CHEMISTRY

BOOKS - KALYANI CHEMISTRY (ENGLISH)

CHEMISTRY-2017

Question

1. Fill in the blanks by choosing the appropriate word/words from those given in the brackets :

(iodoform, acetaldehyde, positive, greater, acidic, acetone, disaccharide, negative, increases, glucose, decreases, chloroform, polysaccharide, lactose, lesser,

basic, cationic hydrolysis, anionic hydrolysis)

(i) Calcium acetate on heating gives_____which gives _____on heating with iodine and sodium hydroxide solution.

(ii) On dilution of a solution, its specific conductance while its equivalent conductance_____

(iii) Sucrose is a _____ and yields upon hydrolysis, a mixture of _____ and fructose.

(iv) More _____ is the standard reduction potential of a substance, the _____ is its ability to displace hydrogen from acids.

(v) An aqueous solution of CH_3COONa is _____ due to _____.

Watch Video Solution

2. Fill in the blanks by choosing the appropriate word/words from those given in the brackets :

(iodoform, acetaldehyde, positive, greater, acidic, acetone, disaccharide, negative, increases, glucose, decreases, chloroform, polysaccharide, lactose, lesser, basic, cationic hydrolysis, anionic hydrolysis)

(i) Calcium acetate on heating gives_____which gives _____on heating with iodine and sodium hydroxide solution.

(ii) On dilution of a solution, its specific conductance while its equivalent conductance_____

(iii) Sucrose is a _____ and yields upon hydrolysis, a mixture of _____ and fructose.

(iv) More _____ is the standard reduction potential of a

substance, the _____ is its ability to displace hydrogen from acids.

(v) An aqueous solution of CH_3COONa is _____ due to _____.

Watch Video Solution

3. Fill in the blanks by choosing the appropriate word/words from those given in the brackets :

(iodoform, acetaldehyde, positive, greater, acidic, acetone, disaccharide, negative, increases, glucose, decreases, chloroform, polysaccharide, lactose, lesser, basic, cationic hydrolysis, anionic hydrolysis)

(i) Calcium acetate on heating gives_____which gives _____on heating with iodine and sodium hydroxide

solution.

(ii) On dilution of a solution, its specific conductance while its equivalent conductance_____

(iii) Sucrose is a _____ and yields upon hydrolysis, a mixture of _____ and fructose.

(iv) More _____ is the standard reduction potential of a substance, the _____ is its ability to displace hydrogen from acids.

(v) An aqueous solution of CH_3COONa is _____ due to _____.

Watch Video Solution

4. Fill in the blanks by choosing the appropriate word/words from those given in the brackets :

(iodoform, acetaldehyde, positive, greater, acidic, acetone, disaccharide, negative, increases, glucose, decreases, chloroform, polysaccharide, lactose, lesser, basic, cationic hydrolysis, anionic hydrolysis)

(i) Calcium acetate on heating gives_____which gives _____on heating with iodine and sodium hydroxide solution.

(ii) On dilution of a solution, its specific conductance while its equivalent conductance_____

(iii) Sucrose is a _____ and yields upon hydrolysis, a mixture of _____ and fructose.

(iv) More _____ is the standard reduction potential of a substance, the _____ is its ability to displace hydrogen from acids.

(v) An aqueous solution of CH_3COONa is _____ due to _____.

Watch Video Solution

5. Fill in the blanks by choosing the appropriate word/words from those given in the brackets :

(iodoform, acetaldehyde, positive, greater, acidic, acetone, disaccharide, negative, increases, glucose, decreases, chloroform, polysaccharide, lactose, lesser, basic, cationic hydrolysis, anionic hydrolysis)

(i) Calcium acetate on heating gives_____which gives _____on heating with iodine and sodium hydroxide solution.

(ii) On dilution of a solution, its specific conductance

while its equivalent conductance_____

(iii) Sucrose is a _____ and yields upon hydrolysis, a mixture of _____ and fructose.

(iv) More _____ is the standard reduction potential of a substance, the _____ is its ability to displace hydrogen from acids.

(v) An aqueous solution of CH_3COONa is _____ due to _____.

Watch Video Solution

6. In a face centered cubic arrangement of A and B atoms whose A atoms are at the corner of the unit cell and B atoms at the face centers. One of the B atoms

missing from one of the face in unit cell. The simplest formula of compounding is:

A. A_2B_5

B. A_2B_3

C. AB_2

D. A_2B

Answer: A

Watch Video Solution

7. The half-life period of a first order reaction is 20 minutes. The time required for the concentration of the reactant to change from 0.16 M to 0.02 M is :

A. 80 minutes

B. 60 minutes

C. 40 minutes

D. 20 minutes

Answer: B

Watch Video Solution

8. For a spontaneous reaction, ΔG, equilibrium constant K and E°_{cell} will be respectively

A. $-ve$ and +ve

B. $+ve$ and -ve

C. $+ve$ and +ve

D. $-ve$ and -ve

Answer: A

Watch Video Solution

9. The conjugate acid of HPO_4^{2-} is:

A. H_3PO_3

B. H_3PO_4

C. $H_2PO_4^-$

D. PO_4^{3-}

Answer: C

Watch Video Solution

10. The polymer formed by the condensation of hexamethylenediamine and adipic acid is :

A. Teflon

B. Bakelite

C. Dacron

D. Nylon-66

Answer: D

Watch Video Solution

11. Match the following:

(i) Diazotisation	(a) Bakelite
(ii) Argentite	(b) Nernst equation
(iii) Thermosetting plastics	(c) Aniline
(iv) Electrochemical cell	(d) Ethylenediamine
(v) Bidentate ligand	(e) Froth floatation process

Watch Video Solution

12. Determine the freezing point of a solution containing 0.625 g of glucose ($C_6H_{12}O_6$) dissolved in 102.8 g of water.

(Freezing point of water = 273 K, K_l for water = 1.87 K kg mol^{-1} at. wt. C = 12, H = 1, O = 16)

Watch Video Solution

13. A 0.15 M aqueous solution of KCl exerts an osmotic pressure of 6.8 atm at 310 K. Calculate the degree of dissociation of KCl. (R = 0.0821 Lit. atm $K^{-1}mol^{-1}$).

Watch Video Solution

14. A solution containing 8.44 g of sucrose in 100 g of water has a vapour pressure 4.56 mm of Hg at 273K. If the vapour pressure of pure water is 4.58 mm of Hg at the same temperature, calculate the molecular weight of sucrose.

Watch Video Solution

15. When ammonium chloride and ammonium hydroxide are added to a solution containing both Al^{3+} and Ca^{2+} ions, which ion is precipitated first and why ?

Watch Video Solution

16. A solution of potassium chloride has no effect on litmus whereas, a solution of zinc chloride turns the blue litmus red. Give a reason.

Watch Video Solution

17. How many sodium ions and chloride ions are present in a unit cell of sodium chloride ?

Watch Video Solution

18. Lead sulphide has face centred cubic crystal structure. If the edge length of the unit cell of lead sulphide is 495 pm, calculate the density of the crystal. (at. Wt. Pb =207, S=32)

Watch Video Solution

19. For the reaction :

$2H_2 + 2NO \Leftrightarrow 2H_2O + N_2$, the following rate data was obtained :

S. No.	[NO] mol L^{-1}	[H_2] mol L^{-1}	Rate : mol L^{-1} sec^{-1}
1.	0·40	0·40	$4·6 \times 10^{-3}$
2.	0·80	0·40	$18·4 \times 10^{-3}$
3.	0·40	0·80	$9·2 \times 10^{-3}$

Calculate the following:

(1) The overall order of reaction.

(2) The rate law.

(3) The value of rate constant (k).

Watch Video Solution

20. The following electrochemical cell is set up at 298 K:

$Zn/Zn^{2+}(aq)(1M)\ ||\ Cu^{2+}(aq)(1M)/Cu$

Given:

$E^{\circ}Zn^{2+}/Zn = -0.761V, E^{\circ}Cu^{2+}/Cu = +0.339V$

(1) Write the cell reaction.

(2) Calculate the emf and free energy change at 298 K

Watch Video Solution

21. Frenkel defect does not change the density of the ionic crystal whereas, Schottky defect lowers the density of ionic crystal. Give a reason.

Watch Video Solution

22. Name the law or principle to which the following observations conform :

(1) When water is added to a 1.0 M aqueous solution of

acetic acid, the number of hydrogen ion (H^+) increases.

(2) When 9650 coulombs of electricity is passed through a solution of copper sulphate, 3.175 g of copper is deposited on the cathode.(at. wt. of Cu = 63.5).

(3) When ammonium chloride is added to a solution of ammonium hydroxide, the concentration of hydroxyl ions decreases.

Watch Video Solution

23. Name the law or principle to which the following observations conform :

(1) When water is added to a 1.0 M aqueous solution of acetic acid, the number of hydrogen ion (H^+) increases.

(2) When 9650 coulombs of electricity is passed through

a solution of copper sulphate, 3.175 g of copper is deposited on the cathode.(at. wt. of Cu = 63.5).

(3) When ammonium chloride is added to a solution of ammonium hydroxide, the concentration of hydroxyl ions decreases.

Watch Video Solution

24. Name the law or principle to which the following observations conform :

(1) When water is added to a 1.0 M aqueous solution of acetic acid, the number of hydrogen ion (H^+) increases.

(2) When 9650 coulombs of electricity is passed through a solution of copper sulphate, 3.175 g of copper is deposited on the cathode.(at. wt. of Cu = 63.5).

(3) When ammonium chloride is added to a solution of ammonium hydroxide, the concentration of hydroxyl ions decreases.

Watch Video Solution

25. What is the difference between the order of a reaction and its molecularity ?

Watch Video Solution

26. Explain why high pressure is required in" the manufacture of sulphur trioxide by contact process. State the law or principle used.

Watch Video Solution

27. Calculate the equilibrium constant (Kc) for the formation of NH_3 in the following reactions.

$N_2(g) + 3H_2(g) \Leftrightarrow 2NH_3(g)$

At equilibrium, the concentration of NH_3, H_2 and N_2 are 1.2×10^{-2}, 3.0×10^{-2} and 1.5×10^{-2} respectivley.

Watch Video Solution

28. Explain the following: Hydrolysis of ester (ethyl acetate) begins slowly but becomes fast after sometime.

Watch Video Solution

29. Explain the following :

The pH value of acetic acid increases on addition of a few drops of sodium acetate.

Watch Video Solution

30. Write the formula of the following compounds :

(i) Potassium trioxalatoaluminate (III)

(ii) Hexaaquairon (II) sulphate.

Watch Video Solution

31. Write the formula of the following compounds :

(i) Potassium trioxalatoaluminate (III)

(ii) Hexaaquairon (II) sulphate.

Watch Video Solution

32. Name the types of isomerism shown by the following pairs of compounds :

$[Cu(NH_3)_4][Pt(Cl_4)]$ and $[Pt(NH_3)_4][CuCl_4]$

Watch Video Solution

33. Name the types of isomerism shown by the following pairs of compounds :

$[Co(Pn)_2Cl_2]^+$ and $[Co(tn)_2Cl_2]^+$

Watch Video Solution

34. For the coordination complex ion $[Co(NH_3)_6]^{3+}$

Give the IUPAC name of the complex ion.

Watch Video Solution

35. For the coordination complex ion $[Co(NH_3)_6]^{3+}$.

What is the oxidation number of cobalt in the complex ion?

Watch Video Solution

36. For the complex ion of $\left[Co(NH_3)_6\right]^{3+}$

State the hybridization of the complex.

Watch Video Solution

37. For the complex ion of $\left[Co(NH_3)_6\right]^{3+}$:

State the magnetic nature of the complex.

Watch Video Solution

38. Give balanced equation for the following reactions:

(i) Potassium permanganate is heated with concentrated hydrochloric acid.

(ii) Potassium dichromate is treated with acidified

ferrous sulphate solution.

(iii) Hydrogen peroxide is treated with acidified $KMnO_4$ solution.

Watch Video Solution

39. Give balanced equations for the following reactions :

(i) Potassium permanganate is heated with concentrated hydrochloric acid.

(ii) Lead sulphide is heated with hydrogen peroxide.

(iii) Ozone is treated with potassium iodide solution.

Watch Video Solution

40. Give balanced equations for the following reactions :

(i) Potassium permanganate is heated with concentrated hydrochloric acid.

(ii) Lead sulphide is heated with hydrogen peroxide.

(iii) Ozone is treated with potassium iodide solution.

Watch Video Solution

41. Discuss the theory involved in the manufacture of sulphuric acid by contact process.

Watch Video Solution

42. (i) What are the types of hybridization of iodine in interhalogen compounds IF_3, IF_3 and IF_7, respectively ?

(ii) Draw the structure of xenon hexafluoride (X_eF_6) molecule and state the hybridization of the central atom.

Watch Video Solution

43. (i) What are the types of hybridization of iodine in interhalogen compounds IF_3, IF_3 and IF_7, respectively ?

(ii) Draw the structure of xenon hexafluoride (X_eF_6)

molecule and state the hybridization of the central atom.

Watch Video Solution

44. Give the equations for the conversion of argentite (Ag_2S) to metallic silver.

Watch Video Solution

45. How can the following conversions be brought about :

Acetaldehyde to propan-2-ol.

Watch Video Solution

46. How can the following conversions be brought about

:

Nitrobenzene to p-aminoazobenzene.

Watch Video Solution

47. How can the following conversions be brought about

:

Acetic acid to methylamine.

Watch Video Solution

48. How can the following conversions be brought about :

Aniline to benzene.

Watch Video Solution

49. How will you distinguish between primary, secondary and tertiary amines ?

Watch Video Solution

50. Why do alcohols possess higher boiling points as compared to those of corresponding alkanes ?

Watch Video Solution

51. Identify the compounds A, B and C :

(i) $C_6H_5COOH \xrightarrow{PCl_5} A \xrightarrow{H_2-Pd/BaSO_4} B \xrightarrow[\text{distil}]{\text{KCN alc}} C$

(ii)

$$H-C\equiv C-H \xrightarrow[\text{dil } H_2SO_4+HgSO_4]{H_2O} A \xrightarrow[\text{Ni}]{H_2} B \xrightarrow[\text{conc}H_2SO_4]{140^\circ C} C$$

Watch Video Solution

52. Identify the compounds A, B and C :

(i) $C_6H_5COOH \xrightarrow{PCl_5} A \xrightarrow{H_2-Pd/BaSO_4} B \xrightarrow[\text{distil}]{\text{KCN alc}} C$

(ii)

$$H-C\equiv C-H \xrightarrow[\text{dil } H_2SO_4+HgSO_4]{H_2O} A \xrightarrow[\text{Ni}]{H_2} B \xrightarrow[\text{conc}H_2SO_4]{140^\circ C} C$$

Watch Video Solution

53. Give balanced equations for the following name reactions :

Friedel-Crafts reaction (alkylation)

Watch Video Solution

54. Give balanced equations for the following name reactions :

Williamson's synthesis.

Watch Video Solution

55. Give balanced equations for the following name reactions :

Aldol condensation.

Watch Video Solution

56. Give chemical test to distinguish : ethyl alcohol and sec - propyl alcohol.

Watch Video Solution

57. Give chemical test to distinguish :

Acetaldehyde and acetic acid.

Watch Video Solution

58. Deficiency of which vitamin causes the following diseases :

(1) Scurvy

(2) Night blindness.

Watch Video Solution

59. State two main differences between globular and fibrous proteins.

Watch Video Solution

60. An aliphatic unsaturated hydrocarbon (A) when treated with $HgSO_4 / H_2SO_4$ yields a compound (B) having molecular formula C_3H_6O. (B) on oxidation with concentrated HNO_3 gives two compounds (C) and (D). Compound (C) when treated with PCl_5 gives compound (E). (E) when reacts with ethanol gives a sweet smelling liquid (F). Compound (F) is also formed when (C) reacts with ethanol in the presence of concentrated H_2SO_4.

(i) Identify the compound A, B, C, D, E and F.

(ii) Give the chemical equation for the reaction of (C) with chlorine in the presence of red phosphorus and name the reaction.

Watch Video Solution

61. Give balanced equations for the following reactions :

(i) Methyl magnesium bromide with ethyl alcohol.

(ii) Acetic anhydride with phosphorous pentachloride.

(iii) Acetaldehyde with hydroxylamine.

Watch Video Solution

62. Give balanced equations for the following reactions :

(i) Methyl magnesium bromide with ethyl alcohol.

(ii) Acetic anhydride with phosphorous pentachloride.

(iii) Acetaldehyde with hydroxylamine.

Watch Video Solution

63. Give balanced equations for the following reactions :

(i) Methyl magnesium bromide with ethyl alcohol.

(ii) Acetic anhydride with phosphorous pentachloride.

(iii) Acetaldehyde with hydroxylamine.

Watch Video Solution

Question Answer The Following Questions

1. Answer the following questions :

Why the freezing point depression (ΔT_f) of 0.4M NaCl solution is nearly twice than that of 0.4M glucose solution ?

Watch Video Solution

2. What do you understand by the order of a reaction ? Identify the reaction order from each of the following units of the reaction rate constant :

(i) $L^{-1}mols^{-1}$

(ii) $Lmols^{-1}$

Watch Video Solution

3. Specific conductivity of 0.20 M solution of KCl at 298 K is $0.025Scm^{-1}$. Calculate its molar conductivity.

Watch Video Solution

4. Name the order of reaction which proceeds with a uniform rate throughout.

Watch Video Solution

5. What are the products formed when phenol and nitrobenzene are treated separately with a mixture of concentrated sulphuric acid and concentrated nitric acid ?

Watch Video Solution

Question Answer The Following

1. (ii) Answer the following:

(1) What is the effect of temperature on ionic product of water (Kw) ?

(2) What happens to the ionic product of water (Kw) if some acid is added to it ?

Watch Video Solution

2. (ii) Answer the following:

(1) What is the effect of temperature on ionic product of water (Kw) ?

(2) What happens to the ionic product of water (Kw) if some acid is added to it ?

Watch Video Solution

3. What is the common name of the polymer obtained by the polymerisation of caprolactum ? Is it addition polymer or condensation polymer ?

Watch Video Solution

4. Name the two organic compounds which have the same molecular formula C_2H_6O. Will they react with PCl_5? If they react, what are the products formed ?

Watch Video Solution