves in mercury causing it to lose its meniscus and starts sticking to the sides of glass. What is this phenomenon called?

A. Branching of mercury

B. Tailing of mercury

C. Breaking of meniscus

D. Distorted meniscus

Answer:

45. Ozone is an allotropic form of oxygen. It acts as a powerful oxidizing agent.

Which one of the following compounds is formed when Ozone reacts with black lead sulphide?

A. Blue coloured lead trioxide

B. White coloured lead sulphate

C. Green coloured lead oxide

D. Red coloured tri lead tetroxide

Answer:

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46. An element 'X' having atomic mass 60 has density 6.23 g/cm^2. The edge length of its cubic unit cell is 400 pm.

$\left(N_A = 6.023 \times 10^{23} \text{mol}^{-1}\right)$

What is this type of unit cell known as?

A. Body centred cubic

B. Face centred cubic

C. Simple cubic

D. Side centred cubic

Answer:

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47. An element 'X' having atomic mass 60 has density 6.23 $\mathrm{g/cm^2}$. The edge length of its cubic unit cell is 400 pm. $\left(N_A = 6.023 \times 10^{23} \mathrm{mol}^{-1}\right)$

What is the radius of an atom of this element?

A. 210.5 pm

B. 346.4 pm

C. 141.4 pm

D. 115.3 pm

Answer:

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48. 0.76g of glucose (molecular mass $= 180\text{g mol}^{-1}$) is dissolved in 20 ml of aqueous solution at 298K. $\left(R = 0.0821\text{Lit-atm}K^{-1}\text{mol}^{-1}\right)$.

What is the osmotic pressure of solution at 298K?

A. 8.41 atm

B. 0.48 atm

C. 4.81 atm

D. 5.16 atm

Answer:

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49. 0.76g of glucose (molecular mass $= 180\text{g mol}^{-1}$) is dissolved in 20 ml of aqueous solution at 298K. $\left(R = 0.0821\text{Lit-atm}K^{-1}\text{mol}^{-1}\right)$.

What is the molarity of the glucose solution?

A. 0.42 M

B. 0.21 M

C. 4.01 M

D. 2.02 M

Answer:

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50. A conductivity cell is filled with 0.05 M NaOH solution offerin If the cell constant of the cell is $0.367 \mathrm{cm}^{-1}$, calculate the following .

The value of specific conductance:

A. $1.29 \times 10^{-2} \Omega^{-1} cm^{-1}$

B. $1.29 \times 10^{-3} \Omega^{-1} cm^{-1}$

C. $1.16 \times 10^{-2} \Omega^{-1} cm^{-1}$

D. $11.6 \times 10^{-2} \Omega^{-1} cm^{-1}$

Answer:

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51. A conductivity cell is filled with 0.05 M NaOH solution offerin If the cell constant of

the cell is 0.367cm^{-1}, calculate the following .

The value of molar conductance:

A. $232.20\Omega^{-1}cm^2\text{mol}^{-1}$

B. $23.22\Omega^{-1}cm^2\text{mol}^{-1}$

C. $119.07\Omega^{-1}cm^2\text{mol}^{-1}$

D. $165.36\Omega^{-1}cm^2\text{mol}^{-1}$

Answer:

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52. The radius of silver atom is 143.5 pm and it crystallises in face centred cubic arrangement. (molecular mass of $Ag = 107.87, N_A = 6.023 \times 10^{23}$)

What is the edge length of the unit cell?

A. 405.8 pm

B. 40.6 pm

C. 331.4 pm

D. 287.0 pm

Answer:

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53. The radius of silver atom is 143.5 pm and it crystallises in face centred cubic arrangement. (molecular mass of $Ag = 107.87, N_A = 6.023 \times 10^{23}$)

What the density of silver metal?

A. $5.6 g/cm^3$

B. $8.60 g/cm^3$

C. $10.72 g/cm^3$

D. $7.07 \mathrm{g} / \mathrm{cm}^3$

Answer:

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54. A solution contains 54g of glucose (molecular mass = $180 \mathrm{g} \mathrm{mol}^{-1}$) in 250g of water (K_f for water $= 1.86 \mathrm{K} \mathrm{kg} \mathrm{mol}^{-1}$). What will be the freezing point of this glucose solution?

A. 276.402 K

B. 270.768 K

C. 370.402 K

D. 272.563 K

Answer:

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55. A solution contains 54g of glucose (molecular mass = 180g mol^{-1}) in 250g of water (K_f for water $= 1.86\text{K kg mol}^{-1}$).

What will be the molality of this glucose solution?

A. 1.20 m

B. 0.12 m

C. $2.40m$

D. $0.24m$

Answer:

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56. The standard reduction electrode potential for Sn^{4+}/Sn^{2+} couple is +0.15V and that for the Cr^{3+}/Cr couple is -0.74V. These two couples in their standard state are connected to make a cell. (1 Faraday = 96,500 C mol^{-1}). What will be the value of E° cell?

A. $+1.19V$

B. $+0.89V$

C. $+0.18V$

D. $+1.83V$

Answer:

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57. The standard reduction electrode potential for Sn^{4+}/Sn^{2+} couple is +0.15V and that for the Cr^{3+}/Cr couple is -0.74V. These two couples in their standard state are connected to make a cell. (1 Faraday = 96,500 C mol^{-1}). What will be the value of standard Gibbs energy (ΔG°)?

A. $-650.3kJ$

B. $-515.3kJ$

C. $-226.4kJ$

D. $-406.8kJ$

Answer:

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58. Niobium crystallises in body centred cubic structure. Its density is 8.55g cm^3 atomic mass

is $93 g \mathrm{mol}^{-1}\left(N_A = 6.023 \times 10^{23}\right)$

What is the edge length of Niobium?

A. 314.50 pm

B. 330.56 pm

C. 340.43 pm

D. 346.30 pm

Answer:

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59. Niobium crystallises in body centred cubic structure. Its density is 8.55g cm^3 atomic mass is $93 g \text{mol}^{-1} \left(N_A = 6.023 \times 10^{23}\right)$

What is the atomic radius of Niobium?

A. 136 pm

B. 140 pm

C. 143 pm

D. 149 pm

Answer:

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60. 5 moles of sucrose (molecular mass = 342g mol^{-1}) dissolved in 1000g of water (molecular mass = 18g mol^{-1}). Vapour pressure of pure water at 298K = 4:57 mm Hg. What will be the vapour pressure of sucrose solution at the same temperature?

A. 0.419 mm Hg

B. 6.570 mm Hg

C. 4.190 mm Hg

D. 0.657 mm Hg

Answer:

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61. 5 moles of sucrose (molecular mass = 342g mol^{-1}) dissolved in 1000g of water (molecular mass = 18g mol^{-1}). Vapour pressure of pure water at 298K = 4:57 mm Hg. What will be the mole fraction of sucrose in water?

A. 0.8261

B. 0.0826

C. 0.4376

D. 0.0435

Answer:

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62. A solution containing 2g of anhydrous barium chloride in $400 cm^3$ of water has a specific conductivity of $0.0058 \mathrm{S\ cm^{-1}}$ (at. wt.

of Ba= 137, Cl = 35.5)

What is the molarity of the above solution?

A. 0.204 M

B. 0.024 M

C. 0.420 M

D. 4.021 M

Answer:

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63. A solution containing 2g of anhydrous barium chloride in $400cm^3$ of water has a specific conductivity of $0.0058\mathrm{S\ cm^{-1}}$ (at. wt. of Ba= 137, Cl = 35.5)

What is the molar conductivity of the above solution?

A. $241.67\mathrm{S\ cm^2}$ /mol

B. $261.47\mathrm{S\ cm^2}$ /mol

C. $247.17\mathrm{S\ cm^2}$ /mol

D. $361.47\mathrm{S\ cm^2}$ /mol

Answer:

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64. Assertion (A) Nitration of chlorobenzene leads to the formation of m-nitrochlorobenzene.

Reason (R) $-NO_2$ group is a m-directing group.

A. Both assertion and reason are true and reason is the correct explanation of the

assertion.

B. Both assertion and reason are true but reason is not the correct explanation of the assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer:

65. Assertion: Copper obtained after bessemerisation is known as blister copper.

Reason: Blisters are produced on the surface of the metal due to escaping of sulphur dioxide gas during cooling.

A. Both assertion and reason are true and reason is the correct explanation of the assertion.

B. Both assertion and reason are true but reason is not the correct explanation of

the assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer:

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66. Assertion: Phenol reacts with neutral ferric chloride $(FeCl_3)$ and gives violet colour solution.

Reason: The violet colour solution is due to

the formation of $\left[Fe(OC_6H_5)_6\right]^{3-}$ complex ion.

A. Both assertion and reason are true and reason is the correct explanation of the assertion.

B. Both assertion and reason are true but reason is not the correct explanation of the assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer:

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67. Assertion: Interhalogen compounds are more reactive than constituent halogens.

Reason: Bond between two different halogens is stronger than the bond between two similar halogen atoms.

A. Both assertion and reason are true and reason is the correct explanation of the

assertion.

B. Both assertion and reason are true but reason is not the correct explanation of the assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer:

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68. Assertion: The minerals from which the metals are conveniently and economically extracted are called ores.

Reason: All the metals can be extracted from their ores by one method.

A. Both assertion and reason are true and reason is the correct explanation of the assertion.

B. Both assertion and reason are true but reason is not the correct explanation of

the assertion

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer:

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Question

1. Acetyl chloride on heating with diethyl ether in the presence of anhydrous $ZnCl_2$ gives:

A. Ethyl alcohol and acetic aicd

B. Methyl chloride and methyl alcohol

C. Methyl acetate and methyl alcohol

D. Ethyl acetate and ethyl chloride

Answer:

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