CHEMISTRY

BOOKS - KALYANI CHEMISTRY (ENGLISH)

SAMPLE QUESTION PAPER 3

Question

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

(vacant, square planar, tetrahedral, 64%, crystal, decreases, efficient, increases, 74%, sp^3d^2, sp^3)

The unit of conductance is ..... and that of specific conductance is ..... (ohm^{-1}, $ohm^{-1}cm^{-1}$)

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

(vacant, square planar, tetrahedral, 64%, crystal, decreases, efficient, increases, 74%, sp^3d^2, sp^3)

Noble gases have..... ionization enthalpy and more..... electron gain enthalpy. (high, positive)

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

(vacant, square planar, tetrahedral, 64%, crystal, decreases, efficient, increases, 74%, sp^3d^2, sp^3)

Electrons trapped in the ..... sites of the..... lattice are called F-centres.

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

(vacant, square planar, tetrahedral, 64%, crystal, glycol,glycerol, decreases, efficient, increases, 74%,

sp^3d^2, sp^3)

..... is an example of trihydric alcohol and..... is an example of dihydric alcohol.

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5. if two liquids A and B form minimum boiling azeotrope at some specific composition then ____

A. A-B interaction are stronger than those between A-A or B-B.

B. Vapour pressure of solution increases because more number of molecules of liquids A and B can escape from the solution.

C. Vapour pressure of solution decreases because less number of molecules of only one of the liquids escapes from the solution.

D. A-B interactions are weaker than those between A-A or B-B.

Answer:

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6. Extraction of gold and silber involves leaching the metal with CN^- ion. The metal is recovered by _____ .

A. Displacement of metal by some other metal from the complex ion.

B. Roasting of metal complex.

C. Calcination followed by roasting.

D. Thermal decomposition of metal complex

Answer:

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7. Complete the statement by selecting the correct alternative from the choices given:

Introducing a halogen atom into an alkene can generally reduce its

A. Polarity

B. Volatility

C. Flammability

D. Reactivity

Answer:

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8. The compound which is optically active is :

A. 1-butanol

B. 2-butanol

C. 1-propanol

D. 2-methyl-1-propanol

Answer:

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9. Match the following:

Column- A	Column- B
(i) Initial rate method	(i) Tollen's reagent
(ii) Shape selective catalysis	(ii) DNA
(iii) Ammoniacal Silver Nitrate	(iii) Zeolite
(iv) Purine	(iv) Concentration vs time

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10. Answer the question

Which of the following solutions will have a lower vapour pressure and why?

(1) A 5% solution of cane sugar $(C_{12}H_{22}O_{11})$

(2) A 5% solution of urea (NH_2CONH_2)

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11. Answer the question

Explain the following

(1) Why do transition metal ions possess a great tendency to form complexes?

(2) The paramagnetic character in 3d-transition series elements increases up to Mn and decreases.

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12. Answer the question

Write the IUPAC names of the following:

(1) $\left[Co(NH_3)_4SO_4\right]NO_3$

(2) $K[Pt(NH_3)Cl_3]$

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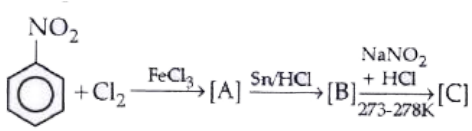
13. Answer the question

Complete the following reaction and name the

intermediate products A, B and C.



Name the following reaction and write balanced equation: Acetamide with bromine in the presence of potassium hydroxide.

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14. A first order reaction is 50% complete in 30 min at $27^\circ C$. Calculate the rate constant of the reaction at $27^\circ C$.

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15. Name a substance that can be used as an antiseptic as well as a disinfectant.

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16. What is tincture of iodine ?

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17. Draw a graph which is used to calculate the activation energy of a reaction. Give the appropriate expressions used to calculate the activation energy graphically.

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18. Haloalkanes undergo nucleophilic substitution whereas haloarenes undergo electrophilic substitution. Explain

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19. Write balanced chemical equation for the reaction and name the reaction: Benzaldehyde is treated with 50% sodium hydroxide solution.

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20. Give one example of a fibrous protein. Name the final product of hydrolysis of proteins. What is denaturation of proteins?

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21. Give balanced equations for the following reactions :

Sodium ethoxide is treated with ethyl bromide.

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22. Give balanced chemical equation for the following reaction :

Chlorine is passed through diethyl ether.

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

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24. The unit of rate and rate constant are same for a

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25. Conversion of Phenol into benzoic acid

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26. How will you bring about the conversion:

glycerol to formic acid.

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27. The osmotic pressure of 0.01 molar solution of an electrolyte is found to be 0.65 atm at $27^{\circ}C$. Calculate the van.t Hoff factor. What conclusion can you draw

about the molecular state of the solute in the solution?

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28. Iron has an edge length 288 pm. Its density is $7.86gm/cm^3$. Find the type of cubic lattice to which crystal belongs. (At. mass of iron = 56)

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29. Whate happens in the following activities and why?

(i) An electrolyte is added to a hydrated ferric oxide

sol in water.

(ii) A bean of light is passed through a colloidal solution.

(iii) An electric current is passed through a colloidal soluidal solution.

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30. Describe a conspicuous change observed when a solution of NaCl is added to a sol of hydrated ferric oxide.

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31. Whate happens in the following activities and why?

(i) An electrolyte is added to a hydrated ferric oxide sol in water.

(ii) A bean of light is passed through a colloidal solution.

(iii) An electric current is passed through a colloidal soluidal solution.

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32. A solution containing 0.5 g of KCI dissolved in 100 g of water and freezes at $-0.24^{\circ}C$. Calculate the

degree of dissociation of the salt. (K_f for water = $1.86^\circ C$. [Atomic weight K = 39, Cl = 35.5]

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33. Name the type of isomerism shown by the pair of co-ordination compounds:

$[Co(NH_3)_5NO_2]Cl_2$ and $[Co(NH_3)_5ONO]Cl_2$

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34. Name the type of isomerism shown by the pair of co-ordination compounds:

$[Cr(H_2O)_5Cl]Cl_2.H_2O$ and

$[Cr(H_2O)_4Cl_2]Cl.2H_2O$

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35. Which of the following is more stable complex and why ?

$[Co^{2+}(NH_3)_6]^{3+}$ and $[Co(en)_3]^{3+}$

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36. Balance the following equation by oxidation number method in acidic medium.

$Cr_2O_7^{2-} + Fe^{2+} + H^+ \rightarrow Cr^{3-} + Fe^{3+} + H_2O$

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37. Complete the following chemical equations :

(i) $Cr_2O_6^{2-} + 6Fe^{2+} + 14H^+ \rightarrow$

(ii) $2CrO_4^{2-} + 2H^+ \rightarrow$

(iii) $2MnO_4^- + 5C_2O_4^{2-} + 16H^+ \rightarrow$

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38. Complete the reaction:

$2MnO_4^- + 5C_2O_4^{2-} + 16H^+ \rightarrow$

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39. Write balanced equations of the following reactions:

Aniline and Bromine Water

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40. Write balanced equations of the following reactions:

Ethylamine and nitrous acid

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41. Write balanced equations of the reaction:

Acetic anhydride and ammonia

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42. (i) Name the element of 3d transition series which shows maximum number of oxidation states. Why does it show so ?

(ii) Complete the following equation : $MnO_4^- + 8H^+ + 5e^- \rightarrow$.

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43. Out of Cr^{3+} and Mn^{3+} , which is a stronger oxidising agent and why?

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44. Explain giving reasons: (i) Transition metals and many of their compounds show paramagnetic behaviour. (ii) The enthalpies of atomisation of the transition metals are high. (iii) The transition metals generally form coloured compounds. (iv) Transition metals and their many compounds act as good catalyst.

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45. Name the method used for the refining of Nickel metal.

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46. (a) Give an example of zone refining of metals.

(b) What is the role of cryolite in the metallurgy of aluminium?

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47. What is the role of limestone in the extraction of iron from its oxides?

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48. Calculate E_{cell} at $25^{\circ}C$ for the reaction :

$Zn + Cu^{2+}(0.20M) \rightarrow Zn^{2+}(0.50M) + Cu$

Given

$E^{\Theta}\left(Zn^{2+}/Zn\right) = -0.76V, E^{\Theta}\left(Cu^{2+}/Cu\right) = 0.34V$

.

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49. For the following cell, calculate the emf:

$Al / Al^{3+}(0.01M)||Fe^{2+}(0.02M)|Fe$

Given: $E^{\Theta}_{Al^{3+}/Al} = -1.66V, E^{\Theta}_{Fe^{2+}/Fe} = -0.44V$

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50. A reaction is first order in A and second order in B

(i) Write the differential rate equation.

(ii) How is the rate affected on increasing the concentation of B three times ?

(iii) How is the rate affected when the concentration of both A and B are doubled ?

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51. A reaction is first order in A and second order in B

(i) Write the differential rate equation.

(ii) How is the rate affected on increasing the concentation of B three times ?

(iii) How is the rate affected when the concentration of both A and B are doubled ?

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52. A reaction is first order in A and second order in B

(i) Write the differential rate equation.

(ii) How is the rate affected on increasing the concentation of B three times ?

(iii) How is the rate affected when the concentration of both A and B are doubled ?

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53. (a) Explain the following terms :

(i) Order of a reaction

(ii) Molecularity of a reaction

(b) The rate of a reaction increases four times when the temperature changes from 300 K to 320 K. Calculate the energy of activation of the reaction, assuming that it does not change with temperature. $\left(R = 8.314 JK^{-1} mol^{-1}\right)$

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54. (a) Draw the structures of the following :

(i) PCl_5(s)

(ii) SO_3^{2-}

Explain the following observations :

(i) Ammonia has a higher boiling point than phosphin.

(ii) Helium does not form any chemical compound.

(iii) Bi (V) is a stronger oxidising agent than Sb (V).

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55. Account for the follwing :

(i) $Bi(v)$ is a stronger oxidizing agent then Sb(v).

(ii) N-N single bond is weaker then P - P Single bond.

(iii) Noble gases have very low boiling points.

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56. Account for the follwing :

(i) $Bi(v)$ is a stronger oxidizing agent then Sb(v).

(ii) N-N single bond is weaker then P - P Single bond.

(iii) Noble gases have very low boiling points.

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57. Explain the hybridization in XeF_4. Also draw its molecular structure.

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58. Account for the following :

(i) PCl_5 is more covalent than PCl_3.

(ii) Iron on reaction with HCl forms $FeCl_2$ and not $FeCl_3$.

(iii) The two O-O bond lengths in the ozone molecule are equal.

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59. Account for the following :

(i) PCl_5 is more covalent than PCl_3.

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60. Account for the following :

(i) PCl_5 is more covalent than PCl_3.

(ii) Iron on reaction with HCl forms $FeCl_2$ and not $FeCl_3$.

(iii) The two O-O bond lengths in the ozone molecule are equal.

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61. Write balanced chemical equations for the reaction:

Chlorine is passed through hot concentrated NaOH solution.

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62. Write balanced chemical equations for the following reactions :

Sulphuric acid is treated with phosphorus.

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63. Give balanced equations for the following reactions :

Calcium acetate is subjected to dry distillation.

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64. Give balanced equations for the following reactions :

Benzaldehyde is treated with sodium bisulphite.

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65. Give balanced equation for the reaction:

Formaldehyde is treated with ammonia.

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66. Give one chemical test to distinguish between pair of compounds

Formic acid and acetic acid.

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67. Give one chemical test to distinguish between pair of compounds

Acetone and acetic acid.

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68. What is Cannizzaro reaction ? Name a compound which undergoes this reaction. Name the products formed when this compound undergoes the reaction.

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69. Give balanced equation for the name reaction: Benzoin condensation.

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70. Give balanced equation for the name reaction:

Rosenmund reaction.

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