



CHEMISTRY

BOOKS - KALYANI CHEMISTRY (ENGLISH)

CHEMISTRY-2018

Question

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

(square pyramidal, electrical, 74, 26, sp^3d^2 , sp^3d ,
chemical, 68, 32, tetrahedral, yellow, white, iodoform

Lucas)

A Galvanic cell converts _____ energy.



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

(square pyramidal, electrical, 74, 26, sp^3d^2 , sp^3d ,
chemical, 68, 32, tetrahedral, yellow, white, iodoform

Lucas)

The percentage of unoccupied spaces in bcc and fcc arrangements are _____ and _____ respectively.



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

(square pyramidal, electrical, 74, 26, sp^3d^2 , sp^3d , chemical, 68, 32, tetrahedral, yellow, white, iodoform Lucas)

Propan-2-ol on reaction with iodine and sodium hydroxide gives _____ precipitate and the reaction is called _____ test.



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

(square pyramidal, electrical, 74, 26, sp^3d^2 , sp^3d ,

chemical, 68, 32, tetrahedral, yellow, white, iodoform Lucas)

The geometry of $XeOF_4$ molecule is _____ and the hybridisation of xenon atom in the molecule is _____.



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5. Complete the following statements by selecting the correct alternative from the choices given :

During the course of an S_N1 reaction, the intermediate species formed is :

A. a carbocation

B. a free radical

C. a carbanion

D. an intermediate complex

Answer: A



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6. Complete the following statements by selecting the correct alternative from the choices given :

Purification of aluminium by electrolytic refining is called :

A. Serpeck's process

B. Hooppe's process

C. Hall's process

D. Baeyer's process

Answer: B



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

An aqueous solution of urea freezes at $-0.186^{\circ}C$, K_f for water = $1.86 \text{ K kg. mol}^{-1}$, K_b for water = $0.512 \text{ K kg mol}^{-1}$. The boiling point of urea solution will be :

A. 373.065 K

B. 375.186 K

C. 373.512 K

D. 373.0512 K

Answer: D



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8. Complete the following statements by selecting the correct alternative from the choices given :

In the dehydration of alcohols to alkenes by heating with concentrated sulphuric acid, the initiation step is :

A. formation of carbocation

B. formation of an ester

C. protonation of alcohol molecule

D. elimination of water

Answer: C



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9. Match the following:

(i) Rate constant

(a) Dialysis

(ii) Biodegradable polymer

(b) Glycine

(iii) Zwitter ion

(c) Arrhenius equation

(iv) Purification of colloids

(d) PHBV



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10. Write the rate law expression for the reaction $A + B + C \rightarrow D + E$, if the order of reaction is first second and zero with respect to A, B and C, respectively.



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11. How many times the rate of reaction will increase if the concentration of A, B and C are doubled in the equation in (i) above ?



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12. The rate of a reaction quadruples when the temperature changes from 293 K to 313 K. Calculate the

energy of activation of the reaction assuming that it does not change with temperature

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13. How do antiseptics differ from disinfectants ? Give one example of each.

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14. State the role of the following chemicals in the food industry:

(i) Sodium benzoate (ii) Aspartame

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15. An aromatic organic compound [A] on heating with NH_3 and Cu_2O at high pressure gives [B]. The compound [B] on treatment with ice cold solution of $NaNO_2$ and HCl gives [C], which on heating with Cu/HCl gives compound [A] again. Identify the compounds [A], [B] and [C]. Write the name of the reaction for the conversion of [B] to [C].



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16. write the names of the monomers of the following polymers:

(i) Polythene

(ii) Polyvinyl chloride

(iii) Bakelite



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17. Write the name and structures of the monomers of the following biodegradable polymers :

(i) Nylon 2-nylon 6

(ii) PHBV

(iii) PHB



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18. Name the purine bases and pyrimidine bases present in RNA and DNA.

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19. How will you obtain the following ? (Give balanced equation.)

Picric acid from phenol.

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20. How will you obtain the following ? (Give balanced equation.)

Ethyl chloride from diethyl ether.

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21. How will you obtain the following ? (Give balanced equation.)

Anisole from phenol

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22. How will you obtain the following ? (Give balanced equation.)

Ethyl acetate from ethanol.

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23. 40% of a first order reaction is completed in 50 minutes. How much time will it take for the completion of 80% of this reaction?



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24. The freezing point of a solution containing 5.85 g of NaCl in 100 g of water is $-3.348^{\circ}C$. Calculate van't Hoff factor for this solution. What will be the experimental molecular weight of NaCl?

(K_f for water = $1.86 \text{ K kg mol}^{-1}$, at. wt. Na = 23, Cl = 35.5)



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25. An aqueous solution containing 12.48g of barium chloride in 1.0 kg of water boils at 373.0832 K. Calculate the degree of dissociation of barium chloride. [Given K_b for $H_2O = 0.52K m^{-1}$, Molar mass of $BaCl_2 = 208.34g mol^{-1}$]



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26. Examine the defective crystal given below and answer the question that follows :

A^+	B^-	A^+	B^-	A^+
B^-		B^-	A^+	B^-
A^+	B^-	A^+		A^+
B^-	A^+	B^-	A^+	B^-

State if the above defect is stoichiometric or non-stoichiometric. How does this defect affect the density of the crystal ? Also, write the term used for this type of defect.



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27. Give reason for each of the following:

For ferric hydroxide sol the coagulating power of phosphate ion is more than chloride ion.



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28. How do you account for the following:

Medicines are more effective in their colloidal form.

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29. Give reason for each of the following:

Gelatin is added to icecreams.

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30. For the complex ion $[Fe(CN)_6]^{3-}$, state :

(i) the type of hybridisation.

(ii) the magnetic behaviour.

(iii) the oxidation number of the central metal atom.

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31. Write the IUPAC name of $[Cr(en)_2Cl_2]^+$ ion and draw the structures of its geometrical isomers.

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32. Why are Mn^{2+} compounds more stable than Fe^{2+} towards oxidation to their +3 state?

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33. Explain why:

(i) Transition elements form coloured compounds. (ii)

Cu^+ is diamagnetic but Cu^{2+} is paramagnetic ($Z=29$)



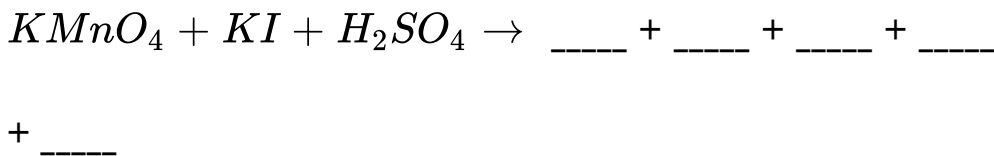
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34. Why do Zr and Hf exhibit similar properties?



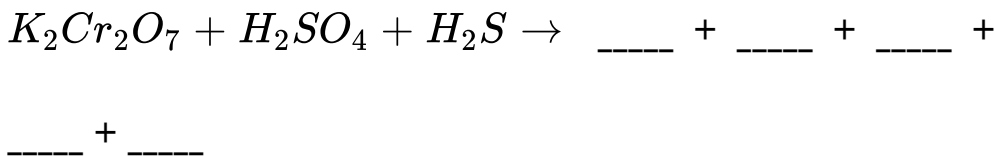
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35. Complete and balance the following chemical equations :



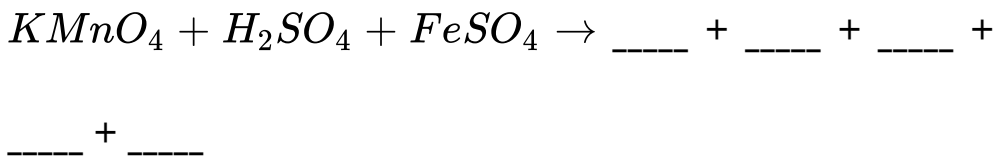
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36. Complete and balance the following chemical equations :



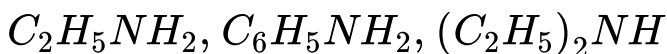
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37. Complete and balance the following chemical equations :



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38. Arrange the following in the increasing order of their basic strength :



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39. Give a balanced chemical equation to convert methyl cyanide to ethyl alcohol.



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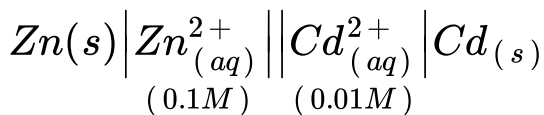
40. What happens when benzene diazonium chloride reacts with phenol in weak alkaline medium ? (Give balanced equation)

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41. Name the sulphide ore of Copper. Describe how pure copper is extracted from this ore.

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42. Calculate the emf and ΔG^0 for the cell reaction at $25^\circ C$:



Given $E_{\text{Zn}^{2+} / \text{Zn}}^0 = -0.763$

and $E_{\text{Cd}^{2+} / \text{Cd}}^0 = -0.403V$



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43. Define the following terms :

Equivalent conductivity



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44. Define the following terms :

Corrosion of metals

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45. The specific conductivity of a solution containing 5g of anhydrous $BaCl_2$ (mol.wt. = 208) in 1000 cm^3 of a solution is found to be $0.0058\text{ ohm}^{-1}\text{ cm}^{-1}$. Calculate the molar and equivalent conductivity of the solution.

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46. What is an electrochemical series ? How is it useful in predicting whether a metal can liberate hydrogen from acid or not?

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47. Nitrogen does not form pentahalides. Give reason.

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48. Explain why:

Helium is used for filling weather balloons.

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49. Why is ICl more reactive than I_2 ?

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50. Draw the structures of the following :

(i) XeF_4

(ii) $HClO_4$

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51. Draw the structures of the following:

H_3PO_3

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52. Explain why :

Mercury loses its meniscus in contact with ozone.

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53. Explain why :

Halogens are coloured and the colour deepens on moving down in the group from fluorine to iodine.

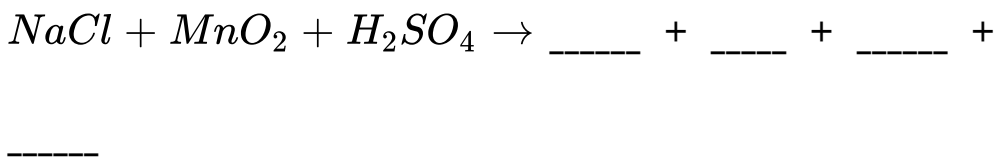
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54. Explain why :

Hydride of sulphur is a gas while hydride of oxygen is a liquid.

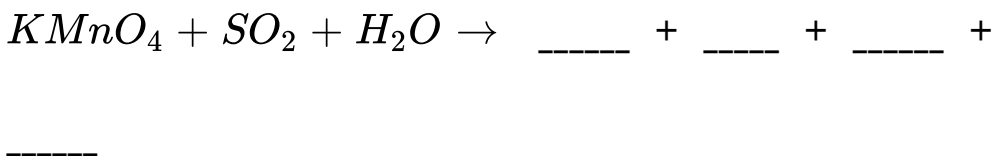
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55. Complete and balance the following reactions :



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56. Complete and balance the following reactions :



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57. Give balanced equations for the following reactions :

Benzaldehyde reacts with hydrazine.



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58. Give balanced equations for the following reactions :

Acetic acid reacts with phosphorus pentachloride.





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59. Give balanced equations for the following reactions :

Acetone reacts with sodium bisulphite.



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60. Give one chemical test to distinguish between the following pairs of compounds :

Ethanol and acetic acid



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61. Give one chemical test to distinguish between the following pairs of compounds :

Acetaldehyde and benzaldehyde

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62. Give balanced equations for the following name reactions :

Clemmensen's reduction.

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63. Give balanced equations for the following name reactions :

Rosenmund reaction

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64. Write chemical equations to illustrate the following name bearing reactions: (i) Cannizzaro 's reaction
(ii) Hell - Volhard -Zelinsky reaction

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65. Explain why:

Acetaldehyde undergoes aldol condensation, but formaldehyde does not.

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66. Explain why:

Acetic acid is a weaker acid as compared to formic acid.

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Question Answer The Following Question

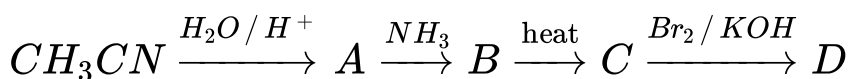
1. Why does the density of transition elements increase from Titanium to Copper? (At. No. Ti = 22, Cu = 29)

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2. Why is zinc not regarded as a transition element ?
(At. No. Zn = 30)

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3. Identify the compounds A, B, C and D.



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4. Determine the osmotic pressure of a solution prepared by dissolving 25 mg of K_2SO_4 in 2 litre of water at $25^\circ C$, assuming that it is completely dissociated.



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5. What type of isomerism is shown by the following coordination compounds ?



Write their IUPAC names.



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