CHEMISTRY

BOOKS - MODERN PUBLICATION

COORDINATION COMPOUNDS

EXAMPLE

1. Write the ligands of coordination entities and counter ions in the following coordination compound : $K_2\left[PtCl_4\right]$

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2. Designate the coordination entities and counter ions in the following coordination compound : $K_2\left[Ni(CN)_4\right]$

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3. Designate the coordination entities and counter ions in the following coordination compound : $\left[CrCl\left(NH_3\right)_5\right]Cl_2$

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4. Designate the coordination entities and counter ions in the following coordination compound : $K_4\left[Fe(CN)_6\right]$

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5. Designate the coordination entities and counter ions in the following coordination compound : $\left[Ni(CO)_4\right]$

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6. Write the formulas for the following coordination compounds: Potassium tetrahydroxidozincate(II)

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7. Write the formulas for the following coordination compounds: Tetraammineaquachloridocobalt(III) chloride

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8. Write the formulas for the following coordination compounds: Potassium trioxalatoaluminate(III)

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9. Write the formulas for the following coordination compounds: Dichloridobis(ethane-1,2-diamine)cobalt(III)

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10. Write the formulas for the following coordination compounds: Tetracarbonylnickel(O)

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11. Give the formulae of the following complex : tetraamminedichloridocobalt (III) ion.

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12. Give the formulae of the following complex : potassium tetracyanocuperate (II).

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13. Examples of foods that contain vitamin A are-

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14. Give the formulae of the following complex : potassiumpentacyanonitrosylferrate (II) .

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15. Give the formulae of the following complex : amminechloridobis (ethane-1,2-diamine) cobalt (III) ion.

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16. Give the formulae of the following complex : tetraamminedichloridocobalt (III) ion.

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17. Write IUPAC name of following $\left[PtCl\left(NH_2CH_3\right)\left(NH_3\right)_2\right]Cl.$

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18. Write the IUPAC name of the following: $\left[CoCl_2(en)_2\right]Cl$

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19. Fill in the blanks- _____ is the mineral that helps to regulate the muscle functioning and blood clotting.

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20. Write IUPAC name of the following

$K_3\left[Cr\left(C_2O_4\right)_3\right]$

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21. Complete the following statement- Functions of calcium are-

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22. Write the IUPAC name of the following: $\left[Hg\left[Co(SCN)_4\right]\right.$

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23. Give the names of the following complex ion : $\left[NiCl_4\right]^{2-}$

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24. Using IUPAC norms write the systematic names of the following:

$\left[Co(en)_3\right]^{3+}$

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25. Give the names of the following complex ion : $\left[Fe(CN)_6\right]^{4-}$

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26. Using IUPAC norms write the systematic names of the following:

$\left[Mn\left(H_2O\right)_6\right]^{2+}$

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27. Give the names of the following complex ion : $\left[CoCl(ONO)(en)_2\right]^{+}$

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28. Fill in the blanks- _____ is the pigment which is responsible for the process of photosynthesis.

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29. Write the IUPAC name of the following : $Na_3\left[Cr(OH)_2F_4\right]$

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30. Complete the following statement- Exchange of gases is done in plants through-

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31. Write the IUPAC name of the following :

$K_3\left[Fe(CN)_5NO\right]$

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32. Write the IUPAC name of the following: $\left[CoCl_2(en)_2\right]Cl$

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33. Write IUPAC name of the following

$Na\left[Au(CN)_2\right]$

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34. Write the IUPAC name of the following :

$\left[Co\left(NH_3\right)_4\left(H_2O\right)(Cl)\right]Cl_2$

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35. Write IUPAC name of following $\left[PtCl\left(NH_2CH_3\right)\left(NH_3\right)_2\right]Cl$.

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36. Write the IUPAC name of the following: $\left[Hg\left[Co(SCN)_4\right]\right.$

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37. Write the IUPAC name of the following : $\left[Co(en)_3\right]Cl_3$

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38. Express 1500 in roman numbers.

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39. Express 1183 in roman numbers.

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40. Write IUPAC name of the following

$K_3\left[Fe\left(C_2O_4\right)_3\right]$

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41. Write the IUPAC name of the following: $\left[CoCl_2(en)_2\right]Cl$

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42. Write IUPAC name of the following

$K_3\left[Cr\left(C_2O_4\right)_3\right]$

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43. Calculate the oxidation state of the central metal atom in the following : $K_4\left[Ni(CN)_4\right]$

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44. Write the IUPAC names of the following coordination compounds:

$\left[Pt\left(NH_3\right)_2CI\left(NO_2\right)\right]$

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45. Specify the oxidation numbers of the metals in the following coordination entities: $\left[CoBr_2(en)_2\right]^+$

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46. Write the IUPAC name of the $\left[Co\left(NH_3\right)_5ONO\right]Cl_2$

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47. Write the IUPAC name of the following : $\left[Co\left(NH_3\right)_5\left(NO_2\right)\right]\left(NO_3\right)_2$

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48. Write the IUPAC name of the following : $\left[Cr\left(NH_3\right)_2Cl_2(en)\right]Cl$

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49. Draw the geometrical isomers of the following complex : $\left[CoCl_2\left(NH_3\right)_4\right]^+$.

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50. Draw the geometrical isomers of the following complex : $\left[Fe\left(NH_3\right)_2(CN)_4\right]^-$

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51. Express 1388 in roman numbers.

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52. Draw the structure of : cis-dichlorotetracyanochromate (III).

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53. Draw the structure of : mer-triamminetrichlorocobalt (III) .

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54. Draw the structure of : fac-triaquatrinitro-N -cobalt (III).

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55. Express 1012 in roman numbers.

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56. Express 1012 in roman numbers.

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57. Express 1503 in roman numbers.

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58. Express 1505 in roman numbers.

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59. Express 1506 in roman numbers.

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60. Express 1507 in roman numbers.

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61. Express 1508 in roman numbers.

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62. Which type of complexes do not show geometrical isomerism ?

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63. Write IUPAC name of the following

$$\left[Co\left(NH_3\right)_3Cl\right]Cl_2$$

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64. Write IUPAC name of the following : $K_3\left[Fe(CN)_6\right]$

Watch Video Solution

65. Write the IUPAC name of $\left[CoCl\left(NH_3\right)_5\right]Cl_2$.

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66. Write all the geometrical isomers of $\left[Pt\left(NH_3\right)(Br)(Cl)(py)\right]$ and how many of these will exhibit optical isomers?

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67. Bell metal has the following composition-

A. Cu and Sn

B. Cu and Zn

C. Cu and Ni

D. None of the above

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68. Write IUPAC name of the complex: $\left[CoCl_2(en)_2\right]^+$.

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69. Give the formulae of the following complex : tetraamminedichloridocobalt (III) ion.

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70. Give the formulae of the following complex : potassium tetracyanocuperate (II).

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71. Write the IUPAC name of the compound $\left[Cr(NCS)\left(NH_3\right)_5\right]\left[ZnCl_4\right]$.

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72. What is the coordination entity formed when excess of aqueous KCN is added to an aqueous solution of copper sulphate? Why is it that no precipitate of copper sulphide is obtained when $H_2S(g)$ is passed through this solution?

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73. Specify which out of the following complex structures exhibit geometrical isomerism.

A. linear

B. square planar

C. tetrahedral

D. octahedral

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74. Write the correct formula for the following coordination compound : $CrCl_3.6H_2O$ (Violet with 3 chloride ions/unit formula)

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75. Write the correct formula for the following coordination compound : $CrCl_3.6H_2O$ (Dark green colour with 1 chloride ions/unit formula)

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76. Write the correct formula for the following coordination compound : $CrCl_3.6H_2O$ (Dark green colour with 1 chloride ions/unit formula)

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77. Write the formula for the complex dichloridobis (ethane-1,2-diamine) cobalt (III) chloride.

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78. Draw the structural formula of two isomers of the complex ion $\left[Co\left(NH_3\right)_5NO_2\right]^{2+}$. Name the type of isomerism and give their IUPAC names.

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79. Why does NH_3 readily form complexes but NH_4^+ does not ? Explain.

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80. Write the name of ionisation isomer of the compound $\left[Co\left(NH_3\right)_5Br\right]SO_4$.

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81. Write the following : Linkage isomer of $\left[Co\left(NH_3\right)_5ONO\right]Cl_2$

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82. Complete the following statement- For the process of photosynthesis plants require-

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83. Complete the following statement- Oxygen is expelled out of the plants through-

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84. What type of isomerism is exhibited by the complex $\left[Co(en)_3\right]^{3+}$?

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85. How many ions per mole of the following complexes are present in their solution ?

$\left[CoCl\left(NH_3\right)_5\right]Cl_2$.

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86. Complete the following statement- Plants take in carbon dioxide through small openings called-

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87. Complete the following statement- The process of transpiration is done in the plants through-

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88. Complete the following statement- Photosynthesis is-

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89. Complete the following statement- Stomata is-

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90. The spin only magnetic moment of $\left[MnBr_4\right]^{2-}$ is 5.9 BM. Predict the geometry of the complex ion ?

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91. Write the name, stereochemistry and magnetic behaviour of the following . (At. nos. Mn = 25, Co = 27, Ni = 28)

$K_4\left[Mn(CN)_6\right]$

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92. Complete the following statement- Plants need the process of photosynthesis because-

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93. Write the state of hybridization, the shape and the magnetic behaviour of the following complex entities : $K_2\left[Ni(CN)_4\right]$

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94. For the complex $\left[Fe(en)_2Cl_2\right]Cl$, identify the following : Magnetic behaviour of the complex.

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95. For the complex $\left[Fe(en)_2Cl_2\right]Cl$, identify the following : Hybrid orbitals and shape of the complex.

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96. For the complex $\left[Fe(en)_2Cl_2\right]Cl$, identify the following : Magnetic behaviour of the complex.

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97. Complete the following statement- During photosynthesis plants make their food in the form of-

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98. What is the coordinate number of the central metal ions in the following coordination compound $\left[Fe(en)_2Cl_2\right]Cl$

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99. For the complex $\left[Fe(en)_2Cl_2\right]Cl$, identify the following : Name of the complex.

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100. Give the formula of the following coordination entities - Ni^{2+} ion is bound to two water molecules and two oxalate ions. Write the name and magnetic behaviour of the above coordination entities. (At. nos, Co = 27, Ni = 28)

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101. Give the formula of the following coordination entities - Ni^{2+} ion is bound to two water molecules and two oxalate ions. Write the

name and magnetic behaviour of the above coordination entities. (At. nos, Co = 27, Ni = 28)

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102. With the help of crystal field theory, predict the number of unpaired electrons in $\left[Fe(CN)_6\right]^{4-}$ and $\left[Fe\left(H_2O\right)_6\right]^{2+}$.

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103. What is the coordinate number of the central metal ions in the following coordination compound ?

$\left[Ni\left(NH_3\right)_6\right]^{+2}$

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104. What is the coordinate number of the central metal ions in the following coordination compound ?

$\left[Co\left(NH_3\right)_5Cl\right]^{+2}$

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105. What is the coordinate number of the central metal ions in the following coordination compound ?

$\left[Fe(CN)_6\right]^{-3}$

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106. When a coordination compound $NiCl_2.6H_2O$ is mixed with $AgNO_3$, 2 moles of AgCl are precipitated per mole of the compound. Write Structural formula of the complex.

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107. When a coordination compound $NiCl_2.6H_2O$ is mixed wih $AgNO_3$, 2 moles of AgCl are precipitated per mole of the compound. Write IUPAC name of the complex.

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108. The complex $CoBr_3.4NH_3.2H_2O$ has molar conductivity corresponding to 1:3 electrolyte, Write the molecular formula and its IUPAC name.

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109. What is the coordinate number of the central metal ions in the following coordination compound ?

$\left[Ni\left(NH_3\right)_6\right]^{+2}$

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110. Explain how $\left[PtCl_2\left(NH_3\right)_2\right]$ and [Pt (NH_3)_6]Cl_4` differ in their electrolytic conductances?

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111. What is the coordinate number of the central metal ions in the following coordination compound ?

$\left[Co\left(NH_3\right)_4Cl_2\right]^+$

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112. Write the ligands and central metal atom of the following compound : $\left[Pt(CN)_4\right]^{2-}$

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113. Write the ligands and central metal atom of the following compound : $K_4\left[Ni(CN)_4\right]$

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114. predict the number of unpaired electrons in $\left[CoF_6\right]^{3-}$ and $\left[Co\left(NH_3\right)_6\right]^{3+}$

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115. Using valence bond theory explain the geometry and magnetic behaviour of pentacarbonyl iron (0).

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116. Explain the following statement- Plants perform photosynthesis.

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117. Complete the following statement- Plants lose excess water through leaves.

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118. Do we call metal carbonyls as organometallics ?

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119. What is the oxidation state of metals in the following carbonyls ?

(i) $Mn_2(CO)_{10}$ (ii) $Cr(CO)_6$

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120. Give an example of a metal carbonyl having metal-metal bond.

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121. Complete the following statement- Functions of stomata are-

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122. Do we call metal carbonyls as organometallics ?

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123. Write the formulas for the following coordination compounds:

Tetraamminediaquacobalt(III) chloride

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124. Write the formulas for the following coordination compounds: Potassium tetracyanidonickelate(II)

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125. Write the formulas for the following coordination compounds: Tris(ethane-1,2-diamine) chromium(III) chloride

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126. Explain the following statement- Plants exchange gases during photosynthesis.

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127. Write the formulas for the following coordination compounds:

Dichloridobis(ethane-1,2-diamine)platinum(IV) nitrate

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128. Write the formulas for the following coordination compounds:

Iron(III) hexacyanidoferrate(II)

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129. Write the IUPAC names of the following coordination compounds: $\left[CO\left(NH_3\right)_6\right]CI_3$

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130. Write the IUPAC names of the following coordination compounds: $\left[CO\left(NH_3\right)_6\right]CI_3$

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131. Write the IUPAC name of the following coordination compound :

$K_3\left[Fe(CN)_6\right]$

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132. Write the IUPAC name of the following coordination compound :

$K_3\left[Fe(CN)_6\right]$

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133. Answer the following question- What happen during the process of photosynthesis?

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134. Complete the following statement- Plants absorb carbon dioxide during the process of-

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135. Complete the following statement- Chlorophyll is-

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136. Answer the following question- How plants synthesize their food?

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137. Can the process of photosynthesis occur at night?

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138. Answer the following question- Which gas is liberated during photosynthesis?

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139. Express 1516 in roman numbers.

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140. Complete the following statement- Bordo mix is-

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141. Express 1517 in roman numbers.

Watch Video Solution

142. Express 1518 in roman numbers.

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143. Describe the statement- Ammonal is-

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144. Express 1520 in roman numbers.

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145. Express 1521 in roman numbers.

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146. Express 1522 in roman numbers.

Watch Video Solution

147. Express 1523 in roman numbers.

Watch Video Solution

148. Express 1525 in roman numbers.

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149. Express 1526 in roman numbers.

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150. Express 1527 in roman numbers.

Watch Video Solution

151. Express 1528 in roman numbers.

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152. Express 1530 in roman numbers.

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153. Express 1531 in roman numbers.

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154. Express 1532 in roman numbers.

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155. Express 1533 in roman numbers.

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156. Express 1535 in roman numbers.

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157. Express 1536 in roman numbers.

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158. Using IUPAC norms write the formulas for the following: Potassium tetrachloridopalladate(II)

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159. Using IUPAC norms write the systematic names of the following: Potassium tri (oxalato) chromate (III)

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160. Express 1537 in roman numbers.

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161. Using IUPAC norms write the formulas for the following: Hexaammineplatinum (IV)

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162. Express 1538 in roman numbers.

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163. Using IUPAC norms write the formulas for the following: Tetrabromidocuprate (II)

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164. Using IUPAC norms write the formulas for the following: Pentaaminenitrito-O-coblt (III)

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165. Using IUPAC norms write the formulas for the following: Pentaaminenitrito-O-coblt (III)

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166. Write the ligands and central metal atom of the following compound : $\left[Co\left(NH_3\right)_6\right]Cl_3$

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167. Write the ligands and central metal atom of the following compound : $\left[Mn\left(H_2O\right)_6\right]^{2+}$

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168. Write the ligands and central metal atom of the following compound : $\left[Co(en)_3\right]^{3+}$

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169. Describe the following statement- Baking powder is-

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170. Using IUPAC norms write the systematic name of the following : $\left[NiCl_4\right]^{2-}$

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171. Write the ligands and central metal atom of the following compound : $\left[Ni(CO)_4\right]$

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172. List various types of isomerism possible for coordination compounds, giving an example of each.

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173. How many geometrical isomers are possible in the following coordination entities: `[Cr(C_2O_4)_3]^3-

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174. Write the ligands and central metal atom of the following compound : $\left[Co\left(NH_3\right)_3Cl_3\right]$

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175. Write the ligands and central metal atom of the following compound : $\left[Cr\left(C_2O_4\right)_3\right]^{3-}$

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176. Write the ligands and central metal atom of the following compound : $\left[PtCl_2(en)_2\right]^{2+}$

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177. Write the ligands and central metal atom of the following compound : $Cr\left(NH_3\right)_2Cl_2(en)]^+$

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178. Write the coordination number of central atom in the following coordination compound : $\left[CoCl_2(en)_2\right]^+$

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179. Write the coordination number of central atom in the following coordination compound : $\left[Co\left(NH_3\right)Cl(en)_2\right]^{2+}$

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180. Write the coordination number of central atom in the following coordination compound : $\left[Co\left(NH_3\right)_2Cl_2(en)\right]^+$

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181. Write all the geometrical isomers of $\left[Pt\left(NH_3\right)(Br)(Cl)(py)\right]$ and how many of these will exhibit optical isomers?

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182. Aqueous copper sulphate solution (blue in colour) gives: a green precipitate with aqueous potassium fluoride

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183. Write the coordination number of central atom in the following coordination compound : $\left[NiCl_2\left(H_2O\right)_4\right]$

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184. Write the coordination number of central atom in the following coordination compound : $K\left[Ag(CN)_2\right)$

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185. Discuss the nature of bonding in metal carbonyls.

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186. Give the oxidation state, d orbital occupation and coordination number of the central metal ion in the following complexes:

$K_3\left[Co\left(C_2O_4\right)_3\right]$

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187. Give the oxidation state, d orbital occupation and coordination number of the central metal ion in the following complexes: $\left(NH_4\right)_2\left[CoF_4\right]$

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188. Give the oxidation state, d orbital occupation and coordination number of the central metal ion in the following complexes: cis - $\left[CrCI_2\right)en)_2\left]CI\right.$

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189. Give the oxidation state, d orbital occupation and coordination number of the central metal ion in the following complexes: $\left[Mn\left(H_2O\right)_6\right]SO_4$

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190. Write down the IUPAC name for each of the following complexes and indicate the oxidation state, electronic configuration and coordination number. Also give stereochemistry and magnetic moment of the complex: $K\left[Cr\left(H_2O\right)_2\left(C_2O_4\right)_2\right].3H_2O$

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191. Write down the IUPAC name for each of the following complexes and indicate the oxidation state, electronic configuration and

coordination number. Also give magnetic moment of the complex: $\left[CrCI_3(py)_3\right]$

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192. Write down the IUPAC name for each of the following complexes and indicate the oxidation state, electronic configuration and coordination number. Also give stereochemistry and magnetic moment of the complex: $K_4\left[Mn(CN)_6\right]$

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193. Write down the IUPAC name for each of the following complexes and indicate the oxidation state, electronic configuration and coordination number. Also give stereochemistry and magnetic moment of the complex: $\left[Co\left(NH_3\right)_5CI\right]CI_2$

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194. Write down the IUPAC name for each of the following complexes and indicate the oxidation state, electronic configuration and coordination number. Also give magnetic moment of the complex: $Cs\left[FeCI_4\right]$

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195. What is meant by stability of a coordination compound in solution? State the factors which govern

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196. What is meant by the chelate effect? Give an example.

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197. Discuss briefly giving an example in each case the role of coordination compunds in: biological systems

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198. Discuss briefly giving an example in each case the role of coordination compunds in: analytical chemistry

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199. Discuss briefly giving an example in each case the role of coordination compunds in: medicinal chemistry and

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200. Discuss briefly giving an example in each case the role of coordination compunds in: extraction/metallurgy of metals

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201. How many ions are produced from the complex

$$\left[Co\left(NH_3\right)_6\right]Cl_2$$

in solution ?

A. 6

B. 4

C. 3

D. 2

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202. Amongst the following ions which one has the highest magnetic moment value: $\left[Fe\left(H_2O\right)_6\right]^{2+}$

A. $\left[Cr\left(H_2O\right)_6\right]^{3+}$

B. $\left[Fe\left(H_2O\right)_6\right]^{2+}$

C. $\left[Zn\left(H_2O\right)_6\right]^{2+}$

D.

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203. The oxidation number of cobalt in $K\left[Co(CO)_4\right]$ is

A. $+1$

B. $+3$

C. -1

D. -3

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204. Amongst the following, the most stable complex is

A. $\left[Fe\left(H_2O\right)_6\right]^{3+}$

B. $\left[Fe\left(NH_3\right)_6\right]^{3+}$

C. $\left[Fe\left(C_2O_4\right)_3\right]^{3-}$

D. $\left[FeCl_6\right]^{3-}$

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205. What will be the correct order for the wavelengths of absorption in the visible region for the following: $\left[Ni\left(NO_2\right)\right)6]^{4-}$, $\left[Ni\left(NH_3\right)_6\right]^{2+}$, $\left[Ni\left(H_2O\right)_6\right]^{2+}$?

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206. Arrange the following complexes in the increasing order of conductivity of their solution: $\left[Co\left(NH_3\right)_3Cl_3\right]$, $\left[Co\left(NH_3\right)_4Cl_2\right]Cl$, $\left[Co\left(NH_3\right)_6\right]Cl_3$, $\left[Cr\left(NH_3\right)_5Cl\right]Cl_2$

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207. A coordination compound $CrCl_3.4H_2O$ precipitates silver chloride with $AgNO_3$. The molar conductivity of the solution corresponds to a total number of two ions. Write structural formula of the compound and name it.

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208. A complex of the type $\left[M(AA)_2X_2\right]^{n+}$ is known to be optically active. What does this indicate about the structure of the complex? Give an example of such complex.

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209. Complete the following statement- Baking powder is made up of-

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210. Fill in the blanks- Baking powder is a mixture of _____ and _____.

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211. Explain the following statement- An explosive is made up of aluminium powder and Ammonium nitrate.

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212. Explain the following statement- A fungicide is made up of by the mixture of solution of copper sulphate and calcium oxide.

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213. Describe the following statement in brief- Bordeaux mixture is used to kill moulds and fungus of plants.

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214. Describe the following statement- An explosive is made up of Potassium nitrate, sulphur and charcoal.

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215. Complete the following statement- Gun powder is made up of-

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216. $CuSO_4.5H_2O$ is blue in colour while $CuSO_4$ is colourless. Why ?

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217. Name the following- Gun powder is a mixture of two fuels and an oxidizer.

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218. Why $Cu(OH)_2$ is soluble in NH_4OH but not in NaOH solution ?

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219. The complex $\left[Co\left(NH_3\right)_5Br\right]SO_4$ give white precipitates with $BaCl_2$ solution while $\left[CO\left(NH_3\right)_5SO_4\right]Br$ give yellow precipitate with $AgNO_3$ solution. Explain.

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220. Arrange the following complexes in the increasing order of conductivity of their solution: $\left[Co\left(NH_3\right)_3Cl_3\right]$, $\left[Co\left(NH_3\right)_4Cl_2\right]Cl$, $\left[Co\left(NH_3\right)_6\right]Cl_3$, $\left[Cr\left(NH_3\right)_5Cl\right]Cl_2$

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221. Arrange the following complexes in the increasing order of conductivity of their solution: $\left[Co\left(NH_3\right)_3Cl_3\right]$, $\left[Co\left(NH_3\right)_4Cl_2\right]Cl$, $\left[Co\left(NH_3\right)_6\right]Cl_3$, $\left[Cr\left(NH_3\right)_5Cl\right]Cl_2$

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222. Express 1550 in roman numbers.

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223. Choose the correct option- Brass is used in-

A. In making utensils and wires

B. In making pistols and guns

C. In making coins

D. None of the above.

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224. $\left[Ti\left(H_2O\right)_6\right]^{3+}$ absorbs light of a wavelength 500 nm. Name one ligand which would form Ti(IID) complex absorbing light of lower wavelength than 500 nm and one ligand which would form acomplex absorbing light of wavelength higher than 500 nm.

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225. An aqueous solution freezes at 272.07K, while pure water freezes at 273K. Determine the molality of the solution.

(given K_f for water=$1.86\frac{K}{m}$

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226. When a coordination compound $NiCl_2.6H_2O$ is mixed with $AgNO_3$, 2 moles of AgCl are precipitated per mole of the compound. Write Structural formula of the complex.

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227. Complete the following statement- Gobar gas is-

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228. Fill in the blanks- Gobar gas contains ___, ___, _____ gases in it.

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229. Complete the following statement- The gases produced when plants waste and animals waste get decomposed in the biogas plant are-

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230. Which coordination componnd used in the treatment of lead poisoning.

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231. Brass alloy is made up of-

A. Cu and Sn

B. Cu and Al

C. Cu and Zn

D. Cu and Ni

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232. A coordination compound has the formula $CoCl_3.4NH_3$. It precipitates silver ions as AgCl and its molar conductance corresponds to a total of two ions. Deduce its structural formula and name the complex.

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233. Choose the correct option- Which alloy is made up of 70% of copper and 30% of zinc?

A. Bronze

B. Artificial gold

C. Bell metal

D. Brass

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234. A coordination compound has the formula $CoCl_3.4NH_3$. It precipitates silver ions as AgCl and its molar conductance corresponds to a total of two ions. Replace ammonia molecules by two molecules of ethylenediamine and discuss isomerism in the resulting complex ion.

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235. Calculate the ratio $\left[Ag^+\right]/\left[Ag\left(NH_3\right)_2\right]^+$ in 0.1 M NH_3 Solution if stability constant, K_f for $\left[Ag\left(NH_3\right)_2\right]^+$ is 1.7×10^7.

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236. A Compound with the empirical formula $Co\left(NH_3\right)_5BrSO_4$ exists in two forms : red and violet. Solution of red gives a precipitate of

AgBr on addition of $AgNO_3$. The violet form Sives no precipitate on the addition at $AgNO_3$ but gives a white precipitate on addition of $BaCl_2$ solution. From these observations draw the structure of each compound and explain the observations.

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237. The complex $CoBr_3.4NH_3.2H_2O$ has molar conductivity corresponding to 1:3 electrolyte, Write the molecular formula and its IUPAC name.

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238. An element Z has valency of 3. Write down the formula of its oxide?

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239. Name a stain commonly used to colour chromosomes.

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240. $K_4\left[Fe(CN)_6\right]$ is a

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241. Write the ligands of coordination entities and counter ions in the following coordination compound : $K_2\left[PtCl_4\right]$

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242. Designate the coordination entities and counter ions in the following coordination compound : $K_2\left[Ni(CN)_4\right]$

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243. Designate the coordination entities and counter ions in the following coordination compound : $\left[CrCl\left(NH_3\right)_5\right]Cl_2$

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244. Designate the coordination entities and counter ions in the following coordination compound : $K_4\left[Fe(CN)_6\right]$

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245. Designate the coordination entities and counter ions in the following coordination compound : $\left[Ni(CO)_4\right]$

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246. Write the formula of the following coordination compound : potassium tetrachloridozincate(II)

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247. Write the formulas for the following coordination compounds: Tetraammineaquachloridocobalt(III) chloride

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248. Write the formulas for the following coordination compounds: Potassium trioxalatoaluminate(III)

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249. Write the formulas for the following coordination compounds: Dichloridobis(ethane-1,2-diamine)cobalt(III)

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250. Write the formulas for the following coordination compounds: Tetracarbonylnickel(O)

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251. Write the formula of the following coordination compound : ammineaquadibromidocopper(II)

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252. Give the formulae of the following complex : potassium tetracyanocuperate (II).

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253. Using IUPAC norms write the formulas for the following: Diamminedichloridoplatinum(II)

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254. Give the formulae of the following complex : potassiumpentacyanonitrosylferrate (II) .

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255. Give the formulae of the following complex : amminechloridobis (ethane-1,2-diamine) cobalt (III) ion.

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256. Give the formulae of the following complex : tetraamminedichloridocobalt (III) ion.

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257. Write IUPAC name of following $\left[PtCl\left(NH_2CH_3\right)\left(NH_3\right)_2\right]Cl.$

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258. Write the IUPAC name of the following: $\left[CoCl_2(en)_2\right]Cl$

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259. Write IUPAC name of the following : $\left[Pt\left(NH_3\right)_2Cl\left(NO_2\right)\right]$

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260. Write IUPAC name of the following

$K_3\left[Cr\left(C_2O_4\right)_3\right]$

Watch Video Solution

261. Write the IUPAC name of the following: $\left[Co\left(NH_3\right)_5\left(CO_3\right)\right]Cl$

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262. Write the IUPAC name of the following: $\left[Hg\left[Co(SCN)_4\right]\right.$

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263. Give the names of the following complex ion : $\left[NiCl_4\right]^{2-}$

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264. Write the ligands and central metal atom of the following compound : $\left[Co(en)_3\right]^{3+}$

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265. Give the names of the following complex ion : $\left[Fe(CN)_6\right]^{4-}$

Watch Video Solution

266. Using IUPAC norms write the systematic names of the following:

$\left[Mn\left(H_2O\right)_6\right]^{2+}$

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267. Give the names of the following complex ion : $\left[CoCl(ONO)(en)_2\right]^+$

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268. Give the formula of following compound : triaquatrinitrosylchromium(III)chloride

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269. Write the IUPAC name of the following : $Na_3\left[Cr(OH)_2F_4\right]$

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270. Write the IUPAC name of the following : $\left[Co(en)_2(ONO)Cl\right]^+$

Watch Video Solution

271. Write the IUPAC name of the following :

$K_3\left[Fe(CN)_5NO\right]$

Watch Video Solution

272. Write the IUPAC name of the following: $\left[CoCl_2(en)_2\right]Cl$

Watch Video Solution

273. Write IUPAC name of the following

$Na\left[Au(CN)_2\right]$

Watch Video Solution

274. Write the IUPAC name of the following :

$\left[Co\left(NH_3\right)_4\left(H_2O\right)(Cl)\right]Cl_2$

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275. Write IUPAC name of following $\left[PtCl\left(NH_2CH_3\right)\left(NH_3\right)_2\right]Cl.$

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276. Write the IUPAC name of the following: $\left[Hg\left[Co(SCN)_4\right]\right.$

Watch Video Solution

Watch Video Solution

277. Write the IUPAC name of the following : $\left[Co(en)_3\right]Cl_3$

Watch Video Solution

278. Write the IUPAC name of the following :

$Na_3\left(Co\left(NO_2\right)_6\right]$

Watch Video Solution

279. Write IUPAC name of the following : $\left[Ag\left(NH_3\right)_2\right]\left[Ag(CN)_2\right]$

Watch Video Solution

280. Write IUPAC name of the following

$K_3\left[Fe\left(C_2O_4\right)_3\right]$

Watch Video Solution

281. Write the IUPAC name of the following: $\left[CoCl_2(en)_2\right]Cl$

Watch Video Solution

282. Write IUPAC name of the following

$K_3\left[Cr\left(C_2O_4\right)_3\right]$

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283. Calculate the oxidation state of the central metal atom in the following : $K_4\left[Ni(CN)_4\right]$

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284. Give the formula of following compound : potassium tertaflouridocuperate (II)

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285. Write the IUPAC name of the following : $\left[CoBr_2(en)_2\right]^+$

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286. Write the IUPAC name of the following : $\left[Co\left(NH_3\right)_5ONO\right]Cl_2$

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287. Write the IUPAC name of the following : $\left[Co\left(NH_3\right)_5\left(NO_2\right)\right]\left(NO_3\right)_2$

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288. Write the IUPAC name of the following : $\left[Cr\left(NH_3\right)_2Cl_2(en)\right]Cl$

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289. Draw the geometrical isomers of the following complex : $\left[CoCl_2\left(NH_3\right)_4\right]^+$.

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290. Draw the geometrical isomers of the following complex : $\left[Fe\left(NH_3\right)_2(CN)_4\right]^-$

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291. Give any two uses of gypsum?

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292. Draw the structure of : cis-dichlorotetracyanochromate (III).

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293. Draw the structure of : mer-triamminetrichlorocobalt (III) .

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294. Draw the structure of : fac-triaquatrinitro-N -cobalt (III).

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295. Is the following compound chiral (optically active)? *cis* - $\left[CrCI_2(ox)_2\right]^3$ -

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296. Express 2227 in roman numbers.

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297. Draw the structures of optical isomers of: $\left[Cr\left(C_2O_4\right)_3\right]^3$ -

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298. Give the formula of following compound : potassium dibromidotricyanidonitrosylferrate (II)

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299. Give the formula of following compound : amminebis(ethylenediamine)nitrocobalt(III)ion

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300. What type of isomerism is exhibited by the complex $\left[Co(en)_3\right]^{3+}$?

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301. Give the formula of following compound : diamminediaquadichloridocobalt(III)ion

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302. Which type of complexes do not show geometrical isomerism ?

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303. Write the IUPAC name of the following : $\left[Co\left(NH_3\right)_5ONO\right]Cl_2$

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304. Write the IUPAC name of the following : $K_3\left[Cr(CN)_6\right]$

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305. Write the IUPAC name of $\left[CoCl\left(NH_3\right)_5\right]Cl_2$.

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306. Write all the geometrical isomers of $\left[Pt\left(NH_3\right)(Br)(Cl)(py)\right]$ and how many of these will exhibit optical isomers?

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307. What is the chemical composition of marble?

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308. Give the formula of following compound : tris(ethylenediamine)cobalt(III)ion

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309. Write the formulae of the following complex : Pentaamminechloridocobalt (III) ion .

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310. Give the formulae of the following complex : potassium tetracyanocuperate (II).

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311. Give the formula of following compound : hexacyanidoferrate(II)ion

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312. What is the coordination entity formed when excess of aqueous KCN is added to the aqueous solution of copper sulphate? Why is it that no precipitate of copper sulphide is obtained when H_2S (g) is passed through this solution .

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313. Give the formula of following compound : hexaaquamanganese(II)ion

A.

B.

C.

D.

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314. Write the correct formula for the following coordination compound : $CrCl_3.6H_2O$ (Violet with 3 chloride ions/unit formula)

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315. Write the correct formula for the following coordination compound : $CrCl_3.6H_2O$ (Dark green colour with 1 chloride ions/unit formula)

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316. Write the correct formula for the following coordination compound : $CrCl_3.6H_2O$ (Dark green colour with 1 chloride ions/unit formula)

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317. Marble is-

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318. Give the formula of following compound : chloridobis(ethylenediamine)nitrito-N-cobalt(III)ion

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319. Why does NH_3 readily form complexes but NH_4^+ does not ?

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320. Write the name of ionisation isomer of the compound $\left[Co\left(NH_3\right)_5Br\right]SO_4$.

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321. Write the following : Linkage isomer of $\left[Co\left(NH_3\right)_5ONO\right]Cl_2$

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322. Write the following : Coordination isomer of $\left[Cu\left(NH_3\right)_4\right]\left[PtCl_4\right]$

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323. The IUPAC name of the complex $\left[P\left(NH_3\right)_3Br\left(NO_2\right)Cl\right]Cl$ is

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324. What type of isomerism is exhibited by the complex $\left[Co(en)_3\right]^{3+}$?

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325. How many ions per mole of the following complexes are present in their solution ?

$\left[CoCl\left(NH_3\right)_5\right]Cl_2$.

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326. Give the formula of following compound : sodium tetraflouridodihydroxidochromate(III)

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327. How many ions per mole of the following complexes are present in their solution ?

$\left[CoCl\left(NH_3\right)_5\right]Cl_2$.

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328. How many ions per mole of the following complexes are present in their solution ?

$\left[CoCl\left(NH_3\right)_5\right]Cl_2$.

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329. Give the formula of following compound : sodium dicyanidoaurate (I)

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330. The spin only magnetic moment of $\left[MnBr_4\right]^{2-}$ is 5.9 BM. Predict the geometry of the complex ion ?

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331. Write the name, stereochemistry and magnetic behaviour of the following . (At. nos. Mn = 25, Co = 27, Ni = 28)

$K_4\left[Mn(CN)_6\right]$

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332. Write the name, stereochemistry and magnetic behaviour of the following . (At. nos. Mn = 25, Co = 27, Ni = 28)

$\left(Co\left(NH_3\right)_5Cl\right]Cl_2$.

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333. Write the shape and magnetic behaviour of the following complex : $\left[Ni(CN)_4\right]^{2-}$

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334. For the complex $\left[Fe(en)_2Cl_2\right]Cl$, identify the following : Oxidation number of iron.

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335. For the complex $\left[Fe(en)_2Cl_2\right]Cl$, identify the following : Hybrid orbitals and shape of the complex.

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336. For the complex $\left[Fe(en)_2Cl_2\right]Cl$, identify the following : Magnetic behaviour of the complex.

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337. For the complex $\left[Fe(en)_2Cl_2\right]Cl$, identify the following : Name of the complex.

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338. For the complex $\left[Fe(en)_2Cl_2\right]Cl$, identify the ligands & central atom.

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339. For the complex $\left[Fe(en)_2Cl_2\right]Cl$, identify the following : Name of the complex.

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340. Give the formula of the following coordination entities - Ni^{2+} ion is bound to two water molecules and two oxalate ions. Write the name and magnetic behaviour of the above coordination entities. (At. nos, Co = 27, Ni = 28)

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341. Give the formula of the following coordination entities - Ni^{2+} ion is bound to two water molecules and two oxalate ions. Write the name and magnetic behaviour of the above coordination entities. (At. nos, Co = 27, Ni = 28)

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342. With the help of crystal field theory, predict the number of unpaired electrons in $\left[Fe(CN)_6\right]^{4-}$ and $\left[Fe\left(H_2O\right)_6\right]^{2+}$.

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343. Define crystal field splitting energy. Write the electronic configuration of d^4 in terms of t_{2g} and eg in octahedral field when $i)\Delta_0 > P$ ii) $\Delta_0 < P$

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344. Explain the following observations : Although Co^{2+} ion appears to be stable, it is easily oxidised to Co^{3+} ion in the presence of a strong ligand.

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345. State a reason for the following situation : CO is a stronger complexing reagent than NH_3.

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346. When a coordination compound $NiCl_2.6H_2O$ is mixed with $AgNO_3$, 2 moles of AgCl are precipitated per mole of the compound. Write Structural formula of the complex.

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347. When a coordination compound $NiCl_2.6H_2O$ is mixed wih $AgNO_3$, 2 moles of AgCl are precipitated per mole of the compound. Write IUPAC name of the complex.

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348. The complex $CoBr_3.4NH_3.2H_2O$ has molar conductivity corresponding to 1:3 electrolyte, Write the molecular formula and its IUPAC name.

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349. A coordination compound $CrCl_3.4H_2O$ precipitates silver chloride with $AgNO_3$. The molar conductivity of the solution corresponds to a total number of two ions. Write structural formula of the compound and name it.

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350. Explain how $\left[PtCl_2\left(NH_3\right)_2\right]$ and [Pt (NH_3)_6]Cl_4` differ in their electrolytic conductances?

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351. A metal complex having the molecular formula $Cr\left(NH_3\right)_4Cl_2$,Br have been isolated in two forms (A) and (B). The form (A) reacts with $AgNO_3$ giving white precipitate readily soluble in dilute NH_4OH while (B) gives a yellow precipitate soluble in concentrated NH_4OH. Answer the following questions : The formula of complex A is

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352. Predict the number of unpaired electrons in the square planar $\left[Pt(CN)_4\right]^{2-}$ ion.

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353. With the help of the crystal field theory predict the number of unpaired electrons in $\left[Fe(CN)_6\right]^{3-}$ and $\left[FeF_6\right]^{3-}$.

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354. Give the formula of following compound : pentaamminechloridocobalt(III)chloride

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355. Using valence bond theory explain the geometry and magnetic behaviour of pentacarbonyl iron (0).

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356. Account for the different magnetic behaviour of hexacyanoferrate (III) and hexafluoroferrate(III).

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357. Give the formula of following compound : diaquachlorido(methylamine)platinum(II)chloride

A.

B.

C.

D.

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358. Do we call metal carbonyls as organometallics ?

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359. What is the oxidation state of metals in the following carbonyls ?

(i) $Mn_2(CO)_{10}$ (ii) $Cr(CO)_6$

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360. Give an example of a metal carbonyl having metal-metal bond.

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361. Give an example of an organometallic compound having sandwich structure.

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362. Do we call metal carbonyls as organometallics ?

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363. Write the formulas for the following coordination compounds:

Tetraamminediaquacobalt(III) chloride

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364. Write the formulas for the following coordination compounds:

Potassium tetracyanidonickelate(II)

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365. Write the formulas for the following coordination compounds:

Tris(ethane-1,2-diamine) chromium(III) chloride

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366. Write the formulas for the following coordination compounds:

Amminebromidochloridonitrito-N-platinate(II)

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367. Write the formulas for the following coordination compounds:

Dichloridobis(ethane-1,2-diamine)platinum(IV) nitrate

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368. Write the formulas for the following coordination compounds:

Iron(III) hexacyanidoferrate(II)

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369. Write the IUPAC names of the following coordination compounds: $\left[CO\left(NH_3\right)_6\right]CI_3$

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370. Write the IUPAC names of the following coordination compounds: $\left[Co\left(NH_3\right)_5\left(CO_3\right)\right]CI$

Watch Video Solution

371. Write the IUPAC name of the following coordination compound : $K_3\left[Fe(CN)_6\right]$

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372. Write the IUPAC name of the following coordination compound :

$K_3\left[Fe\left(C_2O_4\right)_3\right]$

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373. Write the IUPAC name of the following coordination compound :

$K_2\left[PdCl_4\right]$

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374. Write the IUPAC names of the following coordination compounds: $\left[Pt\left(NH_3\right)_2Cl\left(NH_2CH_3\right)\right]Cl$

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375. Indicate the types of isomerism exhibited by the following complexes and draw the structures for these isomers: $K\left[Cr\left(H_2O\right)_2\left(C_2O_4\right)_2\right]$

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376. Indicate the types of isomerism exhibited by the following complexes and draw the structures for these isomers: $\left[Co(en)_3\right]CI_3$

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377. Indicate the types of isomerism exhibited by the following complexes and draw the structures for these isomers: $\left[CO\left(NH_3\right)_5\left(NO_2\right)\right]\left(NO_3\right)_2$

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378. Indicate the types of isomerism exhibited by the following complexes and draw the structures for these isomers: $\left[Pt\left(NH_3\right)\left(H_2O\right)CI_2\right]$

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379. Give evidence that [CO(NH3)5Cl]S04 and [CO(NH3)5(S04)]Cl are ionisation isomers.

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380. Explain on the basis of valence bond theory that $\left[Ni(CN)_4\right]^{2-}$ ion with square planar structure is diamagnetic and the $\left[NiCl_4\right]^{2-}$ ion with tetrahedral geometry is paramagnetic.

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381. NiCl4 2- is paramagnetic while NiCO4 is diamagnetic though both are tetrahedral why

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382. $\left[Fe\left(H_2O\right)_6\right]^{3+}$ is strongly paramagnetic whereas $\left[Fe(CN)_6\right]^{3-}$ is weakly paramagnetic. Explain.

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383. Explain $\left[Co\left(NH_3\right)_6\right]^{3+}$ is an inner orbital complex whereas $\left[Ni\left(NH_3\right)\right)6]^{2+}$ is an outer orbital complex.

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384. Predict the number of unpaired electrons in the square planar $\left[Pt(CN)_4\right]^{2-}$ ion.

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385. The hexaquo manganese(II) ion contains five unpaired electrons, while the hexacyanoion contains only one unpaired electron. Explain using Crystal Field Theory.

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386. Calculate the overall complex dissociation equilibrium constant for the $Cu\left(NH_3\right)_4^{2+}$ ion, given that $\beta 4$ for this complex is 2.1×10^{13}.

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387. Explain the bonding in coordination compounds in terms of Werner's postulates.

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388. $FeSO_4$ solution mixed with $\left(NH_4\right)_2SO_4$ solution in 1:1 molar ratio gives the test of Fe^{2+} ion but $CuSO_4$ solution mixed with aqueous ammonia in 1:4 molar ratio does not give the test of Cu^{2+} ion. Explain why ?

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389. Explain with two examples each of the following: coordination entity, ligand, coordination number, coordination polyhedron, homoleptic and heteroleptic.

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390. What is meant by unidentate, didentate and ambidentate ligands ? Give two examples for each.

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391. Specify the oxidation numbers of the metals in the following coordination entities: $\left[Co\left(H_2O\right)(CN)(en)_2\right]^{2+}$

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392. Specify the oxidation numbers of the metals in the following coordination entities: $\left[PtCl_4\right]^{2-}$

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393. Specify the oxidation numbers of the metals in the following coordination entities: $\left[Cr\left(NH_3\right)_3Cl_3\right]$

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394. Specify the oxidation numbers of the metals in the following coordination entities: $\left[CoBr_2(en)_2\right]^+$

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395. Specify the oxidation numbers of the metals in the following coordination entities: $K_3\left[Fe(CN)_6\right]$

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396. Write the formulas for the following coordination compounds: Potassium tetrahydroxidozincate(II)

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397. Using IUPAC norms write the formulas for the following: Hexaamminecobalt (III) sulphate

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398. Using IUPAC norms write the formulas for the following: Potassium tetrachloridopalladate(II)

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399. Using IUPAC norms write the systematic names of the following: Potassium tri (oxalato) chromate (III)

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400. Using IUPAC norms write the formulas for the following: Diamminedichloridoplatinum(II)

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401. Using IUPAC norms write the formulas for the following: Hexaammineplatinum (IV)

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402. Write the formula for the following complex : Potassium tetracyanonickelate (II)

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403. Using IUPAC norms write the formulas for the following: Tetrabromidocuprate (II)

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404. Using IUPAC norms write the formulas for the following: Pentaaminenitrito-O-coblt (III)

Watch Video Solution

405. Using IUPAC norms write the formulas for the following: Pentaaminenitrito-O-coblt (III)

Watch Video Solution

406. Using IUPAC norms write the systematic name of the following :

$$\left[Co\left(NH_3\right)_6\right]Cl_3$$

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407. Using IUPAC norms write the systematic names of the following:

$$\left[Co\left(NH_3\right)_4Cl\left(NO_2\right)\right]Cl$$

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408. Using IUPAC norms write the systematic names of the following:

$$\left[Ni\left(NH_3\right)_6\right]Cl_2$$

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409. Using IUPAC norms write the systematic name of the following :

$$\left[Pt\left(NH_3\right)_2Cl\left(NH_2CH_3\right)\right]Cl$$

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410. Using IUPAC norms write the systematic names of the following:

$$\left[Mn\left(H_2O\right)_6\right]^{2+}$$

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411. Using IUPAC norms write the systematic names of the following:

$\left[Co(en)_3\right]^{3+}$

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412. Using IUPAC norms write the systematic names of the following:

$\left[Ti\left(H_2O\right)_6\right]^{3+}$

Watch Video Solution

413. Using IUPAC norms write the systematic name of the following :

$\left[NiCl_4\right]^{2-}$

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414. Using IUPAC norms write the systematic names of the following:

$\left[Ni(CO)_4\right]$

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415. List various types of isomerism possible for coordination compounds, giving an example of each.

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416. How many geometrical isomers are possible in the following coordination entities: `[Cr(C_2O_4)_3]^3-

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417. How many geometrical isomers are possible in the following co-ordination entity?

$\left[Co\left(NH_3\right)_3Cl_3\right]$

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418. Draw the structures of optical isomers of: $\left[Cr\left(C_2O_4\right)_3\right]^3$ -

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419. Draw the structures of optical isomers of: $\left[PtCl_2(en)_2\right]^{2+}$

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420. Draw the structures of optical isomers of : $Cr\left(NH_3\right)_2Cl_2(en)]^+$

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421. Predict the number of different types of isomers for the following complex : $\left[CoCl_2(en)_2\right]^+$

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422. Draw all the isomers (geometrical and optical) of: $\left[Co\left(NH_3\right)Cl(en)_2\right]^{2+}$

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423. Draw all the isomers (geometrical and optical) of: $\left[Co\left(NH_3\right)_2Cl_2(en)\right]^+$

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424. Write all the geometrical isomers of $\left[Pt\left(NH_3\right)(Br)(Cl)(py)\right]$ and how many of these will exhibit optical isomers?

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425. Aqueous copper sulphate solution (blue in colour) gives: a green precipitate with aqueous potassium fluoride

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426. Aqueous copper sulphate solution (blue in colour) gives: a bright green solution with aqueous potassium chloride. Explain these experimental results.

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427. $\left[Fe(CN)_6\right)]^{4-}$ and $\left[Fe\left(H_2O\right)_6\right)]^{2+}$ are of different colours in dilute solutions. Why ?

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428. Discuss the nature of bonding in metal carbonyls.

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429. Give the oxidation state, d orbital occupation and coordination number of the central metal ion in the following complexes: $K_3\left[Co\left(C_2O_4\right)_3\right]$

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430. Give the oxidation state, d orbital occupation and coordination number of the central metal ion in the following complexes: $\left(NH_4\right)_2\left[CoF_4\right]$

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431. Give the oxidation state, d orbital occupation and coordination number of the central metal ion in the following complexes: $cis\text{ - }\left[CrCI_2\right)en)_2\Big]CI$

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432. Give the oxidation state, d orbital occupation and coordination number of the central metal ion in the following complexes: $\left[Mn\left(H_2O\right)_6\right]SO_4$

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433. Write down the IUPAC name for each of the following complexes and indicate the oxidation state, electronic configuration and coordination number. Also give stereochemistry and magnetic moment of the complex: $K\left[Cr\left(H_2O\right)_2\left(C_2O_4\right)_2\right].3H_2O$

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434. Write down the IUPAC name of the following complex and indicate the oxidation state, electronic configuration and coordination number. Also give stereochemistry and magnetic moment of the complex : $CrCl_3(py)_3$

Watch Video Solution

435. Write down the IUPAC name for each of the following complexes and indicate the oxidation state, electronic configuration and coordination number. Also give stereochemistry and magnetic moment of the complex: $K_4\left[Mn(CN)_6\right]$

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436. Write down the IUPAC name for each of the following complexes and indicate the oxidation state, electronic configuration and coordination number. Also give stereochemistry and magnetic moment of the complex: $\left[Co\left(NH_3\right)_5CI\right]CI_2$

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437. Write down the IUPAC name for each of the following complexes and indicate the oxidation state, electronic configuration and

coordination number. Also give magnetic moment of the complex: $Cs\left[FeCI_4\right]$

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438. What is meant by stability of a coordination compound in solution? State the factors which govern

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439. What is meant by the chelate effect? Give an example.

Watch Video Solution

440. Discuss briefly giving an example in each case the role of coordination compunds in: biological systems

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441. Discuss briefly giving an example in each case the role of coordination compunds in: analytical chemistry

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442. Discuss briefly giving an example in each case the role of coordination compunds in: medicinal chemistry and

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443. Discuss briefly giving an example in each case the role of coordination compunds in: extraction/metallurgy of metals

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444. How many ions are produced from the complex

$$\left[Co\left(NH_3\right)_6\right]Cl_2$$

in solution ?

A. 6

B. 4

C. 3

D. 2

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445. Amongst the following ions which one has the highest magnetic moment value ?

A. $\left[Cr\left(H_2O\right)_6\right]^{3+}$

B. $\left[Fe\left(H_2O\right)_6\right]^{2+}$

C. $\left[Zn\left(H_2O\right)_6\right]^{2+}$

D.

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446. The oxidation number of cobalt in $K\left[Co(CO)_4\right]$ is

A. $+1$

B. $+3$

C. -1

D. -3

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447. Amongst the following, the most stable complex is

A. $\left[Fe\left(H_2O\right)_6\right]^{3+}$

B. $\left[Fe\left(NH_3\right)_6\right]^{3+}$

C. $\left[Fe\left(C_2O_4\right)_3\right]^{3-}$

D. $\left[FeCl_6\right]^{3-}$

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448. What will be the correct order for the wavelengths of absorption in the visible region for the following: $\left[Ni\left(NO_2\right)\right)6]^{4-}$, $\left[Ni\left(NH_3\right)_6\right]^{2+}$, $\left[Ni\left(H_2O\right)_6\right]^{2+}$?

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449. Arrange the following complexes in the increasing order of conductivity of their solution: $\left[Co\left(NH_3\right)_3Cl_3\right]$, $\left[Co\left(NH_3\right)_4Cl_2\right]Cl$, $\left[Co\left(NH_3\right)_6\right]Cl_3$, $\left[Cr\left(NH_3\right)_5Cl\right]Cl_2$

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450. A coordination compound $CrCl_3.4H_2O$ precipitates silver chloride with $AgNO_3$. The molar conductivity of the solution corresponds to a total number of two ions. Write structural formula of the compound and name it.

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451. A complex of the type $\left[M(AA)_2X_2\right]^{n+}$ is known to be optically active. What does this indicate about the structure of the complex? Give an example of such complex.

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452. Magnetic moment of $\left[MnCl_4\right]^{2-}$ is 5.92 BM. Explain giving reason.

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453. On the basis of crystal field theory explain why Co(III) forms paramagnetic octahedral complex with weak field ligands whereas it forms diamagnetic octahedral complex with strong field ligands.

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454. Why are low spin tetrahedral complexes not formed ?

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455. Give the electronic configuration of the following complexes on the basis of Crystal Field Splitting theory. $\left[CoF_6\right]^{3-}$, $\left[Fe(CN)_6\right]^{4-}$ and $\left[Cu\left(NH_3\right)_6\right]^{2+}$.

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456. Explain why $\left[Fe\left(H_2O\right)_6\right]^{3+}$ has magnetic moment value of 5.92 B.M. whereas $\left[Fe(CN)_6\right]^{3-}$ has a value of only 1.74 BM.

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457. Arrange following complex ions in increasing order of crystal field splitting energy $\left(\Delta_0\right)$: $\left[Cr\left(Cl_6\right]^{3-}\right.$, $\left[Cr(CN)_6\right]^{3-}$, [Cr(NH_3)_6]^(3+)`.

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458. Why do compounds having similar geometry have different magnetic moment ?

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459. $CuSO_4.5H_2O$ is blue in colour while $CuSO_4$ is colourless. Why ?

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460. Name the type of isomerism when ambidentate ligands are attached to central metal ion. Give two examples of ambidentate ligands.

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461. Why $Cu(OH)_2$ is soluble in NH_4OH but not in NaOH solution ?

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462. Express 2203 in roman numbers.

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463. Slaked lime is-

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464. Express 1226 in roman numbers.

Watch Video Solution

465. Express 2207 in roman numbers.

Watch Video Solution

466. Express 2208 in roman numbers.

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467. $\left[Ti\left(H_2O\right)_6\right]^{3+}$ absorbs light of a wavelength 500 nm. Name one ligand which would form Ti(IID) complex absorbing light of lower wavelength than 500 nm and one ligand which would form acomplex absorbing light of wavelength higher than 500 nm.

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468. The chemical formula of hydrated lime is-

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469. Dimethyl giyoxime is added to alcoholic solution of $NiCl_2$. When ammonium hydroxide is slowly added to it, a rosy red precipitate of a complex is formed. Write the structural formula of the complex.

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470. Dimethyl giyoxime is added to alcoholic solution of $NiCl_2$. When ammonium hydroxide is slowly added to it, a rosy red precipitate of a complex is formed. Write the structural formula of the complex.

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471. Express 2210 in roman numbers.

Watch Video Solution

472. Express 2211 in roman numbers.

Watch Video Solution

473. Calcium dihydrogen salt of EDTA is used as an antidote for lead poisoning, why ?

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474. True of False : $CuCl_4^{2-}$ exists but CuI_4^{2-} does not.

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475. A coordination compound has the formula $CoCl_3.4NH_3$. It precipitates silver ions as AgCl and its molar conductance

corresponds to a total of two ions. Deduce its structural formula and name the complex.

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476. A coordination compound has the formula $CoCl_3.4NH_3$. It precipitates silver ions as AgCl and its molar conductance corresponds to a total of two ions. Deduce its structural formula and name the complex.

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477. A coordination compound has the formula $CoCl_3.4NH_3$. It precipitates silver ions as AgCl and its molar conductance corresponds to a total of two ions. Replace ammonia molecules by two molecules of ethylenediamine and discuss isomerism in the resulting complex ion.

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478. Express 2212 in roman numbers.

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479. A Compound with the empirical formula $Co\left(NH_3\right)_5BrSO_4$ exists in two forms : red and violet. Solution of red gives a precipitate of AgBr on addition of $AgNO_3$. The violet form Sives no precipitate on the addition at $AgNO_3$ but gives a white precipitate on addition of $BaCl_2$ solution. From these observations draw the structure of each compound and explain the observations.

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480. The complex $CoBr_3.4NH_3.2H_2O$ has molar conductivity corresponding to 1:3 electrolyte, Write the molecular formula and its

IUPAC name.

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481. Name a hexadentate ligand and write the formula of its complex with Co(III) . Draw its structure.

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482. Oxalic acid is commonly used to remove rust stains. Justify.

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483. Why is $K_4\left[Fe(CN)_6\right]$ not toxic whereas KCN is highly toxic ?

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EXERCISE

1. What is the coordinate number of the central metal ions in the following coordination compound ?

$\left[PtCl_2(en)_2\right]$

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2. What is the coordinate number of the central metal ions in the following coordination compound ?

$\left[Ni(CN)_4\right]^{-2}$

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3. What is the coordination number of Fe in $[Fe(EDTA)]^-$?

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4. What is the coordinate number of the central metal ions in the following coordination compound ?

$\left[Fe(en)_3\right]Cl_3$

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5. What is the coordinate number of the central metal ions in the following coordination compound ?

$\left[Mo(CN)_8\right]^{4-}$

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6. What is the coordinate number of the central metal ions in the following coordination compound ?

$Fe(CO)_5$

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7. What is the coordinate number of the central metal ions in the following coordination compound ?

$$\left[Rh\left\{P\left(C_6H_5\right)\right\}_3\right]Cl$$

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8. What is the coordinate number of the central metal ions in the following coordination compound ?

$$K_3\left[Fe\left(C_2O_4\right)_3\right]$$

Watch Video Solution

9. What is the oxidation state of iron in the following ?

$$\left[Fe(CN)_6\right]^{3-}$$

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10. What is the oxidation state of iron in the following ?

$K_4\left[Fe(CN)_6\right]$

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11. What is the oxidation state of iron in the following ?

$Fe(CO)_5$

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12. What is the oxidation state of iron in the following ?

$\left[Fe\left(H_2O\right)_6\right]^{3+}$

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13. Specify the oxidation numbers of the metals in the following coordination entities: $\left[Co\left(H_2O\right)(CN)(en)_2\right]^{2+}$

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14. Specify the oxidation numbers of the metals in the following coordination entities: $\left[Cr\left(NH_3\right)_3Cl_3\right]$

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15. Specify the oxidation numbers of the metals in the following coordination entities: $\left[CoBr_2(en)_2\right]^{+}$

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16. Specify the oxidation numbers of the metals in the following coordination entities: $\left[PtCl_4\right]^{2-}$

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17. Specify the oxidation numbers of the metals in the following coordination entities: $K_3\left[Fe(CN)_6\right]$

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18. Calculate the oxidation state of the central metal atom in the following : $[Fe(EDTA)]^-$

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19. Calculate the oxidation state of the central metal atom in the following : $\left[Co\left(NO_2\right)_2\left(C_5H_5N\right)_2\left(NH_3\right)_2\right]NO_3$

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20. Calculate the oxidation state of the central metal atom in the following : $K_4\left[Ni(CN)_4\right]$

Watch Video Solution

21. Calculate the oxidation state of the central metal atom in the following : $Na\left[Co(CO)_4\right]$

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22. Indicate the oxidation state of the central metal in the following complex : $\left[PdI_2(ONO)_2\left(H_2O\right)_2\right]$

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23. Which of the following is expected to be more stable : $\left[Co(en)_3\right]^{3+}$ or $\left[Co\left(NH_3\right)_6\right]^{3+}$?

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24. Write the formulae of the following coordination compound : hexaamminecobalt (III) sulphate.

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25. Using IUPAC norms write the formulas for the following: Potassium tetrachloridopalladate(II)

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26. Write the formulas for the following coordination compounds: Amminebromidochloridonitrito-N-platinate(II)

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27. Using IUPAC norms write the formulas for the following: Pentaaminenitrito-O-coblt (III)

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28. Using IUPAC norms write the formulas for the following: Pentaaminenitrito-O-coblt (III)

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29. Using IUPAC norms write the formulas for the following: Tetrabromidocuprate (II)

Watch Video Solution

30. Write the formulae of the following coordination compound : hexaammineplatinum (IV).

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31. Write the formulas for the following coordination compounds: Potassium tetracyanidonickelate(II)

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32. Write the formulas for the following coordination compounds: Potassium trioxalatoaluminate(III)

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33. Write the formulas for the following coordination compounds: Tetracarbonylnickel(O)

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34. Write IUPAC name of the following

$K_3\left[Al\left(C_2O_4\right)\right]_3$

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35. Using IUPAC norms write the systematic names of the following:

$\left[Ni(CO)_4\right]$

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36. Express 3157 in roman numbers.

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37. Write the IUPAC name of $\left[CoCl\left(NH_3\right)_5\right]Cl_2$.

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38. Write IUPAC Name of Complexe : $\left[PtCl_2\left(C_5H_5N\right)\left(NH_3\right)\right]$

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39. Choose correct option- Out of these, which alloy is made up of 90% of copper and 10% of aluminium?

A. Coin metal

B. Bronze

C. Artificial gold

D. Bell metal

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40. Write IUPAC name of the following : $\left[Cr\left(NH_3\right)_3Cl_3\right]$

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41. Write IUPAC name of the following : $K_3\left[Fe(CN)_6\right]$

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42. Write IUPAC name of the following : $Na_3\left[AlF_6\right]$

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43. Express 1036 in roman numbers.

Watch Video Solution

44. Express 1385 in roman numbers.

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45. Is the following name is correct ?

$\left[Ag(CN)_2\right]^-$: dicyanosilver (I) ion.

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46. Express 1387 in roman numbers.

Watch Video Solution

47. Write the IUPAC name of $K_3\left[Fe(CN)_5NO\right]$.

Watch Video Solution

48. Is the following name is correct ?

$\left[Co(ONO)\left(NH_3\right)_5\right]SO_4$: pentaamminenitrito-O-cobalt (III) sulphate.

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49. Is the following name is correct ?

$K_3\left[Al\left(C_2O_4\right)_3\right]$: potassium tris(oxalato)aluminate (III).

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50. Express 1510 in roman numbers.

Watch Video Solution

51. Express 1511 in roman numbers.

Watch Video Solution

Watch Video Solution

52. Express 1512 in roman numbers.

Watch Video Solution

53. Express 1513 in roman numbers.

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54. What type of isomerism is shown by the following complex , $\left[Co\left(NH_3\right)_6\right]\left[Cr(CN)_6\right]$?

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55. Namethetype of isomerism exhibited bythe following pair of isomers. $\left[Co\left(NH_3\right)_5\left(NO_2\right)\right]Cl_2$ and $\left[Co\left(NH_3\right)_5(ONO)\right]Cl_2$

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56. What type of isomerism is exhibited by the following complex : $\left[CO\left(NH_3\right)_5SO_4\right]Cl$

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57. Express 1515 in roman numbers.

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58. Which of the following exhibit geometrical isomerism ?

A. $\left[CoCl_2(en)_2\right]^+$

B. $\left[PtCl\left(NH_3\right)_3\right]$

C. Tetrahedral $\left[CoBrCl\left(NH_3\right)_2\right]$

D. $\left[RhCl_3\left(NH_3\right)_3\right]$

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59. The IUPAC name of $\left[Co(Cl)\left(NO_2\right)(en)_2\right]Cl$ is

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60. The IUPAC name of $\left[Co\left(NH_3\right)_6\left[Cr(CN)_6\right]\right.$ is :

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61. The IUPAC name of $\left[Co(Cl)\left(NO_2\right)(en)_2\right]Cl$ is

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62. How many geometrical isomers are possible in the following coordination entities: `[Cr(C_2O_4)_3]^3-

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63. How many geometrical isomers are possible in the following co-ordination entity?

$\left[Co\left(NH_3\right)_3Cl_3\right]$

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64. Write the name of ionisation isomer of the compound $\left[Co\left(NH_3\right)_5Br\right]SO_4$.

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65. Namethetype of isomerism exhibited bythe following pair of isomers. $\left[Co\left(NH_3\right)_5\left(NO_2\right)\right]Cl_2$ and $\left[Co\left(NH_3\right)_5(ONO)\right]Cl_2$

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66. Write the IUPAC names of the following coordination compounds:

$\left[CO\left(NH_3\right)_6\right]CI_3$

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67. Name the following- Ammonal is a mixture of one fuel and one oxidizer.

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68. True or False : All inner orbital complexes are diamagnetic.

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69. Complete the following statement- Aquaregia is-

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70. Explain the following statement- Monel metal is anti corrosive in nature.

Watch Video Solution

71. Describe the following statement in brief- Aquaregia is used to dissolve gold metal.

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72. Describe the following statement- Monel metal is used in marine engineering.

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73. True of False : $CoCl_3.3NH_3$ complex is non-conducting.

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74. What is the oxidation state of iron in the following ?

$Fe(CO)_5$

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75. Describe the following statement in brief- Magnalium is used in aviation engineering.

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76. Describe the following statement- Duralumin is used to make pressure cookers.

Watch Video Solution

77. Discuss how magnelium is formed?

Watch Video Solution

78. Describe the following statement in brief- Gun metal is used to make guns.

Watch Video Solution

79. Write the name of linkage isomer of the compound $\left[CO\left(NH_3\right)_5\left(NO_2\right)\right]Cl_2$

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80. How does valence bond theory account for: $\left[Ni\left(Cl_4\right)\right]^{2-}$ is diamagnetic and tetrahedral (At number of Ni = 28)

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81. The correct IUPAC name of $\left[Pt\left(NH_3\right)_2Cl_2\right]$ is:

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82. The formula of the complex sodium tetracarbonyl cobaltate (-1) is ..... .

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83. The metal present in vitamin B_{12} is ..... and the metal present in chlorophyll is ..... .

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84. What is the composition of Sacagawea dollar?

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85. The oxidation state of nickel in $K_4\left[Ni(CN)_4\right]$ is ..... .

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86. The coordination number of chromium in $\left[Cr(en)_2\left(NH_3\right)(NCS)\right]$ is ..... .

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87. Describe the following statement- Zinc sulphate heptahydrate is used as fungicide.

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88. Describe the following statement in brief- A mixture of zinc sulphide and barium sulphate is used in inks and face powder.

Watch Video Solution

89. In the complex [Co(EDTA)] the coordination number of cobalt is ..... .

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90. Complete the following statement- White vitriol is-

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91. In octahedral crystal field splitting, the three orbitals are called ..... and two orbitals are called ..... .

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92. The spin magnetic moment of the complex $\left[Fe(CN)_6\right]^{4-}$ is ..... .

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93. Describe the following statement- Gun powder is used in military purposes.

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94. Choose the correct alternative : The complex $\left[Ni(CO)_4\right]$ is square planar / tetrahedral.

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95. What is the composition of Gobar gas?

Watch Video Solution

96. Triethylene tetraammine is a tridentate /tetradentateligand.

Watch Video Solution

97. On reaction with silver nitrate solution, the complex $CoCl_3.4NH_3$ gives precipitates corresponding to one/two chloride ions.

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98. Explain the following statement- A gas is used as a domestic fuel.

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99. The compounds $\left[Co(CN)\left(NH_3\right)_5\right]Cl_2$ and $\left[Co(NC)\left(NH_3\right)_5\right]Cl_2$ are examples of

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100. Out of cis and trans form of $\left[RhCl_2(en)_2\right]^+$, cis/trans form shows optical activity.

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101. The magnetic moment of ferricyanide ion is more/less than that of ferrocyanide ion.

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102. How does valence bond theory account for: $\left[Ni\left(Cl_4\right)\right]^{2-}$ is diamagnetic and tetrahedral (At number of Ni = 28)

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103. Why are low spin tetrahedral complexes not formed ?

Watch Video Solution

104. haemoglobin is a :

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105. HI is stronger /weaker acid than HCl.

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106. Name central metal atom present in haemoglobin and Vitamin B_{12}.

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107. Give one example of a neutral detergent..

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108. What is meant by the chelate effect? Give an example.

Watch Video Solution

109. Write the chemical formula for the complex compound : Sodium (ethylene diammine tetra acetate) chromate(II).

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110. Write IUPAC name of $Na_3\left[Co\left(NO_2\right)_6\right]$.

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111. Give the chemical formula of the compound potassium trioxalatoferrate (III).

Watch Video Solution

112. Give the IUPAC name of the ionisation isomer of $\left[Pt\left(NO_2\right)\left(H_2O\right)\left(NH_3\right)(Cl)\right]Br.$

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113. Define co-ordination isomerism and write one co-ordination isomer of : $\left[Co\left(NH_3\right)\right]_6\left[Cr(CN)_6\right].$

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114. Write IUPAC name of $K_3\left[Fe(CN)_5NO\right]$.

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115. Write the IUPAC name of $K_2\left[Ni(CN)_4\right]$.

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116. Write the IUPAC name of $K_3\left[Cr\left(C_2O_4\right)_3\right]$.

Watch Video Solution

117. Write the IUPAC name of $\left[CoBr_2(en)_2\right]Cl$.

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118. Write the IUPAC name of the $\left[Co\left(NH_3\right)_5ONO\right]Cl_2$

Watch Video Solution

119. Write the IUPAC name of $\left[CoCl\left(NH_3\right)_5\right]Cl_2$.

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120. Write the formula of pentaaminenitrocobalt (III) chloride.

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121. Define Bidentate ligands and give example.

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122. Which of the following is expected to be more stable : $\left[Co(en)_3\right]^{3+}$ or $\left[Co\left(NH_3\right)_6\right]^{3+}$?

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123. Give an example of coordination compound used in medicines.

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124. Give an example of coordination isomerism.

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125. Give one example of linkage isomer.

Watch Video Solution

126. Give one example of ionization isomer.

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127. The coordination number of cobalt in $\left[Co(en)_3\right]^{3+}$ is

A. 3

B. 4

C. 6

D. 2

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128. Write the IUPAC name of $K_3\left[Fe(CN)_5NO\right]$.

A. potassium pentacyanonitrosylferrate (II)

B. potassium pentacyanonitroferrate (II)

C. potassium pentacyanonitrosylferrate (III)

D. tripotassium pentacyanonitrosylferrate (II)

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129. Which of the following is hexadentate ligand?

A. diene

B. CN^-

C. en

D. EDTA

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130. On adding $AgNO_3$ solution to 1 mole of $PdCl_2.4NH_3$, two moles of AgCl are formed. The secondary valency of Pd in the complex will be

A. 0

B. 2

C. 4

D. 1

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131. Express 1551 in roman numbers.

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132. Express 1552 in roman numbers.

Watch Video Solution

133. Express 1553 in roman numbers.

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134. Which is present in metal carbonyls?

A. M-C σ bond

B. M-C π bond

C. M-C σ and M-C π bond

D. None of these

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135. How many ions are given by $\left[Co\left(NH_3\right)_5Br\right]Cl_2$ complex in water?

A. 4

B. 2

C. 6

D. 3

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136. The metals used in the formation of Brass are-

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137. Express 1555 in roman numbers.

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138. Express 1556 in roman numbers.

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139. Express 1557 in roman numbers.

Watch Video Solution

140. Express 1558 in roman numbers.

Watch Video Solution

141. Express 1560 in roman numbers.

Watch Video Solution

142. Express 1561 in roman numbers.

Watch Video Solution

143. Express 1562 in roman numbers.

Watch Video Solution

144. Express 1563 in roman numbers.

Watch Video Solution

145. Express 1565 in roman numbers.

Watch Video Solution

146. Express 1566 in roman numbers.

Watch Video Solution

147. Express 1567 in roman numbers.

Watch Video Solution

148. Express 1568 in roman numbers.

Watch Video Solution

149. Express 1570 in roman numbers.

Watch Video Solution

150. Express 1571 in roman numbers.

Watch Video Solution

151. Express 1572 in roman numbers.

Watch Video Solution

152. Express 1573 in roman numbers.

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153. For the complex $\left[Fe(en)_2Cl_2\right]Cl$, identify the following : Magnetic behaviour of the complex.

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154. For the complex $\left[Fe(en)_2Cl_2\right]Cl$, identify the ligands & central atom.

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155. For the complex $\left[PtCl\left(NH_3\right)_4NO_2\right]SO_4$, identify the ligands & central atom.

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156. For the complex $K_2\left[HgCl_4\right]$, identify the ligands & central atom.

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157. For the complex $\left[CrCl_2\left(H_2O\right)_4\right]NO_3$, identify the ligands & central atom.

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158. For the complex $Na\left[Au(CN)_2\right]$, identify the ligands & central atom.

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159. For the complex $Na_3\left[Co\left(NO_2\right)_6\right]$, identify the ligands & central atom.

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160. State a reason for the following situation : The molecular shape of $Ni(CO)_4$ is not the same as that of $\left[Ni(CN)_4\right]^{2-}$?

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161. Write the IUPAC name of following :

[Cr(NH_3)_3 (H_2O)_3]Cl_3`

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162. For the complex $K_3\left[Fe(CN)_5NO\right]$ identify the cental atom and ligands.

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163. For the complex $\left[Cu\left(H_2O\right)_2\left(NH_3\right)_4\right]SO_4$ identify the ligands & central atom.

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164. trans isomer of the complex $\left[Co(en)_2Cl_2\right]^+$ is optically inactive. Why ?

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165. For the complex $K_3\left[Fe\left(C_2O_4\right)_3\right]$ identify the ligands & central atom.

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166. For the complex $K_4\left[Ni(CN)_4\right]$ identify the ligands & central atom.

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167. Write IUPAC name of the following : $\left[Cr\left(NH_3\right)_3Cl_3\right]$

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168. Write IUPAC name of the following : $K_3\left[Fe(CN)_6\right]$

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169. Write the IUPAC name of the compound : $\left[CoBr_2(en)_2\right]^+$ (en = ethylenediamine)

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170. What type of isomerism is exhibited by the following complex : $\left[CO\left(NH_3\right)_5SO_4\right]Cl$

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171. What type of isomerism is exhibited by the complex $\left[Co(en)_3\right]^{3+}$?

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172. What type of isomerism is shown by the following complex , $\left[Co\left(NH_3\right)_6\right]\left[Cr(CN)_6\right]$?

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173. Give the enantiomers of $\left[CoBr_2(en)_2\right]^+$.

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174. Draw the geometrical isomers of $\left[Co(en)_2CI_2\right]^+$ ion.Which of these is optically active ?

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175. Which of the following is expected to be more stable : $\left[Co(en)_3\right]^{3+}$ or $\left[Co\left(NH_3\right)_6\right]^{3+}$?

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176. Write the IUPAC name of the complex $\left[Cr\left(NH_3\right)_4Cl_2\right]^+$ .What type of isomerism does it exhibit ?

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177. Write two difference between double salt and complex compound.

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178. What is spectrochemical series?

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179. Write the formulae of the following using IUPAC rules: Potassium tatrachloridonickelate (II).

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180. Write the formulae of the following using IUPAC rules: Diamminechloridonitrito-N -platinum (II).

Watch Video Solution

181. For the complex $\left[CoBr_2(en)_2\right]Cl$ identify the ligands & central atom.

Watch Video Solution

182. For the complex $K_3\left[Cr\left(C_2O_4\right)_3\right]$ identify the ligands & central atom.

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183. Primary valency of central metal atom/ion in $\left[Co\left(NH_3\right)_6\right]Cl_3$.

A. 3

B. 6

C. 4

D. 9

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184. Discuss the main postulates of Werner's coordination theory.

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185. Write the IUPAC name of $K_3\left[Fe(CN)_6\right]$, [Co(NH_3)_6]Cl_3` .

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186. predict the number of unpaired electrons in $\left[CoF_6\right]^{3-}$ and $\left[Co\left(NH_3\right)_6\right]^{3+}$

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187. Find the oxidation number of central atom : $\left[Pt\left(NH_3\right)_2Cl_2\right]$.

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188. On the basis of crystal field theory, write the electronic configuration of d^4 ion if $\Delta_0 < P$.

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189. Write the hybridization and magnetic behaviour of the complex $\left[Ni(CO)_4\right]$. (At no. if Ni=28).

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190. Find the oxidation number of central atom : . $\left[Cr\left(NH_3\right)_2Cl_2(en)\right]Cl$

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191. Using IUPAC norms write the formulas for the following: Pentaaminenitrito-O-coblt (III)

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192. Find the oxidation number of Co in following coordination compound : $\left[Co\left(H_2O\right)_3BrClNO_2\right]$

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193. Write the IUPAC name of the following coordination compound : $K_3\left[Cr\left(C_2O_4\right)_3\right]$

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194. Define the following term : Co - ordination number

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195. Explain with two examples the following

Coordination sphere.

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196. Give an example of coordination compound used in medicines.

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197. Onthe basis of valencebondtheory explain the structure andmagnetic nature of $\left[Ni(CN)_4\right]^{2-}$ complex ion.

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198. Discuss how duralumin is formed?

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199. Write a note on geometrical isomerism.

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200. On the basis of VBT, show that $\left[CoF_6\right]^{3-}$ is paramagnetic.

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201. Write the IUPAC name of the following compound:

$\left[\left(Cr\left(NH_3\right)_4Cl_2\right]Cl\right.$

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202. Write the shape and magnetic behaviour of the following complex : $\left[Co\left(NH_3\right)_6\right]^{3+}$

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203. Write the shape and magnetic behaviour of the following complex : $\left[Ni(CN)_4\right]^{2-}$

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204. Write the formula of lithium tetrahydridoalumniate (III).

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205. Express 1575 in roman numbers.

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206. Express 1576 in roman numbers.

Watch Video Solution

207. Express 1577 in roman numbers.

Watch Video Solution

208. Express 1578 in roman numbers.

Watch Video Solution

209. Express 1580 in roman numbers.

Watch Video Solution

210. Express 1581 in roman numbers.

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211. Express 1582 in roman numbers.

Watch Video Solution

212. Express 1583 in roman numbers.

Watch Video Solution

213. Express 1585 in roman numbers.

Watch Video Solution

214. Express 1586 in roman numbers.

Watch Video Solution

215. Express 1587 in roman numbers.

Watch Video Solution

216. Express 1588 in roman numbers.

Watch Video Solution

217. Express 1000 in roman numbers.

Watch Video Solution

218. Express 1601 in roman numbers.

Watch Video Solution

219. Express 1602 in roman numbers.

Watch Video Solution

220. Express 1603 in roman numbers.

Watch Video Solution

221. Express 1605 in roman numbers.

Watch Video Solution

222. Express 1606 in roman numbers.

Watch Video Solution

223. Express 1607 in roman numbers.

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224. Find the oxidation number of central atom : $\left[Ni(CN)_4\right]^{2-}$

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225. Express 1608 in roman numbers.

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226. Account for the different magnetic behaviour of $\left[Co\left(CN_6\right)\right]^{3-}$ and $\left[CoF_6\right]^{3-}$.

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227. Which of the following shall form an octahedral complex?

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228. Find the oxidation number of central atom : $\left[Co(CN)_6\right]^{-3}$

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229. Find the oxidation number of central atom : . $\left[Co\left(NH_3\right)_4\left(H_2O\right)_2\right]Cl_2$

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230. Find the oxidation number of central atom : . $\left[Co\left(NH_3\right)_5Cl\right]^{+2}$

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231. Explain the following case giving appropriate reason : The π-complexes are known for the transition metals only.

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232. Find the oxidation number of central atom : $\left[Ni\left(NH_3\right)_6\right]^{+2}$

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233. Write the state of hybridization, the shape and the magnetic behaviors of the following complex entities : $\left[Cr\left(NH_3\right)_4Cl_2\right]Cl$

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234. Find the oxidation number of Co : $\left[Co(en)_3\right]Cl_3$

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235. Find the oxidation number of nickel (Ni) in following compound : $K_2\left[Ni(CN)_4\right]$.

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236. Draw the structures of optical isomers of: $\left[PtCl_2(en)_2\right]^{2+}$

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237. Find the oxidation number of central atom : $\left[Cr\left(C_2O_4\right)_3\right]^{3-}$

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238. Draw the structures of optical isomers of: $\left[Cr\left(C_2O_4\right)_3\right]^{3-}$

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239. Find the oxidation number of central atom : $\left[Fe(CN)_6\right]^{4-}$

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240. Find the oxidation number of central atom : $\left[Cr\left(NH_3\right)_4Cl_2\right]^{+}$

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241. Name the following coordination entities and describe their structures : $\left[Ni(CN)_4\right]^{2-}$ (Atomic number : Ni = 28)

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242. For the complex $\left[NiCl_4\right]^{2-}$, write the IUPAC name. (Atomic no. of Ni = 28)

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243. For the complex $\left[NiCl_4\right]^{2-}$, write the hybridisation type. (Atomic no. of Ni = 28)

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244. For the complex $\left[NiCl_4\right]^{2-}$,write)the shape of the complex.

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245. Find the oxidation number of central atom : $\left[Co\left(NH_3\right)_5\left(NO_2\right)\right]\left(NO_3\right)_2$.

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246. Write the formula for the following complex : Potassium tetracyanonickelate (II)

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247. Draw the geometrical isomers of $\left[Co(en)_2CI_2\right]^+$ ion.Which of these is optically active ?

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248. Find the oxidation number of central atom : $\left[NiCl_2\left(PPh_3\right)_2\right]$

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249. Write the formula of the following coordination compound : potassium tetrachloridozincate(II)

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250. When a coordination compound $CrCl_3.6H_2O$ is mixed wih $AgNO_3$, 2 moles of AgCl are precipitated per mole of the compound. Write Structural formula of the complex.

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251. When a coordination compound $CrCl_3.6H_2O$ is mixed wih $AgNO_3$, 2 moles of AgCl are precipitated per mole of the compound. Write Structural formula of the complex.

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252. Write the formula of the following coordination compound : ammineaquadibromidocopper(II)

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253. Write the formula of the following coordination compound : potassium tetracyanidocuperate(II)

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254. Write the IUPAC name of $\left[Cu\left(H_2O\right)_2\left(NH_3\right)_4\right]SO_4$.

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255. What is the state of hybridisation and geometry in `[Ni(CN)_4]^(-2_)

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256. Define optical isomerism. Give one example of optical isomers.

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257. $\left[Ti\left(H_2O\right)_6\right]^{3+}$ is coloured while $\left[Sc\left(H_2O\right)_6\right]^{3+}$ is colourless. Explain.

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258. Explain : $\left[Co(CN)_6\right]^{3-}$ is diamagnetic while $\left[CoF_6\right]^{3-}$ is paramagnetic.

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259. Write the IUPAC name of the following :

$\left[Co\left(NH_3\right)_4\left(H_2O\right)(Cl)\right]Cl_2$

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260. Write IUPAC name of the following

$K_2\left[Zn(OH)_4\right]$

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261. Write IUPAC name of the following : $\left[Ag\left(NH_3\right)_2\right]\left[Ag(CN)_2\right]$

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262. Explain $\left[Co\left(NH_3\right)_6\right]^{3+}$ is an inner orbital complex whereas $\left[Ni\left(NH_3\right)\right)6]^{2+}$ is an outer orbital complex.

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263. Write IUPAC name of the following : $\left[Ni(CO)_4\right]$

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264. Write IUPAC name of the following

$K_3\left[Cr\left(C_2O_4\right)_3\right]$

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265. Write IUPAC name of the following : $\left[Pt\left(NH_3\right)_2Cl\left(NO_2\right)\right]$

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266. Explain, Why $\left[Ni(CO)_4\right]$ is diamagnetic whereas $\left[NiCl_4\right]^{2-}$ is paramagnetic ?

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267. Write the formula of the following coordination compound : amminebis(ethane-1,2-diamine)chromiuum(III)chloride

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268. Write the formula of the following coordination compound : potassium pentacyanidonitrosylferrate(II)

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269. Draw figure to show the splitting of d orbitals in an octahedral crystal field.

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270. Find the oxidation number of platinum in $\left[Pt(en)_2Cl_2\right]$

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271. Ethylenediamine is an example of:

A. monodentate ligand

B. bidentate ligand

C. tridentate ligand

D. polydentate ligand.

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272. How many ions are produced from $\left[Co\left(NH_3\right)_5H_2O\right]Cl_3$ in solution ?

A. 6

B. 4

C. 3

D. 2

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273. What is the oxidation state of iron in $K_3\left[Fe(CN)_6\right]$?

A. $+2$

B. $+3$

C. $+4$

D. -3

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274. What is the oxidation state of cobalt Co in $\left[CoBr\left(NH_3\right)_5\right]SO_4$

A.

B.

C.

D.

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275. The colour of tetraamminecopper (II) sulphate is:

A. blue

B. red

C. violet

D. green.

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276. Vitamine B_{12} contains

A. magnesium

B. cobalt

C. iron

D. nickel.

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277. In which of the following the magnetic character is not correct ?

A. $CuCl_4^{2-}$: 1 unpaired electron

B. $\left[Fe\left(H_2O\right)_6\right]^{2+}$: 5 unpaired electrons

C. $\left[Zn\left(NH_3\right)_2\right]^{2+}$: Diamagnetic

D. $\left[CoF_6\right]^{3-}$: 4 unpaired electrons

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278. Wilkinson's catalyst used as a homogeneous catalyst in the hydrogenation of alkenes contains :

A. iron

B. aluminium

C. rhodium

D. cobalt.

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279. How many EDTA molecules are required to make an octahedral complexd with Ca^{2+} ion ?

A. Three

B. One

C. Two

D. Six

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280. Which of the following is not true for CoF_6^{3-} ?

A. It is paramagnetic due to the presence of 4 unpaired electrons

B. It has coordination number of 6

C. It is outer orbital complex

D. It involved d^2sp^3 hybridisation

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281. How many ions are produced from $\left[Co\left(NH_3\right)_5Cl\right]Cl_2$ in solution ?

A. 2

B. 5

C. 3

D. 0

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282. How many ions are produced from $\left[Ag\left(NH_3\right)_2\right]Cl$ in solution ?

A. 2

B. 3

C. 4

D. 5

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283. How many ions are produced from $\left[Pt\left(NH_3\right)_2Cl_2\right]Br$ in solution ?

A. 1

B. 2

C. 3

D. 4

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284. How many ions are produced from $\left[Pt\left(NH_3\right)_3Cl_3\right]Cl$ in solution ?

A. 0

B. 1

C. 2

D. 3

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285. The oxidation number of Ti is in following coordination compound $\left[TiF_6\right]^{3-}$

A.

B.

C.

D.

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286. Find the oxidation number of Ni $\left[Ni(CN)_3Cl\right]^{2-}$

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287. Find the oxidation number of cobalt in $K\left[Co(CO)_3NH_3\right]$

A.

B.

C.

D.

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288. Find the oxidation number of Pd in $\left[Pd(ONO)_2I_2\left(H_2O\right]\right.$

A.

B.

C.

D.

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289. Find the oxidation number of Ni in $K_4\left[Ni(CN)_4\right]$

A.

B.

C.

D.

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290. Which of the following is expected to be a paramagnetic complex ?

A. $\left[Ni\left(H_2O\right)_6\right]^{2+}$

B. $\left[Ni(CO)_4\right]$

C. $\left[Zn\left(NH_3\right)_2\right]^{2+}$

D. $\left[Co\left(NH_3\right)_6\right].$

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291. The oxidation number of cobalt in $K\left[Co(CO)_4\right]$ is

A. $+1$

B. $+3$

C. -1

D. -3

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292. Which of the following is paramagnetic

A. $\left[Ni(CO)_4\right]$

B. $\left[Co\left(NH_3\right)_6\right]^{3+}$

C. $\left[Ni(CN)_4\right]^{2-}$

D. $\left[NiCl_4\right]^{2-}$

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293. The oxidation state of Fe in the brown ring complex $\left[Fe\left(H_2O_5\right)NO\right]SO_4$ is

A. $+1$

B. $+2$

C. $+3$

D. $+4$

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294. The IUPAC name of the complex $\left[P\left(NH_3\right)_3Br\left(NO_2\right)Cl\right]Cl$ is

A. Triamminechlorobromonitroplatinum (IV) chloride

B. Triamminebromonitrochloroplatinum (IV) chloride

C. Triamminebromidochloridonitroplatinum (IV) chloride

D. Triamminenitrochlorobromoplatinum (IV) chloride

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295. A coordination complex compound of cobalt has molecular formula containing five ammonia molecules, one nitro group and two chlorine atoms for one cobalt atom. One mole of this compound produces three mole ions in an aqueous solution. On reacting this solution with excess of silver nitrate solution, two moles of AgCl get precipitated. The formula of this compound would be

A. $\left[Co\left(NH_3\right)_4\left(NO_2\right)Cl\right]\left[NH_3\right)Cl\right]$

B. $\left[Co\left(NH_3\right)_5Cl\right]\left[Cl\left(NO_2\right)\right]$

C. $\left[Co\left(NH_3\right)_5\left(NO_2\right)\right]Cl_2$

D. $\left[Co\left(NH_3\right)_5\right]\left[\left(NO_2\right)Cl_2\right]$

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296. Which of the following contains maximum number of lone pairs of electrons on the central atom ?

A. $\left[Co\left(NH_3\right)_4Cl_2\right]$

B. $\left[Ni(en)NH_3\right)_4]^{2+}$

C. $\left[Ni\left(C_2O_4\right)(en)_2\right]^{2-}$

D. $\left[Cr(SCN)_2\left(NH_3\right)_4\right]^{+}$.

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297. Which statement is incorrect ?

A. $Ni(CO)_4$ - tetrahedral, paramagnetic

B. $Ni(CN)_4^{2-}$ -square planar, diamagnetic

C. $Ni(CO)_4$ -tetrahedral, diamagnetic

D. $NiCl_4^{2-}$ -tetrahedral, paramagnetic.

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298. Find the oxidation number of Fe in $[Fe(edta)]^{-1}$

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299. Find the oxidation number of Fe in $\left[Fe(en)_3\right]Cl_3$

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300. Find the oxidation number of Mo in $\left[Mo(CN)_8\right]^{-4}$

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301. Namethetype of isomerism exhibited bythe following pair of isomers. $\left[Co\left(NH_3\right)_5\left(NO_2\right)\right]Cl_2$ and $\left[Co\left(NH_3\right)_5(ONO)\right]Cl_2$

A. Linkage isomerism, ionization isomerism and geometrical isomerism

B. Ionization isomerism, geometrical isomerism and optical isomerism.

C. Linkage isomerism, geometrical isomerism and optical isomerism.

D. Linkage isomerism, ionization isomerism and optical isomerism.

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302. $\left[Cr\left(H_2O\right)_6\right]Cl_3$ (At. no. of Cr = 24) has a magnetic moment of 3.83 B.M. The correct distribution of 3d electrons in the chromium of the complex is :

A. $3d_{xy}^1, 3d_{x^2-y^2}^1, 3d_{xy}^1$

B. $3d_{xy}^1, 3d_{yz}^1, 3d_{zx}^1$

C. $3d_{xy}^1, 3d_{zy}^1, 3d_{z^2}^1$

D. $3d_{x^1-y^2}^1, 3d_{z^2}^1, 3d_{xz}^1$

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303. Find the oxidation number of Fe in $\left[Fe(CO)_5\right]$

A.

B.

C.

D.

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304. Find the oxidation number of Rh in $\left[Rh\left(PPh_3\right)\right]Cl$

A.

B.

C.

D.

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305. Write the iupac name of the following : $\left[Ti(en)_2\left(NH_3\right)_2\right]^{4+}$

A.

B.

C.

D.

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306. Write the iupac name of the following : $\left[Ag(CN)_2\right]^-$

A.

B.

C.

D.

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307. In octahedral crystal field splitting, the three orbitals are called ..... and two orbitals are called ..... .

A. $-1.2\Delta_0$

B. $-0.6\Delta_0$

C. $-1.8\Delta_0$

D. $-1.6\Delta_0 + P$

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308. The compounds $\left[Co(CN)\left(NH_3\right)_5\right]Cl_2$ and $\left[Co(NC)\left(NH_3\right)_5\right]Cl_2$ are examples of

A. Linkage isomerism

B. Ionization isomerism

C. Coordination isomerism

D. Geometrical isomerism

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309. Artificial gold Alloy is used for making-

A. Electrical wires

B. Ornaments

C. Aircrafts

D. None of the above.

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310. The d-electron configurations of Cr^{2+}, Mn^{2+}, Fe^{2+} and Co^{2+} are d^4, d^5, d^6 and d^7 respectively. Which one of the following will exhibit minimum paramagnetic behaviour ? (At. nos. Cr = 24, Mn = 25, Fe = 26, Co = 27)

A. $\left[Mn\left(H_2O\right)_6\right]^{2+}$

B. $\left[Fe\left(H_2O\right)_6\right]^{2+}$

C. $\left[Co\left(H_2O\right)_6\right]^{2+}$

D. $\left[Cr\left(H_2O\right)_6\right]^{2+}$

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311. Write the iupac name of the following : $\left[CoCl\left(NH_3\right)_5\right]Cl_2$

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312. Which one of the following is an outer orbital complex and exhibits paramagnetic behaviour ?

A. $\left[Ni\left(NH_3\right)_6\right]^{2+}$

B. $\left[Zn\left(NH_3\right)_6\right]^{2+}$

C. $\left[Cr\left(NH_3\right)_6\right]^{3+}$

D. $\left[Co\left(NH_3\right)_6\right]^{3+}$

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313. A magnetic moment of 1.73 B.M. will be shown by one among of the following

A. $TiCl_4$

B. $\left[CoCl_6\right]^{4-}$

C. $\left[Cu\left(NH_3\right)_4\right]^{2+}$

D. $\left[Ni(CN)_4\right]^{2-}$

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314. An excess of $AgNO_3$ is added to 100mL of a 0.01 M solution of dichloridotetraaquachromium (III) chloride. The number of moles of AgCl precipitated would be

A. 0.003

B. 0.01

C. 0.001

D. 0.002

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315. Choose the correct option- Bronze alloy is used in-

A. In making paints

B. In making utensils

C. In making parts of machines

D. In making guns

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316. Which of the following complexes is used to be as an anticancer agent ?

A. *mer* - $\left[Co\left(NH_3\right)_3Cl_3\right]$

B. *cis* - $\left[PtCl_2\left(NH_3\right)_2\right]$

C. *cis* - $K_2\left[PtCl_2Br_2\right]$

D. Na_2CoCl_4

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317. The name of complex $\left[Fe(CN)_6\right]^{3-}$ is

A. Tricyanoferrate (III) ion

B. Hexacyanidoferrate (III) ion

C. Hexacyanoiron (III) ion

D. Hexacyanitoferrate (III) ion

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318. What is the state of hybridisation and geometry in `[Ni(CN)_4]^(-2_)

A. d^2sp^2

B. d^2sp^3

C. dsp^2

D. sp^3

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319. The sum of coordination number and oxidation number of the metal M in the complex $\left[M(en)_2\left(C_2O_4\right)\right]Cl$ (where en is ethylenediamine) is:

A. 7

B. 8

C. 9

D. 6

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320. Number of possible isomers for the complex $\left[Co(en)_2Cl_2\right]Cl$ will be : (en = ethylenediamine)

A. 3

B. 4

C. 2

D. 1

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321. Magnetic moment 2.84 B.M. is given by: (At. nos. Ni = 28, Ti = 22, Cr = 24, Co = 27)

A. Cr^{2+}

B. Co^{2+}

C. Ni^{2+}

D. Ti^{3+}

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322. Cobalt (III) chloride forms several octahedral complexes with ammonia. Which of the following will not give test for chloride ions with silver nitrate at $25^{\circ}C$?

A. $CoCl_3.5NH_3$

B. $CoCl_3.6NH_3$

C. $CoCl_3.3NH_3$

D. $CoCl_3.4NH_3$

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323. Which of these statements about $\left[Co(CN)_6\right]^{3-}$ is true ?

A. $\left[Co(CN)_6\right]^{3-}$ has four unpaired electrons and will be in a high-spin configuration.

B. $\left[Co(CN)_6\right]^{3-}$ has no unpaired electrons and will be in a high-spin configuration.

C. $\left[Co(CN)_6\right]^{3-}$ has no unpaired electrons and will be in a low-spin configuration.

D. $\left[Co(CN)_6\right]^{3-}$ has four unpaired electrons and will be in a low-spin configuration.

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324. Which of the following has longest C-O bond length? (Free C-O bond length in CO is $1.128\overset{\circ}{A}$)

A. $\left[Fe(CO)_4\right]^{2-}$

B. $\left[Mn(CO)_6\right]^{+}$

C. $Ni(CO)_4$

D. $\left[Co(CO)_4\right]^{-}$

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325. Jahn-Teller effect is not observed in high spin complexes of

A. d^7

B. d^8

C. d^4

D. d^9

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326. When one mole of each of the following complex salts is treated with excess of $AgNO_3$, which of them gives maximum amount of AgCl ?

A. $\left[Co\left(NH_3\right)_6\right]Cl_3$

B. $\left[Co\left(NH_3\right)_5Cl\right]Cl_2$

C. $\left[Co\left(NH_3\right)_4Cl_2\right]Cl$

D. $Na_2\left[PtCl_6\right]$

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327. Choose the correct option-Bronze alloy is made up of-

A. Cu and Zn

B. Cu and Sn

C. Cu and Al

D. Cu and Ni

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328. The crystal field splitting energy for octahedral $\left(\Delta_0\right)$ and tetrahedral $\left(\Delta_t\right)$ complexes is related as

A. $\Delta t = \frac{1}{2}\Delta_0$

B. $\Delta t = \frac{4}{9}\Delta_0$

C. $\Delta t = \frac{3}{5}\Delta_0$

D. $\Delta t = \frac{2}{5}\Delta_0$

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329. Choose the correct option- Which alloy is made of 88% of Cu and 12% of Sn?

A. Brass

B. German silver

C. Artificial gold

D. Bronze

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330. Which one of the following coordination compounds is used to inhibit the growth of tumours ?

A. Trans-platin

B. EDTA complex of calcium

C. Cis-platin

D. $\left[Ni(CO)_4\right]$

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331. 0.02 mole of $\left[Co\left(NH_3\right)_5Br\right]Cl_2$ and 0.02 mole of $\left[Co\left(NH_3\right)_5Cl\right]SO_4$ are present in 200 cc of a solution X. The number of moles of the precipitates Y and Z that are formed when the solution X is treated with excess silver nitrate and excess barium chloride are respectively

A. 0.02, 0.02

B. 0.01, 0.02

C. 0.02, 0.04

D. 0.04, 0.02

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332. The hybridization of central metal ion in $K_2\left[Ni(CN)_4\right]$ and $K_2\left[NiCl_4\right]$ are respectively

A. dsp^2, sp^3

B. sp^3, sp^3

C. dsp^2, dsp^2

D. sp^3, sp^3d^2

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333. Which of the following compounds show optical isomerism ? (i) *Cis* - $\left[Co\left(NH_3\right)_4Cl_2\right]^+$ (ii) *Trans* - $\left[Co(en)_2Cl_2\right]^+$ (iii) *Cis* - $\left[Co(en)_2Cl_2\right]^+$ (iv) [Co(en)_3]^(3+)` Choose the correct answer codes given below.

A. (i) and (ii)

B. (ii) and (iii)

C. (iii) and (iv)

D. (i), (iii) and (iv)

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334. Nickel (Z = 28) combines with a uninegative monodentate ligand X to form a paramagnetic complex $\left[NiX_4\right]^{2-}$. The number of unpaired electron(s) in the nickel and geometry of this complex ion are, respectively

A. two, tetrahedral

B. one, square planar

C. two, square planar

D. one, tetrahedral

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335. Brass is an alloy because it is-

A. made up of the mixture of two metals.

B. Made up of combination of two non metals

C. made by the combination of three metals.

D. made up of the combination of three non-metals.

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336. Which of the following pairs represents linkage isomers ?

A. $\left[Cu\left(NH_3\right)_4\right]\left[PtCl_4\right]$ and $\left[Pt\left(NH_3\right)_4\right]\left[CuCl_4\right]$

B. $\left[Pd\left(PPh_3\right)_2(NCS)_2\right]$ and $\left[Pd\left(PPh_3\right)_2(SCN)_2\right]$

C. $\left[Co\left(NH_3\right)_5\left(NO_3\right)\right]SO_4$ and $\left[Co\left(NH_3\right)_5\left(SO_4\right)\right]NO_3$

D. $\left[PtCl_2\left(NH_3\right)_4\right]Br_2$ and $\left[PtBr_2\left(NH_3\right)_4\right]Cl_2$

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337. A solution containing 2.675 g of $CoCl_3.6NH_3$ (molar mass = 267.5 g mol^{-1}) is passed through a cation exchanger. The chloride ions obtained in solution were treated with excess of $AgNO_3$ to give 4.78 g of AgCl (molar mass = 143.5 g mol^{-1}). The formula of the complex is : (At. mass of Ag = 108 u)

A. $\left[CoCl_3\left(NH_3\right)_3\right]$

B. $\left[CoCl\left(NH_3\right)_5\right]Cl_2$

C. $\left[Co\left(NH_3\right)_6\right]Cl_3$

D. $\left[CoCl_2\left(NH_3\right)_4\right]Cl$

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338. Choose the correct option- Bronze is an alloy because it is-

A. made up of mixture of two non metals

B. made up of two metals

C. made up of three metals.

D. made up of three non metals

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339. Choose the correct option- Which is the correct composition for artificial gold?

A. Zn and Sn

B. Cu and Al

C. Cu and Ni

D. None of the above

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340. The magnetic moment (spin only) of $\left[NiCl_4\right]^{2-}$ is

A. 1.82 B.M.

B. 5.46 B.M.

C. 2.82 B.M.

D. 1.41 B.M.

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341. Choose the correct option out of the following- Which alloy is made up of 95% Cu, 4% Sn, 1% P?

A. Brass

B. Bronze

C. Gun metal

D. Coin metal

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342. Which one of the following complex ions has geometrical isomers ?

A. $\left[Ni\left(NH_3\right)_5Br\right]^+$

B. $\left[Co(en)_2\left(NH_3\right)_2\right]^{3+}$

C. $\left[Cr\left(NH_3\right)_4(en)\right]^{3+}$

D. $\left[Co(en)_3\right]^{3+}$

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343. Which among the following will be named as dibromidobis(ethylene diamine) chromium (III) bromide?

A. $\left[Cr(en)_2Br_2\right]Br$

B. $\left[Cr(en)Br_4\right]^-$

C. $\left[Cr(en)Br_2\right]Br$

D. $\left[Cr(en)_3\right]Br_3$

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344. The octahedral complex of a metal ion M^{3+} with four monodentate ligands L_1, L_2, L_3 and L_4 absorbs wavelengths in the region of red, green, yellow and blue, respectively. The increasing order of ligand strength of the four ligands is

A. $L_1 < L_2 < L_4 < L_3$

B. $L_4 < L_3 < L_2 < L_1$

C. $L_1 < L_3 < L_2 < L_4$

D. $L_3 < L_2 < L_4 < L_1$

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345. Predict the number of unpaired electrons in the square planar $\left[Pt(CN)_4\right]^{2-}$ ion.

A. 4

B. 6

C. 2

D. 3

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346. The pair having the same magnetic moment is (At No. Cr = 24, Mn = 25, Fe = 26, Co=27)

A. $\left[Cr\left(H_2O\right)_6\right]^{2+}$ and $\left[CoCl_4\right]^{2-}$

B. $\left[Cr\left(H_2O\right)_6\right]^{2+}$ and $\left[Fe\left(H_2O\right)_6\right]^{2+}$

C. $\left[Mn\left(H_2O\right)_6\right]^{2+}$ and $\left[Cr\left(H_2O\right)_6\right]^{2+}$

D. $\left[CoCl_4\right]^{2-}$ and $\left[Fe\left(H_2O\right)_6\right]^{2+}$

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347. Which one of the following complexes shows optical isomerism?

A. $\left[Co\left(NH_3\right)_3Cl_3\right]$

B. *cis* - $\left[Co(en)_2Cl_2\right]Cl$

C. *trans* - $\left[Co(en)_2Cl_2\right]Cl$

D. $\left[Co\left(NH_3\right)_4Cl_2\right]Cl$ (en = ethylenediamine)

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348. Discuss the nature of bonding in metal carbonyls.

A. Only σ character

B. Only π character

C. Both σ and π character

D. Only δ character

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349. Choose the correct option- Brass has the following composition-

A. Cu and Zn

B. Ni and Cr

C. Fe and Sn

D. Fe and Mg

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350. Write the iupac name of the following : $\left[Ag\left(NH_3\right)_2\right]Cl$

A.

B.

C.

D.

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351. When 0.01 mole of a cobalt complex is treated with excess silver nitrate solution, 4.305 g silver chloride is precipitated. The formula of the complex is

A. $\left[Co\left(NH_3\right)_3Cl_3\right]$

B. $\left[Co\left(NH_3\right)_5Cl\right]Cl_2$

C. $\left[Co\left(NH_3\right)_6\right]Cl_3$

D. $\left[Co\left(NH_3\right)_4Cl_2\right]NO_3$

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352. In the brown ring complex $\left[Fe\left(H_2O\right)_5(NO)\right]SO_4$, nitric oxide behaves as

A. NO^+

B. neutral NO molecule

C. NO^-

D. NO^{2-}

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353. The atomic number of cobalt is 27. The EAN of cobalt in $Na_3\left[Co\left(NO_2\right)_4Cl_2\right]$ is

A. 35

B. 24

C. 36

D. 34

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354. Amongst $\left[NiCl_4\right]^{2-}$, $\left[Ni\left(H_2O\right)_6\right]^{2+}$, $\left[Ni\left(PPh_3\right)_2Cl_2\right]$, $\left[Ni(CO)_4\right]$ and $\left[Ni(CN)_4\right]^{2-}$, the paramagnetic species are

A. $[NiCl_4]^{2-}, [Ni(H_2O)_6]^{2+}, [Ni(PPh_3)_2Cl_2]$

B. $[Ni(CO)_4], [Ni(PPh_3)_2Cl_2], [NiCl_4]^{2-}$

C. $[Ni(CN)_4]^{2-}, [Ni(H_2O)_6]^{2+}, [NiCl_4]^{2-}$

D. $[Ni(PPh_3)_2Cl_2], [Ni(CO)_4], [NiCl_4]^{2-}$

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355. Amongst the following ions which one has the highest magnetic moment value: $[Fe(H_2O)_6]^{2+}$

A. $[Co(NH_3)_6]^{3+}$

B. $[Cr(H_2O)_6]^{3+}$

C. $[Cr(CN)_6]^{3-}$

D. $[CoCl_6]^{3-}$

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356. Which one among the following is a homoleptic complex ?

A. Tris (ethane-1,2-diamine) cobalt (III) chloride

B. Triamminetriaquachromium (III) chloride

C. Diamminechloridonitrito- N-platinum (II)

D. Dichloridobis (ethane-1,2-diamine) cohalt(III) chloride

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357. Write IUPAC name of the complex: $\left[CoCl_2(en)_2\right]^+$.

A. 4,3 and 6

B. 6,2 and 6

C. 6,6 and 3

D. 6, 3 and 6

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358. The correct IUPAC name of $\left[Co\left(NH_3\right)_3\left(NO_2\right)_3\right]$ is

A. Triamminetrinitrito-N-cobalt (III)

B. Triamminetrinitrito-N-cobalt (II)

C. Triamminecobalt (III) nitrite

D. Triamminetrinitrito-N-cobaltate (III)

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359. $\left[Cr\left(NH_3\right)_6\right]\left[Cr(SCN)_6\right]$ and $\left[Cr\left(NH_3\right)_2(SCN)_4\right]\left[Cr\left(NH_3\right)_4(SCN)_2\right]$ are the examples of what type of isomerism ?

A. Ionisation isomerism

B. Linkage isomerism

C. Coordination isomerism

D. Solvate isomerism

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360. the catalyst used in the hydrogenation of oils is :

A. $Co(CO)_8$

B. $\left(Ph_3P\right)_3RhCl$

C. $\left[Pt\left(NH_3\right)_2Cl_2\right]$

D. $K\left[Ag(CN)_2\right]$.

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361. Consider the following two complex ions: $\left[CoF_6\right]^{3-}$ and $\left[Co\left(C_2O_4\right)_3\right]^{3-}$. Which of the following statement(s) is/are false? I. Both are octahedral. II. $\left[Co\left(C_2O_4\right)_3\right]^{3-}$ is diamagnetic while $\left[CoF_6\right]^{3-}$ is paramagnetic. III. Both are outer orbital complexes. IV. Inboth the complexes the central metal is in the same oxidation state.

A. I and III

B. II, III and IV

C. III only

D. III and IV

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362. Chlorophyll is a coordination compound of

A. iron

B. magnesium

C. manganese

D. chromium

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363. Write IUPAC name of the complex: $\left[CoCl_2(en)_2\right]^+$.

A. two

B. three

C. no isomer

D. four isomers.

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364. CO is a stronger ligand than Cl^- , because

A. CO is a neutral molecule

B. CO has π-bonds

C. CO is poisonous

D. CO is more reactive.

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365. Which of the following statement is correct?

A. $SCN^- < F^- < CN^- < CO$

B. $F^- < SCN^- < CN^- < CO$

C. $CN^- < F^- < CO < SCN^-$

D. $SCN^- < CO < F^- < CN^-$

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366. As per IUPAC norms, the name of the complex $\left[Co(en)_2(ONO)Cl\right]Cl$ is

A. Chloridobis (ethane-1,2-diamine)nitrito-O-cobalt (III) chloride.

B. Chlorobis(ethylenediamine)nitro-O-cobalt (III) chloride.

C. Chloridodi(ethylene diamine)nitrocobalt (III) chloride.

D. Chloroethylenediaminenitro-O-cobalt (III) chloride.

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367. What kind of isomerism is exhibited by octahedral $Co\left(NH_3\right)_4Br_2Cl$?

A. Geometrical and ionization

B. Geometrical and optical

C. Optical and ionization

D. Geometrical only

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368. Among the following metal carbonyls, the C-O bond order is lowest in

A. $\left[Mn(CO)_6\right]^+$

B. $\left[Fe(CO)_5\right]$

C. $\left[Cr(CO)_6\right]$

D. $\left[V(CO)_6\right]^-$

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369. Both $\left[Ni(CO)_4\right]$ and $\left[Ni(CN)_4\right]^{2-}$ are diamagnetic. The hybridisations of nickel in these complexes respectively are

A. sp^3, sp^3

B. sp^3, dsp^2

C. dsp^2, sp^3

D. dsp^2, dsp^2

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370. The ionization isomer of $\left[Cr\left(H_2O\right)_4\left(NO_2\right)\right]Cl_2$ is :

A. $\left[Cr\left(H_2O\right)_4\left(O_2N\right)\right]Cl_2$

B. $\left[Cr\left(H_2O\right)_4Cl_2\right]NO_2$

C. $\left[Cr\left(H_2O\right)_4Cl(ONO)\right]Cl$

D. $\left[Cr\left(H_2O\right)_3Cl_2\left(NO_2\right)\right]H_2O$

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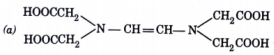
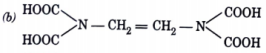
371. The correct structure of ethylenediamine tetraacetic acid (EDTA) is :

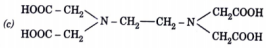
A.



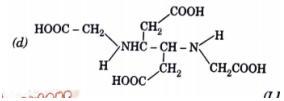
B.



C.



D.



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372. The complex showing a spin only magnetic moment of 2.82 B.M. is

A. $Ni(CO)_4$

B. $\left[NiCl_4\right]^{2-}$

C. $Ni\left(PPh_3\right)_4$

D. $\left[Ni(CN)_4\right]^{2-}$

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373. Gometrical shapes of the complexes formed by the reaction of Ni^{2+} with Cl^-, CN^- and H_2O respectively, are

A. octahedral, tetrahedral and square planar

B. tetrahedral, square planar and octahedral

C. square planar, tetrahedral and octahedral

D. octahedral, square planar and octahedral.

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374. Among the following complexes $(K - P)$, $K_3\left[Fe(CN)_6\right](K)$, $\left[Co\left(NH_3\right)_6\right]Cl_3(L), Na_3\left[Co(\otimes alate)_3\right](M)$, $\left[Ni\left(H_2O_6\right)Cl_2(N), K_2\left[Pt(CN)_4\right](O)\right.$ and $\left.\left[Zn\left(H_2O_6\right)\right]\left(NO_3\right)_2(P)\right.$ the diamagnetic complexes are

A. K,L,M,N

B. K,M,O,P

C. L,M, O, P

D. L,M,N,O

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375. $NiCl_2\left[P\left(C_2H_5\right)_2\left(C_6H_5\right)\right]_2$ exhibits temperature dependent magnetic behaviour (paramagnetic/diamagnetic). The coordination geometries of Ni^{2+} in the paramagnetic and diamagnetic states are respectively

A. tetrahedral and tetrahedral

B. square planar and square planar

C. tetrahedral and square planar

D. square planar and tetrahedral

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376. Consider the following complex ions, P, Q and R. $P = \left[FeF_6\right]^{3-}, Q = \left[V\left(H_2O\right)_6\right]^{2+}$ and $R = \left[Fe\left(H_2O\right)_6\right]^{2+}$. The correct order of the complex ions, according to their spin-only magnetic moment values (in B.M.) is

A. RltQltP

B. QltRltP

C. RltPltQ

D. QltPltR

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377. The equation which is balanced and represents the correct product(s) is

A. $CuSO_4 + 4KCN \rightarrow K_2\left[Cu(CN)_4\right] + K_2SO_4$

B. $Li_2O + 2KCl \rightarrow 2LiCl + K_2O$

C. $\left[CoCl\left(NH_3\right)_5\right]^+ + 5H^+ \rightarrow Co^{2+} + 5NH_4^+ + Cl^-$

D. $\left[Mg\left(H_2O\right)_6\right]^{2+} + (EDTA)^{4-} \xrightarrow{excessNaOH} \left[Mg(EDTA)^{2+} + 6H_2O\right]$

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378. Write the iupac name of the following : $\left[Co(CO)_4\right]$

A.

B.

C.

D.

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379. The geometries of the ammonia complexes of Ni^{2+}, Pt^{2+} and Zn^{2+}, respectively, are

A. octahedral, square planar and tetrahedral

B. square planar, octahedral and tetrahedral

C. tetrahedral, square planar and octahedral

D. octahedral, tetrahedral and square planar

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380. Which of the following ligands can act as ambidentate ligand ?

A. oxalate ion

B. CN^-

C. en

D. NO_2^-

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381. The isomerism shown by the complex $\left[CoCl_2(OH)_2\left(NH_3\right)_2\right]$ Br are

A. Ionization

B. Geometrical

C. Linkage

D. Optical

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382. In which of the following names are not correct for the complexes :

A. $\left[CoCl\left(NH_3\right)_5\right]CO_3$ Chloropentaammine cobalt (III) carbonate

B. $K_2\left[Zn(OH)_4\right]$ Potassium tetrahydroxozincate (II)

C. $\left[Pt(py)_4\right]\left[PtCl_4\right]$ Tetrapyridineplatinum (II) tetrachloroplatinate (II)

D. $K_4\left[Ni(CN)_4\right]$ Potassium tetracyanonickel (0)

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383. Which of the following are square planar complexes ?

A. $\left[Pt\left(CN_4\right)\right]^{2-}$

B. $\left[NiCl_4\right]^{2-}$

C. $\left[Zn\left(NH_3\right)_4\right]^{2+}$

D. $\left[Cu\left(NH_3\right)_4\right]^{2-}$

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384. Which of the following are outer orbital complexes ?

A. $\left[Fe\left(H_2O\right)_6\right]^{3+}$

B. $\left[CoF_6\right]^{3-}$

C. $\left[Fe(CN)_6\right]^{4-}$

D. $\left[Fe(CN)_6\right]^{3-}$

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385. Magnelium has the following composition-

A. Al and Mg

B. Al, Mg and Cu

C. Cu and Zn

D. Fe and Zn

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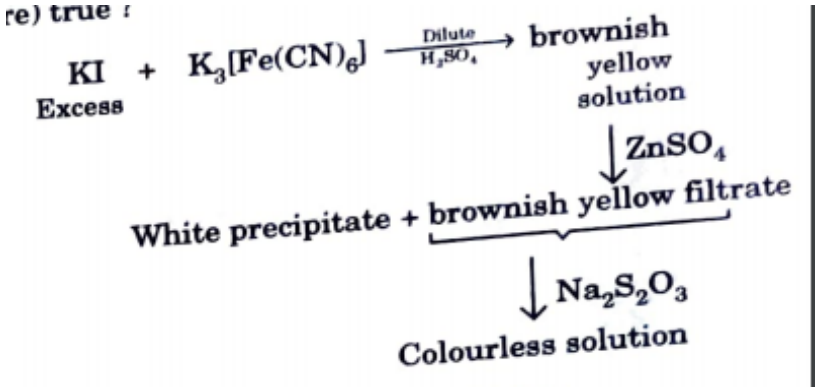
386. For the given aqueous reactions, which of the statement(s) is (are) true ?



A. The first reaction is a redox reaction.

B. White precipitate is $Zn_3\left[Fe(CN)_6\right]_2$.

C. Addition of filtrate to starch solution gives blue colour.

D. White precipitate is soluble in NaOH solution.

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387. In basic medium the amount of Ni^{2+} in a solution can be estimated with the dimethylglyoxime reagent. The correct statement(s) about the reaction and the product is (are)

A. in ammoniacal solution, Ni^{2+} salts give cherry-reaction precipitate of nickel (II) dimethylglyoximate

B. two dimethylglyoximate units are bound to one Ni^{2+}.

C. in the complex two dimethylglyoximate units are hydrogen bonded to each other

D. each dimethylglyoximate unit forms a six-membered chelate ring with Ni^{2+}.

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388. Chlorophyll is a coordination compound of

A. $\left[Cr\left(NH_3\right)_5Cl\right]Cl_2$ and $\left[Cr\left(NH_3\right)_4Cl_2\right]Cl$

B. $\left[Co\left(NH_3\right)_4Cl_2\right]^+$ and $\left[Pt\left(NH_3\right)_2\left(H_2O\right)Cl\right]^+$

C. $\left[CoBr_2Cl_2\right]^{2-}$ and $\left[PtBr_2Cl_2\right]^{2-}$

D. $\left[Pt\left(NH_3\right)_3\left(NO_3\right)\right]Cl$ and $\left[Pt\left(NH_3\right)_3Cl\right]Br$

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389. Double fertilization is exhibited by

A. *cis* - $\left[CrCl_2(\otimes)_2\right]^{3-}$

B. $\left[Co(en)_3\right]^{3+}$

C. *trans* - $\left[CrCl_2(\otimes)_2\right]^{3-}$

D. $\left[Co(\otimes)(en)_2\right]^{+}$

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390. $Ni^{2+} \xrightarrow{KCN}$ Complex 1 $Ni^{2+} \xrightarrow{excess\ KCI}$ Complex 2 Both the above complexes have coordination number 4. Answer the following (1-3) questions : The IUPAC names for the complexes are respectively

A. Potassium tetracyanonickelate (II) and potassium tetrachloronickelate (II)

B. Potassium tetracyanonickel (II) and potassium tetrachloronickel (II)

C. Potassium tetracyanonickel and potassium chloronied.

D. Potassium tetracyanonickelate (II) and potassium tetrachloronickel (II)

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391. What is correct regarding leucocytes?

A. Both are diamagnetic

B. Both are paramagnetic

C. The cyano complex is diamagnetic and the chloro complex is paramagnetic.

D. The cyano complex is paramagnetic and the chloro complex is diamagnetic.

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392. Both $\left[Ni(CO)_4\right]$ and $\left[Ni(CN)_4\right]^{2-}$ are diamagnetic. The hybridisations of nickel in these complexes respectively are

A. dsp^2 in both

B. sp^3 in both

C. dsp^3 in cyano and sp^3 in chloro complex

D. sp^3 in cyano complex and dsp^3 in chloro complex.

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393. A metal complex having the molecular formula $Cr\left(NH_3\right)_4Cl_2$,Br have been isolated in two forms (A) and (B). The form (A) reacts with $AgNO_3$ giving white precipitate readily soluble in dilute NH_4OH while (B) gives a yellow precipitate soluble in concentrated NH_4OH. Answer the following questions : The formula of complex A is

A. $\left[Cr\left(NH_3\right)_4Br\right]Cl_2$

B. $\left[Cr\left(NH_3\right)_4ClBr\right]Cl$

C. $\left[Cr\left(NH_3\right)_4Cl_2\right]Br$

D. $\left[Cr\left(NH_3\right)_5Cl\right]BrCl$

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394. Both $\left[Ni(CO)_4\right]$ and $\left[Ni(CN)_4\right]^{2-}$ are diamagnetic. The hybridisations of nickel in these complexes respectively are

A. d^2sp^3 and sp^3d^2

B. sp^3d^2 and sp^3d^2

C. $sp^3d^2$and d^2sp^3

D. d^2sp^3 and d^2sp^3

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395. Choose the correct option- Artificial gold has the following composition-

A. Cu and Zn

B. Al and Mg

C. Cu and Al

D. Ni and Zn

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396. Choose the correct option- Coin metal has the following composition-

A. Al and Mg

B. Mg and Cu

C. Cu, Sn, Zn

D. Cu, Sn, P

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397. Choose the correct option- Gun metal has the following composition-

A. Cu and Ni

B. Zn, Cu, Sn

C. Al and Ni

D. None of the above.

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398. The magnetic moment is a

A. [A]

B. [B]

C. [C]

D. [D]

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399. Which of the following does not exist? $XeOF_4, NeF_2, XeF_2, XeF_6$.

A. (A): $t_{2g}^4 e_g^2$

B. (B):t_{2g}^6

C. (C):$t_{2g}^4 e_g^1$

D. (D):t_{2g}^5

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400. The magnetic moment is a

A. $2\sqrt{6}, 0, \sqrt{35}, \sqrt{3}$

B. $0, 2\sqrt{6}, \sqrt{35}, \sqrt{3}$

C. $\sqrt{35}, 2\sqrt{6}, \sqrt{3}, 0$

D. $\sqrt{3}, \sqrt{8}, 0, \sqrt{15}$

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401. Find a relation between x and y if the points (x,y), (1,2) and (7, 0) are collinear.

A. bis (ethylenediamine) dinitrocobalt (II) chloride

B. bis (theylenediamine) dinitrocobalt (II) chloride

C. dinitro bis (ethylenediamine) cobalt (III) chloride

D. bis (ethylene diammine) dinitro cobalt (III) chloride

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402. Number of possible isomers for the complex $\left[Co(en)_2Cl_2\right]Cl$ will be : (en = ethylenediamine)

A. 4

B. 6

C. 3

D. 8

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403. Number of possible isomers for the complex $\left[Co(en)_2Cl_2\right]Cl$ will be : (en = ethylenediamine)

A. geometrical and optical

B. ionisation and geometrical

C. ionisation, geometrical and optical

D. ionisation only

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404. Constantin has the following composition-

A. Cu and Mg

B. Cu and Fe

C. Cu and Sn

D. Cu and Ni

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405. Grignard's Reagent is

A. $K_4\left[Fe(CN)_6\right]$

B. Na_2HPO_4

C. K_2CrO_4

D. KOH

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406. The questions given below consist of an Assertion and Reason. Assertion : The complex $\left[Co\left(NH_3\right)_3Cl_3\right]$ does not give precipitate with silver nitrate solution. Reason : The given complex is non-ionizable.

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407. Assertion : The complex ion trans-$\left[Co(en)_2Cl_2\right]^+$ is optically active. Reason: It is an octahedral complex.

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408. Assertion : NF_3 is weaker ligand than $N\left(CH_3\right)_3\Big)$. Reason : NF_3 ionises to give F^- ions in aqueous solution.

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409. Assertion : The $\left[Ni(en)_3\right]Cl_2$ (en = ethylenediamine) has lower stability than $\left[Ni\left(NH_3\right)_6\right]Cl_2$. Reason : In $\left[Ni(en)_3\right]Cl_2$ the geometry of Ni is trigonal bipyramidal.

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410. The number of unpaired electrons in Ni^{3+}. is

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411. The questions given below consist of an assertion and the reason. Use the following key to choose the appropriate answer. (a) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion. (b) The Assertion and the Reason are correct but the Reason is not the correct explanation of the Assertion.(c) Assertion is is CORRECT but reason is INCORRECT. (d) If assertion is INCORRECT but reason is CORRECT. (e)If both assertion and reason are INCORRECT.

Assertion: ZnS is a tetrahedral arrangement.

Reason:In ZnS, S^{2-} ions form cubic close packed structure.

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412. An element has the electronic configuration 2,8,2. It is present in group:

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413. The oxidation state of P in $\left(H_3PO_2\right)$ is

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414. The Allotropy character is not shown by :

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415. Is geometrical isomerism possible around triple bond ?

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416. Explain, Why $\left[Ni(CO)_4\right]$ is diamagnetic whereas $\left[NiCl_4\right]^{2-}$ is paramagnetic ?

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417. The questions given below consist of an Assertion and Reason. Assertion : The complex $\left[Co\left(NH_3\right)_3Cl_3\right]$ does not give precipitate with silver nitrate solution. Reason : The given complex is non-ionizable.

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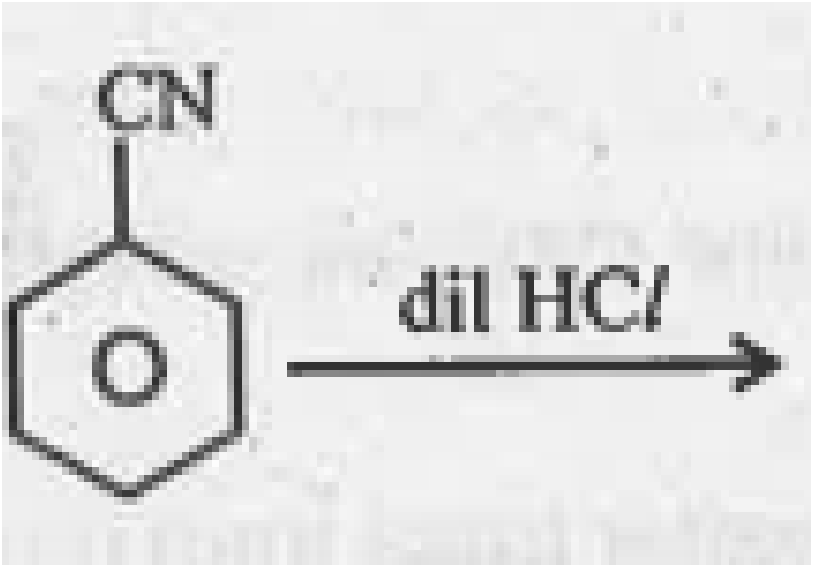
418. Complete the reaction



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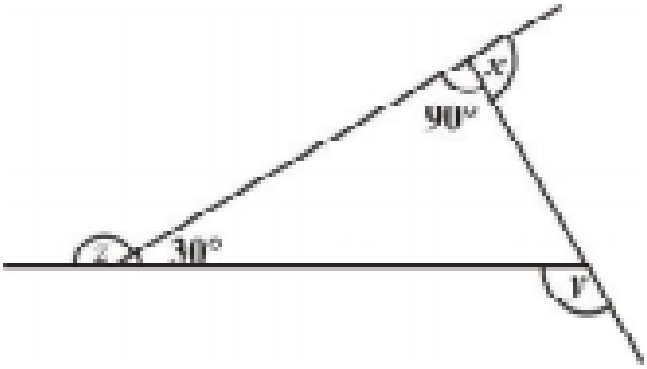
419. Find x+y+z



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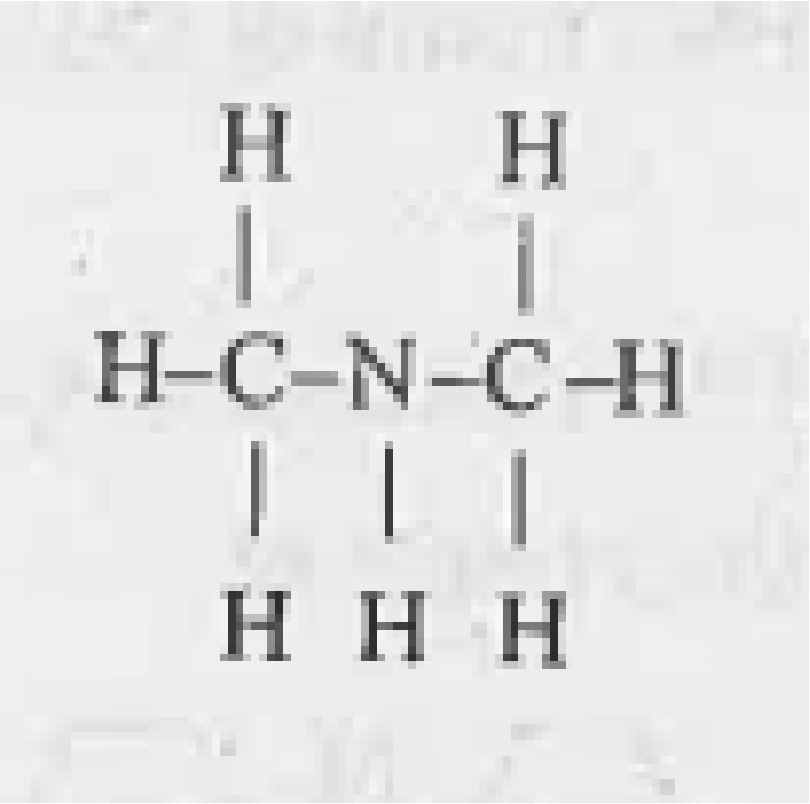
420. Write the IUPAC name of :



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421. Fill in the blanks:

$CH_3—CH_2—\underset{\underset{OH}{|}}{CH}—CH_3$ represent ..... .

A.

	P	Q	R	S
(a)	4	2	3	1

B.

(b)	3	1	4	2

C.

(c)	2	1	3	4

D.

(d)	1	3	4	2

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422. The answer to each of the following question is a single- digit-integer ranging from 0 to 9. Darken the correct digit. The number

ofions per mole of the complex $\left[PtCl\left(NH_3\right)_5\right]Cl_3$ is

0	1	2	3	4	5	6	7	8	9

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423. The coordination number of metal M in the complex $\left[M(en)\left(C_2O_4\right)_2ClBr\right]^-$ is

0	1	2	3	4	5	6	7	8	9

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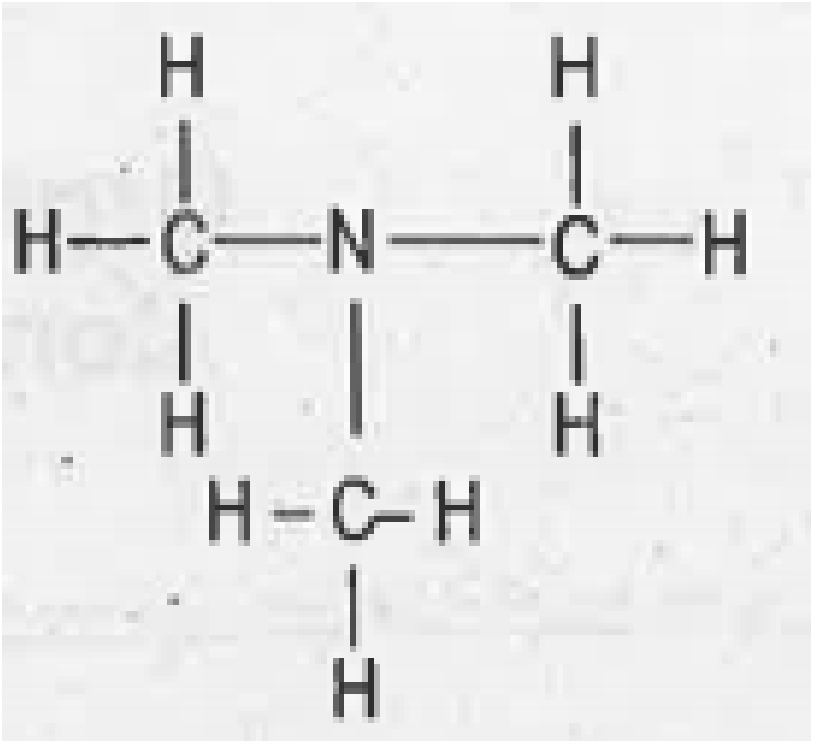
424. Write the IUPAC name of :



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425. In $\left[Fe\left(H_2O\right)_6\right]^{3+}$, the magnetic moment corresponds to number of unpaired electrons equal to

0	1	2	3	4	5	6	7	8	9

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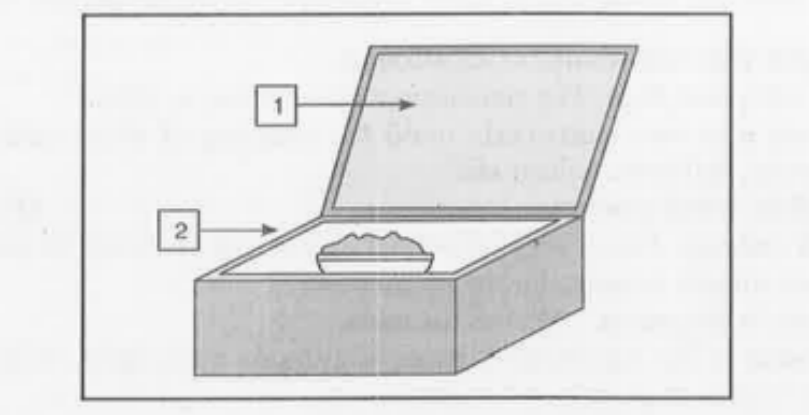
426. Label 1 and 2 in the given figure.



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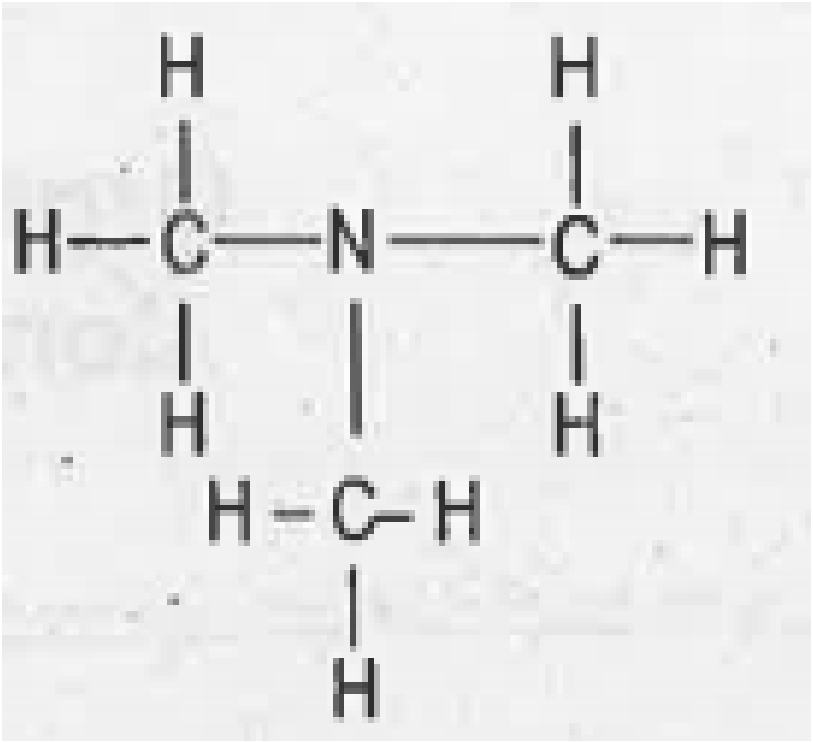
427. Write the IUPAC name of :



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428. Fill in the blanks:

$CH_3—CH_2—\underset{\displaystyle OH}{\underset{|}{CH}}—CH_3$ represent ..... .

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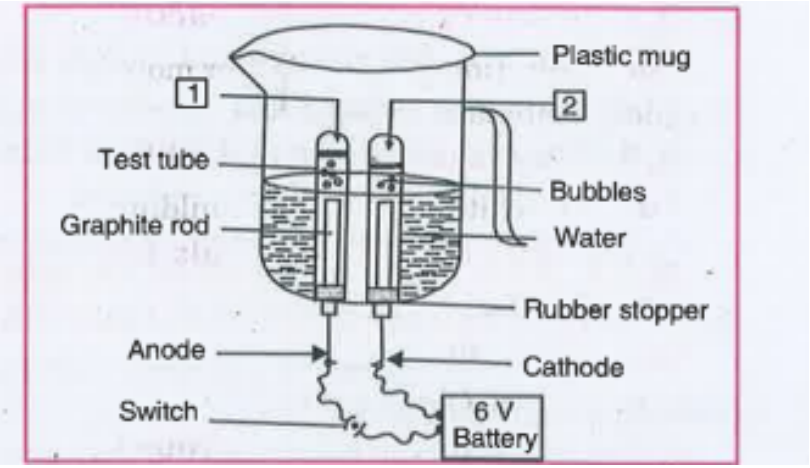
429. What is shown in the figure given a head? Also indicate1 and 2 in the figure



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430. Write the iupac name of the following : $\left[Ni\left(NH_3\right)_4\right]^{+2}$

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431. Which of the following complexes formed by Cu^{2+} ions is most stable ?

A. $Cu^{2+} + 4NH_3 \leftrightarrow \left[Cu\left(NH_3\right)_4\right]^{2+}$, log K =11.6

B. $Cu^{2+} + 4CN^- \leftrightarrow \left[Cu(CN)_4\right]^{2-}$, log K =27.3

C. $Cu^{2+} + 2en \leftrightarrow \left[Cu(en)_2\right]^{2+}$, log K =15.4

D. $Cu^{2+} + 4H_2O \leftrightarrow \left[Cu\left(H_2O\right)_4\right]^{2+}$, log K = 8.9

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432. What type of isomerism is shown by the following complex , $\left[Co\left(NH_3\right)_6\right]\left[Cr(CN)_6\right]$?

A. $\left[Co(CN)_6\right]^{3-} > \left[Co\left(NH_3\right)_6\right]^{3+} > \left[Co\left(H_2O\right)_6\right]^{3+}$

B. $\left[Co\left(NH_3\right)_6\right]^{3+} > \left[Co\left(H_2O\right)_6\right]^{3+} > \left[Co(CN)_6\right]^{3-}$

C. $Co\left(H_2O\right)_6]^{3+} > \left[Co\left(NH_3\right)_6\right]^{3+} > \left[Co(CN)_6\right]^{3-}$

D. $\left[Co(CN)_6\right]^{3-} > \left[Co\left(NH_3\right)_6\right]^{3+} > Co\left(H_2O\right)_6]^{3+}$

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433. When a coordination compound $CrCl_3.6H_2O$ is mixed wih $AgNO_3$, 2 moles of AgCl are precipitated per mole of the compound. Write Structural formula of the complex.

A. 1:3 electrolyte

B. 1:2 electrolyte

C. 1:1 electrolyte

D. 3:1 electrolyte

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434. When a coordination compound $CrCl_3.6H_2O$ is mixed wih $AgNO_3$, 2 moles of AgCl are precipitated per mole of the compound. Write Structural formula of the complex.

A. $CrCl_3\left(H_2O\right)_3\Big].3H_2O$

B. $CrCl_2\left(H_2O\right)_4\Big]Cl.2H_2O$

C. $CrCl\left(H_2O\right)_5\Big]Cl_2.H_2O$

D. $Cr\left(H_2O\right)_6\Big]Cl_3$

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435. The correct IUPAC name of $\left[Pt\left(NH_3\right)_2Cl_2\right]$ is

A. Diamminedichloridoplatinum (II)

B. Diamminedichloridoplatinum (IV)

C. Diamminedichloridoplatinum (0)

D. Dichloridodiammineplatinum (IV)

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436. Which of the following is most acidic?

A. [Fe(CO)]

B. $\left[Fe(CN)_6\right]^{3-}$

C. $\left[Fe\left(C_2O_4\right)_3\right]^{3-}$

D. $\left[Fe\left(H_2O\right)_6\right]^{3+}$

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437. Which type of complexes do not show geometrical isomerism ?

A. $\left[Cr\left(H_2O\right)_4Cl_2\right]^+$

B. $\left[Pt\left(NH_3\right)_3Cl\right]$

C. $\left[Co\left(NH_3\right)_6\right]^{3+}$

D. $\left[Co(CN)_5(NC)\right]^{3-}$

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438. The value of $\left(\frac{1}{2}\right)^{-5}$ will be :

A. $18,000cm^{-1}$

B. $16,000cm^{-1}$

C. $8,000cm^{-1}$

D. $20,000cm^{-1}$

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439. Draw the geometrical isomers of the following complex : $\left[Fe\left(NH_3\right)_2(CN)_4\right]^-$

A. linkage isomers

B. coordination isomers

C. ionisation isomers

D. geometrical isomers

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440. $\left[Co\left(NH_3\right)_5Br\right]SO_4$ and $\left[Co\left(NH_3\right)_5SO_4\right]Br$ areexamples of which type of isomers ?

A. linkage isomerism

B. ionisation isomerism

C. coordination isomerism

D. no isomerism

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441. A chelating agent has two or more than two donor atoms to bind to a single metal ion. Which of the following is not a chelating agent?

A. thiosulphato

B. oxalato

C. glycinato

D. ethane-1,2-diamine

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442. Which of the following ligands is expected to be bidentate?

A. NO

B. NH_4^+

C. $NH_2CH_2CH_2NH$

D. CO

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443. Namethe type of isomerism exhibited bythe following pair of isomers. $\left[Cr\left(H_2O\right)_6\right]Cl_3$ and $\left[Cr\left(H_2O\right)_5Cl\right]Cl_2.H_2O$

A. linkage isomerism

B. solvate isomerism

C. ionisation isomerism

D. coordination isomerism

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444. The correct IUPAC name of $\left[Pt\left(NH_3\right)_2Cl_2\right]$ is:

A. Platinum diaminechloronitrite

B. Chloronitrito-N-ammineplatinum (II)

C. Diamminechloridonitrito-N-platinum (II)

D. Diamminechloronitrito-N-platinate (II)

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445. Which of the following is/are correct?

A. $\left[Co\left(NH_3\right)_6\right]^{3+}$

B. $\left[Mn(CN)_6\right]^{3-}$

C. $\left[Fe(CN)_6\right]^{4-}$

D. $\left[Fe(CN)_6\right]^{3-}$

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446. Which of the following are outer orbital complexes ?

A. $\left[MnCl_6\right]^{3-}$

B. $\left[FeF_6\right]^{3-}$

C. $\left[CoF_6\right]^{3-}$

D. $\left[Ni\left(NH_3\right)_6\right]^{2+}$

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447. Which of the following options are correct?

A. d^2sp^3 hybridisation

B. sp^3d^2 hybridisation

C. paramagnetic

D. diamagnetic

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448. Aqueous solution of sodium chloride turns

A. $\left[Co\left(H_2O\right)_6\right]^{2+}$ is transformed into $\left[CoCl_6\right]^{4-}$

B. $\left[Co\left(H_2O\right)_6\right]^{2+}$ is transformed into $\left[CoCl_6\right]^{2-}$

C. tetrahedral complexes have smaller crystal field splitting than octahedral complexes.

D. tetrahedral complexes have larger crystal field splitting than octahedral complex.

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449. Which one of the following complexes shows optical isomerism?

A. $\left[Co\left(NH_3\right)_6\right]^{3+}$

B. $\left[Co\left(NH_3\right)_4Cl_2\right]^{+}$

C. $\left[Ni(CN)_4\right]^{2-}$

D. $\left[Ni\left(NH_3\right)_4Cl_2\right]$

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450. Which of the following polymers are thermoplastic?

A. $\left[Cr\left(NH_3\right)_6\right]^{3+}$

B. $\left[Fe\left(NH_3\right)_4Cl_2\right]^{+}$

C. $\left[Mn(CN)_6\right]^{4-}$

D. $\left[Co\left(NH_3\right)_4Cl_2\right]$

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451. What are optically active compounds ?

A. $\left[Co(en)_3\right]^{3+}$

B. *trans* - $\left[Co(en)_2Cl_2\right]^{+}$

C. *cis* - $\left[Co(en)_2Cl_2\right]^{+}$

D. $\left[Cr\left(NH_3\right)_5Cl\right]$

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452. Identify the correct statement on inhibin

A. It is a neutral ligand.

B. It is a didentate ligand.

C. It is a chelating ligand.

D. It is a unidentate ligand.

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453. Which one of the following complexes shows optical isomerism?

A. $\left[Co\left(NH_3\right)_5\left(NO_2\right)\right]^{2+}$

B. $\left[Co\left(H_2O\right)_5CO\right]^{3+}$

C. $\left[Cr\left(NH_3\right)_5SCN\right]^{2+}$

D. $\left[Fe(en)_2Cl_2\right]^{+}$

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454. Monel metal has the following composition-

A. Ni, Cu, Fe, Mn, C, Si

B. Cu and Mg

C. Mg, Fe, Ni, Co

D. Mn and Fe

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455. Match the coordination compounds given in Column I with the central metal atoms given in Column II and assign the correct code :

Column I (Coordination Compound)	Column II (Central metal atom)
A. Chlorophyll	1. rhodium
B. Blood pigment	2. cobalt
C. Wilkinson catalyst	3. calcium
D. Vitamin B_{12}	4. iron
	5. magnesium

A.

(a) A (5) B (4) C (1) D (2)

B.

(b) A (3) B (4) C (5) D (1)

C.

(c) A (4) B (3) C (2) D (1)

D.

(d) A (3) B (4) C (1) D (2)

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456. Match the complex ions given in Column I with the hybridisation and number of unpaired electrons given in Column II and assign the correct code :

Column I (Complex ion)	Column II (Hybridisation, number of unpaired electrons)
A. $[Cr(H_2O)_6]^{3+}$	1. dsp^2, 1
B. $[Co(CN)_4]^{2-}$	2. sp^3d^2, 5
C. $[Ni(NH_3)_6]^{2+}$	3. d^2sp^3, 3
D. $[MnF_6]^{4-}$	4. sp^3, 4
	5. sp^3d^2, 2

A. A(3) B (1) C (5) D (2)

B. A(4) B(3) C(2) D (1)

C. A(3) B (2) C (4) D(1)

D. A(4) B (1) C (2) D (3)

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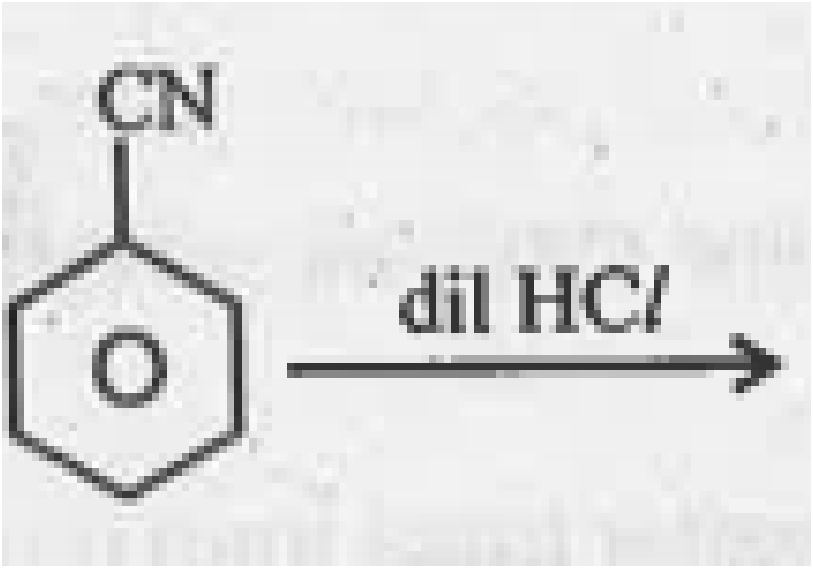
457. Complete the reaction



A. A(1) B (2) C (4) D (5)

B. A (4) B (3) C (2) D (1)

C. A(4) B (1) C (5) D (3)

D. A(4) B (1) C (2) D (3)

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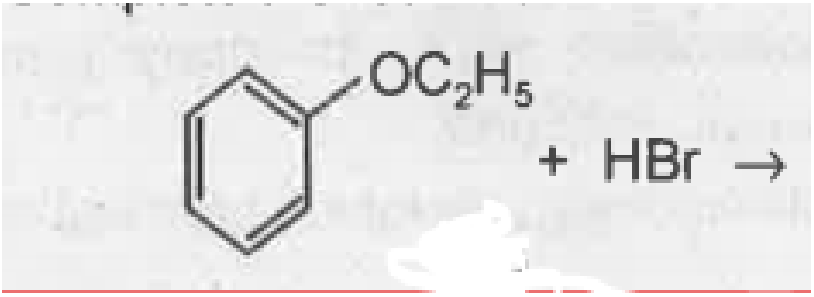
458. Complete the reaction :



A. A(1) B (2) C (4) D (5)

B. A(4) B(3) C(2) D (1)

C. A (5) B(1) C (4) D (2)

D. A(4) B(1) C (2) D (3)

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459. In the following questions a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices. (a) Both assertion and reason are true and reason is the correct explanation of assertion. (b) Both assertion and reason are true but reason is not the correct explanation of assertion. (c) Assertion is true but reason is false. (d) Assertion is false but reason is true. (e) Assertion and reason both are wrong. Assertion : Nickel can be purified by Mond process. Reason: $Ni(CO)_4$ is a volatile compound which decomposes at 460 K to give pure Ni.

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460. How many unpaired electrons are present in Gd(Z = 64) ?

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461. Why is geometrical isomerism not possible in tetrahedral compounds having two different types of unidentate ligands with the central metal ion ?

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462. Which type of complexes do not show geometrical isomerism ?

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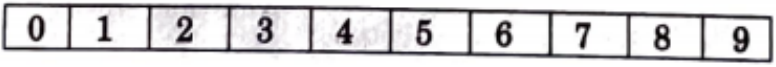
463. In $\left[Fe\left(H_2O\right)_6\right]^{3+}$, the magnetic moment corresponds to number of unpaired electrons equal to



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464. Give one example of linkage isomer.

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465. Why does NH_3 readily form complexes but NH_4^+ does not ?

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466. Give evidence that [CO(NH3)5Cl]S04 and [CO(NH3)5(S04)]Cl are ionisation isomers.

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467. Name central metal atom present in haemoglobin and Vitamin B_{12}.

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468. Name one example of a hexadentate ligand.

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469. Write the IUPAC name of the following :

$K_3\left[Fe(CN)_5NO\right]$

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470. Write IUPAC name of the following : $\left[Cr\left(NH_3\right)_3Cl_3\right]$

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471. Draw the structures of optical isomers of: $\left[Cr\left(C_2O_4\right)_3\right]^3$ -

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472. Draw the structures of optical isomers of: $\left[Cr\left(C_2O_4\right)_3\right]^3$ -

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473. The hexaquo manganese(II) ion contains five unpaired electrons, while the hexacyanoion contains only one unpaired electron. Explain using Crystal Field Theory.

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474. What is meant by stability of a coordination compound in solution? State the factors which govern

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475. Discuss the main postulates of Werner's coordination theory.

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476. Write the shape and magnetic behaviour of the following complex : $\left[Ni(CN)_4\right]^{2-}$

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477. Write the shape and magnetic behaviour of the following complex : $\left[Ni(CN)_4\right]^{2-}$

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478. Write the shape and magnetic behaviour of the following complex : $\left[Co\left(NH_3\right)_6\right]^{3+}$

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479. Explain the following :

Iodine is more soluble in KI solution than in water.

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480. Beta elimination is not possible in

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481. Which of the following are outer orbital complexes ?

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482. Define chelate and chelating ligand. Give one example of chelate complex.

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483. Study of coordination compounds is called Chemistry ?

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484. Discuss the nature of bonding in metal carbonyls.

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485. $\left[Fe(CN)_6\right)]^{4-}$ and $\left[Fe\left(H_2O\right)_6\right)]^{2+}$ are of different colours in dilute solutions. Why ?

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486. What is spectrochemical series?

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487. Draw figure to show the splitting of d orbitals in an octahedral crystal field.

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488. Indicate the number of unpaired electron in

Fe

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489. Indicate the number of unpaired electron in

Fe

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490. What is the coordinate number of the central metal ions in the following coordination compound ?

$\left[PtCl_2(en)_2\right]$

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491. What is the coordinate number of the central metal ions in the following coordination compound ?

$K_4\left[Ni(CN)_4\right]$

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492. What is the coordinate number of the central metal ions in the following coordination compound ?

$[Fe(edta)]^-$

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493. What is the coordinate number of the central metal ions in the following coordination compound ?

$\left[Fe(en)_3\right]Cl_3$

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494. What is the coordinate number of the central metal ions in the following coordination compound ?

$\left[Mo(CN)_8\right]^{4-}$

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495. What is the coordinate number of the central metal ions in the following coordination compound ?

$Fe(CO)_5$

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496. What is the coordinate number of the central metal ions in the following coordination compound ?

$\left[Rh\left\{P\left(C_6H_5\right)\right\}_3\right]Cl$

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497. What is the coordinate number of the central metal ions in the following coordination compound ?

$K_3\left[Fe\left(C_2O_4\right)_3\right]$

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498. What is the oxidation state of iron in the following ?

$\left[Fe(CN)_6\right]^{3-}$

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499. What is the oxidation state of iron in the following ?

$K_4\left[Fe(CN)_6\right]$

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500. What is the oxidation state of iron in the following ?

$Fe(CO)_5$

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501. What is the oxidation state of iron in the following ?

$\left[Fe\left(H_2O\right)_6\right]^{3+}$

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502. Specify the oxidation numbers of the metals in the following coordination entities: $\left[Co\left(H_2O\right)(CN)(en)_2\right]^{2+}$

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503. Specify the oxidation numbers of the metals in the following coordination entities: $\left[Cr\left(NH_3\right)_3Cl_3\right]$

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504. Specify the oxidation numbers of the metals in the following coordination entities: $\left[CoBr_2(en)_2\right]^+$

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505. Specify the oxidation numbers of the metals in the following coordination entities: $\left[PtCl_4\right]^{2-}$

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506. Specify the oxidation numbers of the metals in the following coordination entities: $K_3\left[Fe(CN)_6\right]$

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507. Calculate the oxidation state of the central metal atom in the following : $[Fe(EDTA)]^-$

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508. Calculate the oxidation state of the central metal atom in the following : $\left[Co\left(NO_2\right)_2\left(C_5H_5N\right)_2\left(NH_3\right)_2\right]NO_3$

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509. Calculate the oxidation state of the central metal atom in the following : $K_4\left[Ni(CN)_4\right]$

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510. Calculate the oxidation state of the central metal atom in the following : $Na\left[Co(CO)_4\right]$

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511. Indicate the oxidation state of the central metal in the following complex : $\left[PdI_2(ONO)_2\left(H_2O\right)_2\right]$

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512. Which of the following is expected to be more stable : $\left[Co(en)_3\right]^{3+}$ or $\left[Co\left(NH_3\right)_6\right]^{3+}$?

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513. Write the formulae of the following coordination compound : hexaamminecobalt (III) sulphate.

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514. Write the formulae of the following coordination compound : potassium tetrachloridopalladate (II).

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515. Write the formulae of the following coordination compound : diamminechloridonitrito -N- platinum (II) .

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516. Write the formulae of the following coordination compound : pentaamminenitrito -N- cobalt (III) .

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517. Write the formulae of the following coordination compound : pentaamminenitrito - O- cobalt (III).

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518. Write the formulae of the following coordination compound : tetrabromidocuprate (II).

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519. Write the formulae of the following coordination compound : hexaammineplatinum (IV).

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520. Write the formulas for the following coordination compounds: Potassium tetracyanidonickelate(II)

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521. Write the formulae of the following coordination compound : potassium trioxalatachromate (III) .

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522. Write the formulas for the following coordination compounds: Tetracarbonylnickel(O)

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523. Write IUPAC name of the following

$K_3\left[Al\left(C_2O_4\right)\right]_3$

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524. Write IUPAC name of the following : $\left[Ni(CO)_4\right]$

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525. Write IUPAC name of the following : $Fe_4\left[Fe(CN)_6\right]_3$

Watch Video Solution

526. Write IUPAC name of the following : $\left[CoCl\left(NH_3\right)_5\right]Cl_2$

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527. Write IUPAC Name of Complexe : $\left[PtCl_2\left(C_5H_5N\right)\left(NH_3\right)\right]$

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528. Write IUPAC name of the following : $Na\left[PtBrCl\left(NO_2\right)\left(NH_3\right)\right]$

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529. Write IUPAC name of the following : $\left[Cr\left(NH_3\right)_3Cl_3\right]$

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530. Write IUPAC name of the following : $K_3\left[Fe(CN)_6\right]$

Watch Video Solution

531. Write IUPAC name of the following : $Na_3[AlF_6]$

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532. Fill in the blanks- Gypsum is the commercial name of_____.

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533. Answer the following term in brief- Gypsum.

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534. Is the following name is correct ?

$[Ag(CN)_2]^-$: dicyanosilver (I) ion.

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535. Is the following name is correct ?

$\left[CoCO_3\left(NH_3\right)_5\right]Cl$: pentaamminecarbonatocobalt (III) chloride.

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536. Is the following name is correct ?

$K_3\left[Fe(CN)_5NO\right]$: potassium pentacyanonitroferrate (II).

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537. The gypsum is used in-

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538. Explain the following statement- Gypsum is used as a fluxing agent.

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539. Give the formula of following compound : diamminechlorido(methylamine)platinum(II)chloride

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540. Give the formula of following compound : bis(ethylenediamine)dinitrocobalt(III)chloride

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541. Predict the number of different types of isomers for the following complex : $\left[CoCl_2(en)_2\right]^+$

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542. Choose the correct option from the following and answer the question given- The formula of gypsum is-

A. CuSO4

B. CuSO4.4H2O

C. CuSO4.2H2O

D. none of the above

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543. What type of isomerism is shown by the following complex , $\left[Co\left(NH_3\right)_6\right]\left[Cr(CN)_6\right]$?

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544. Complete the following statement- The chemical formula for Plaster of Paris is-

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545. Give the formula of following compound : diamminechloridonitrito-N-platinum(II)

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546. Give the formula of following compound : potassium dibromidodioxalatochromate(III)

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547. Which of the following exhibit geometrical isomerism ?

A. $\left[CoCl_2(en)_2\right]^+$

B. $\left[PtCl\left(NH_3\right)_3\right]$

C. Tetrahedral $\left[CoBrCl\left(NH_3\right)_2\right]$

D. $\left[RhCl_3\left(NH_3\right)_3\right]$

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548. Write the following : Linkage isomer of $\left[Co\left(NH_3\right)_5ONO\right]Cl_2$

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549. What is the commercial name of calcium sulphate hemihydrate?

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550. Give the formula of following compound : tetrachloridonickelate(II)ion

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551. How many geometrical isomers are possible in the following coordination entities: `[Cr(C_2O_4)_3]^3-

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552. How many geometrical isomers are possible in the following co-ordination entity?

$\left[Co\left(NH_3\right)_3Cl_3\right]$

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553. Write the name of ionisation isomer of the compound $\left[Co\left(NH_3\right)_5Br\right]SO_4$.

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554. Write the following : Linkage isomer of $\left[Co\left(NH_3\right)_5ONO\right]Cl_2$

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555. Write the following : Coordination isomer of $\left[Cu\left(NH_3\right)_4\right]\left[PtCl_4\right]$

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556. True of False : All the ligands must contain at least one donor atom.

Watch Video Solution

557. True or False : All inner orbital complexes are diamagnetic.

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558. Explain: $\left[Ni(CN)_4\right]^{2-}$ is diamagnetic while $\left[Ni(Cl)_4\right]^{2-}$ is paramagnetic.

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559. True of False : Both $\left[Fe(CN)_6\right]^{4-}$ and $\left[FeF_6\right]^{3-}$ are outer orbital complexes.

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560. True of False : CN^- is a stronger field ligand than CO.

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561. True of False : All tetrahedral complexes show geometrical isomerism.

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562. True of False : $CoCl_3.3NH_3$ complex is non-conducting.

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563. Find the oxidation number of Fe in $\left[Fe(CO)_5\right]$

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564. True of False : The IUPAC name of $\left[Fe\left(C_2O_4\right)_3\right]^{3-}$ ion is tris(oxalato) ferrate (III) ion.

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565. Constantin alloy is a mixture. Explain how?

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566. True of False : Cis-isomer of $\left[CoCl_2(en)_2\right]^+$ shows optical isomerism but trans isomer does not.

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567. True of False : $\left[MnBr_4\right]^{2-}$ is tetrahedral complex and has 5 unpaired electrons.

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568. Write the following : Linkage isomer of $\left[Co\left(NH_3\right)_5ONO\right]Cl_2$

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569. $\left[Ni(CN)_4\right]^{2-}$ is diamagnetic and has ..... shape.

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570. The complex cis-$\left[P\left(NH_3\right)_2Cl_2\right]$ is used in treatment of cancer under the name .....

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571. The formula of the complex sodium tetracarbonyl cobaltate (-1) is ..... .

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572. The metal present in vitamin B_{12} is ..... and the metal present in chlorophyll is ..... .

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573. Monel metal alloy is a mixture. Explain how?

Watch Video Solution

574. The oxidation state of nickel in $K_4\left[Ni(CN)_4\right]$ is ..... .

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575. The coordination number of chromium in $\left[Cr(en)_2\left(NH_3\right)(NCS)\right]$ is ..... .

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576. The ligand NO is named as..... .

A. (a) Nitrosonium

B. (b) Nitronium

C. (c) Nitrosyl

D. (d) Nitro

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577. Express 2205 in roman numbers.

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578. In the complex [Co(EDTA)] the coordination number of cobalt is ..... .

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579. $\left[Co\left(NH_3\right)_6\right]^{3+}$ is an..... orbital complex and is..... in nature.

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580. In octahedral crystal field splitting, the three orbitals are called ..... and two orbitals are called ..... .

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581. The spin magnetic moment of the complex $\left[Fe(CN)_6\right]^{4-}$ is ..... .

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582. $\left[Fe(CN)_6\right]^{3-}$ ion has ..... unpaired electrons and $\left[Fe\left(H_2O\right)_6\right]^{3+}$ has ..... unpaired electrons.

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583. Choose the correct alternative : The complex $\left[Ni(CO)_4\right]$ is square planar / tetrahedral.

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584. The complex $\left[Co(en)_2Cl_2\right]^+$ has 3/4 geometrical and optical isomers.

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585. Triethylene tetraammine is a tridentate /tetradentateligand.

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586. The commercial name for calcium hydroxide is-

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587. The number of ions produced per mole of the complex $Co\left(NH_3\right)_5Cl_3$ is 3 mol/2 mol.

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588. The complexes $\left[Co\left(NH_3\right)_6\right]\left[Cr(CN)_6\right]$ and $\left[Cr\left(NH_3\right)_6\right]\left[Co(CN)_6\right]$ are examples of coordination isomerism/ coordination position isamerism.

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589. Out of cis and trans form of $\left[RhCl_2(en)_2\right]^+$, cis/trans form shows optical activity.

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590. The magnetic moment of ferricyanide ion is more/less than that of ferrocyanide ion.

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591. $\left[NiCl_4\right]^{2-}$ is diamagnetic/ paramagnetic.

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592. The crystal field splitting of tetrahedral complexes is more /less than octahedral complexes.

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593. Which metal is constituent of haemoglobin?

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594. CN^- is stronger /weaker ligand than NH_3.

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595. Name the central metal atom present in haemoglobin and chlorophyll.

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596. Name one example of a hexadentate ligand.

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597. What is meant by chelating ligand ? Give one example.

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598. Write the chemical formula for the complex compound : Sodium (ethylene diammine tetra acetate) chromate(II).

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599. Write IUPAC name of $Na_3\left[Co\left(NO_2\right)_6\right]$.

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600. Give the chemical formula of the compound potassium trioxalatoferrate (III).

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601. Give the IUPAC name of the ionisation isomer of $\left[Pt\left(NO_2\right)\left(H_2O\right)\left(NH_3\right)_2\right]Br$.

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602. Write the name of the coordination isomer of the complex $\left[Co(en)_3\right]\left[Cr(CN)_6\right]$.

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603. Write IUPAC name of $K_3\left[Fe(CN)_5NO\right]$.

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604. Express 2213 in roman numbers.

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605. The chemical formula of caustic lime is-

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606. Write the IUPAC name of $\left[CoBr_2(en)_2\right]Cl$.

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607. Write the IUPAC name of the $\left[Co\left(NH_3\right)_5ONO\right]Cl_2$

Watch Video Solution

608. Write the IUPAC name of $\left[CoCl\left(NH_3\right)_5\right]Cl_2$.

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609. Write the formula of pentaaminenitrocobalt (III) chloride.

Watch Video Solution

610. Define Bidentate ligands and give example.

Watch Video Solution

611. Which of the following is expected to be more stable : $\left[Co(en)_3\right]^{3+}$ or $\left[Co\left(NH_3\right)_6\right]^{3+}$?

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612. Give an example of coordination compound used in medicines.

Watch Video Solution

613. Give an example of coordination isomerism.

Watch Video Solution

614. Give one example of linkage isomer.

Watch Video Solution

615. Express 2215 in roman numbers.

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616. The coordination number of cobalt in $\left[Co(en)_3\right]^{3+}$ is

A. 3

B. 4

C. 6

D. 2

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617. Write the IUPAC name of $K_3\left[Fe(CN)_5NO\right]$.

A. potassium pentacyanonitrosylferrate (II)

B. potassium pentacyanonitroferrate (II)

C. potassium pentacyanonitrosylferrate (III)

D. tripotassium pentacyanonitrosylferrate (II)

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618. Which of the following is hexadentate ligand?

A. diene

B. CN^-

C. en

D. EDTA

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619. On adding $AgNO_3$ solution to 1 mole of $PdCl_2.4NH_3$, two moles of AgCl are formed. The secondary valency of Pd in the complex will be

A. 0

B. 2

C. 4

D. 1

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620. Namethe type of isomerism exhibited bythe following pair of isomers. $\left[Cr\left(H_2O\right)_6\right]Cl_3$ and $\left[Cr\left(H_2O\right)_5Cl\right]Cl_2.H_2O$

A. Linkage isomerism

B. Solvate isomerism

C. Ionisation isomerism

D. Coordination isomerism

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621. Write IUPAC name of : $\left[PtCl\left(NO_2\right)\left(NH_3\right)_4SO_4\right.$.

A. Tetraamminechloridonitrito-N-platinate (III)sulphate

B. Tetraamminechloridonitrito-N-platinum (IV) sulphate

C. Chloridonitrito-N-ammineplatinum (IV) sulphate

D. Tetraamminechloridonitrito-N-platinate (IV) sulphate

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622. which metal is present in vitamin B_{12} or cyanocobalamin?

A. Fe

B. Co

C. Mg

D. Pt

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623. Which is present in metal carbonyls?

A. M-C σ bond

B. M-C π bond

C. M-C σ and M-C π bond

D. None of these

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624. How many ions are given by $\left[Co\left(NH_3\right)_5Br\right]Cl_2$ complex in water?

A. 4

B. 2

C. 6

D. 3

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625. Express 2216 in roman numbers.

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626. Express 2217 in roman numbers.

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627. What type of isomerism is shown by the following complex , $\left[Co\left(NH_3\right)_6\right]\left[Cr(CN)_6\right]$?

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628. Namethe type of isomerism exhibited bythe following pair of isomers. $\left[Pt\left(NH_3\right)_4Cl_2\right]Br_2$ and $\left[Pt\left(NH_3\right)_4Br_2\right]Cl_2$.

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629. Express 2218 in roman numbers.

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630. What is meant by coordination number ? Write the coordination number of Cu in $\left[Cu\left(NH_3\right)_4\right]^{2+}$ complex ion.

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631. How does valence bond theory account for :

$\left[Ni\left(CN_4\right)\right](2 -)$ is diamagnetic and square planar.

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632. A metal ion M^{n+} having d^4 valence electronic configuration combines with three didentate ligands to form a complex compound. Assuming $\Delta_0 > P$

draw the diagram showing d orbital splitting during this complex formation.

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633. Calcium hydroxide is also called-

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634. Express 2221 in roman numbers.

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635. A metal ion M^{n+} having d^4 valence electronic configuration combines with three didentate ligands to form a complex compound. Assuming $\Delta_0 > P$

draw the diagram showing d orbital splitting during this complex formation.

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636. Express 2220 in roman numbers.

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637. Explain as to how the two complexes of nickel, $\left[Ni(CN)_4\right]^{2-}$ and $\left[Ni(CO)_4\right]$ have different structure but they donot differ in their magnetic behaviour.

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638. For the complex $\left[Fe(en)_2Cl_2\right]Cl$, identify the following : Oxidation number of iron.

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639. Goldsmith dissolves gold in a special type of mixture called-

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640. Express 2222 in roman numbers.

Watch Video Solution

641. For the complex $\left[Fe(en)_2Cl_2\right]Cl$, identify the following : Name of the complex.

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642. Express 2223 in roman numbers.

Watch Video Solution

643. For the complex $\left[Fe(en)_2Cl_2\right]Cl$, identify the following : Name of the complex.

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644. How does valence bond theory account for :

$\left[Ni\left(CN_4\right)\right](2 -)$ is diamagnetic and square planar.

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645. Express 2225 in roman numbers.

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646. State a reason for the following situation : The molecular shape of $Ni(CO)_4$ is not the same as that of $\left[Ni(CN)_4\right]^{2-}$?

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647. Write the IUPAC name of following :

[Cr(NH_3)_3 (H_2O)_3]Cl_3`

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648. Write the IUPAC name of the following : $K_3\left[Al\left(C_2O_4\right)_3\right]$

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649. Brass alloy is a mixture. Explain how?

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650. trans isomer of the complex $\left[Co(en)_2Cl_2\right]^+$ is optically inactive. Why ?

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651. Express 2226 in roman numbers.

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652. Explain why $\left[Ti\left(H_2O\right)_6\right]^{3+}$ is violet while $\left[Ti\left(H_2O\right)_6\right]^{4+}$ is colourless.

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653. Write IUPAC name of the following : $\left[Cr\left(NH_3\right)_3Cl_3\right]$

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654. Write IUPAC name of the following : $K_3\left[Fe(CN)_6\right]$

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655. Write the IUPAC name of the compound : $\left[CoBr_2(en)_2\right]^+$ (en = ethylenediamine)

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656. Write the types of isomerism exhibited by the following complex : $\left[Co\left(NH_3\right)_5Cl\right]SO_4$

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657. What type of isomerism is exhibited by the complex $\left[Co(en)_3\right]^{3+}$?

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658. What type of isomerism is shown by the following complex , $\left[Co\left(NH_3\right)_6\right]\left[Cr(CN)_6\right]$?

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659. Give the enantiomers of $\left[CoBr_2(en)_2\right]^+$.

Watch Video Solution

660. Draw the geometrical isomers of $\left[Co(en)_2CI_2\right]^+$ ion.Which of these is optically active ?

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661. Which of the following is expected to be more stable : $\left[Co(en)_3\right]^{3+}$ or $\left[Co\left(NH_3\right)_6\right]^{3+}$?

Watch Video Solution

662. Write the IUPAC name of the complex $\left[Cr\left(NH_3\right)_4Cl_2\right]^+$ .What type of isomerism does it exhibit ?

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663. Write two difference between double salt and complex compound.

Watch Video Solution

664. What is spectrochemical series?

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665. Write the formulae of the following using IUPAC rules: Potassium tatrachloridonickelate (II).

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666. Write the formulae of the following using IUPAC rules: Diamminechloridonitrito-N -platinum (II).

Watch Video Solution

667. Write the formulae of the following using IUPAC rules: Potassium tatrachloridonickelate (II).

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668. Define chelate and chelating ligand. Give one example of chelate complex.

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669. Primary valency of central metal atom/ion in $\left[Co\left(NH_3\right)_6\right]Cl_3$.

A. 3

B. 6

C. 4

D. 9

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670. Discuss the main postulates of Werner's coordination theory.

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671. Write the IUPAC name of $K_3\left[Fe(CN)_6\right]$, [Co(NH_3)_6]Cl_3` .

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672. Using valence bond theory, write the type of hybridisation involved, geometry and magnetic behaviour of $\left[CoF_6\right]^{3-}$ and

$Co\left(NH_3\right)_6]^{3+}$ complexes.

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673. Draw the geometrical isomers of $\left[Pt\left(NH_3\right)_2.CI_2\right]$. Which of these is optically active.

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674. On the basis of crystal field theory, write the electronic configuration of d^4 ion if $\Delta_0 < P$.

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675. Write the hybridization and magnetic behaviour of the complex $\left[Ni(CO)_4\right]$. (At no. if Ni=28).

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676. Write the IUPAC name of the following : $\left[Cr\left(NH_3\right)_2Cl_2(en)\right]Cl$

Watch Video Solution

677. Using IUPAC norms write the formulas for the following: Pentaaminenitrito-O-coblt (III)

Watch Video Solution

678. Write the IUPAC name of the following coordination compound :

$\left[Co\left(H_2O\right)_3BrClNO_2\right]$

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679. Write the IUPAC name of the following coordination compound :

$K_3\left[Cr\left(C_2O_4\right)_3\right]$

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680. Define co-ordination number.

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681. Bronze alloy is a mixture. Explain how?

Watch Video Solution

682. Give an example of coordination compound used in medicines.

Watch Video Solution

683. Onthe basis of valence bond theory explain the structure and magnetic nature of `[Fe(CN)_6]^(3_) complex ion.

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684. Express 2228 in roman numbers.

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685. On the basis of VBT, show that $\left[CoF_6\right]^{3-}$ is paramagnetic.

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686. Write the IUPAC name of the following compound: $\left[\left(Cr\left(NH_3\right)_4Cl_2\right]Cl\right.$

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687. Write the shape and magnetic behaviour of the following complex : $\left[Co\left(NH_3\right)_6\right]^{3+}$

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688. Write the shape and magnetic behaviour of the following complex : $\left[Ni(CN)_4\right]^{2-}$

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689. Write the formula of lithium tetrahydridoalumniate (III).

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690. Express 2230 in roman numbers.

Watch Video Solution

691. Write down the ionization isomer of $\left[Co\left(NH_3\right)_5Cl\right]SO_4$.

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692. Write the IUPAC name of the compound : $\left[Co\left(NH_3\right)_5Cl\right]SO_4$.

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693. NiCl4 2- is paramagnetic while NiCO4 is diamagnetic though both are tetrahedral why

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694. $\left[Cr\left(NH_3\right)_6\right]^{3+}$ is paramagnetic while $\left[Ni(CN)_4\right]^{2-}$ is diamagnetic. Explain why?

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695. Express 2231 in roman numbers.

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696. Express 2232 in roman numbers.

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697. Express 2233 in roman numbers.

Watch Video Solution

698. Express 2235 in roman numbers.

Watch Video Solution

699. Express 2236 in roman numbers.

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700. For the complex $\left[Fe(CN)_6\right]^{3-}$, write the hybridization type, magnetic character and spin nature of the complex. (At. number : Fe = 26)

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701. Express 2237 in roman numbers.

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702. German silver alloy is a mixture. Explain how?

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703. Express 203 in roman numbers.

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704. Express 2252 in roman numbers.

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705. Express 2250 in roman numbers.

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706. Artificial gold alloy is a mixture. Explain how?

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707. Express 1251 in roman numbers.

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708. Write the state of hybridization, the shape and the magnetic behaviour of the following complex entities : $K_2\left[Ni(CN)_4\right]$

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709. Express 2253 in roman numbers.

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710. Express 2255 in roman numbers.

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711. Explain the following : Low spin octahedral complexes of nickel are not known.

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712. Express 2256 in roman numbers.

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713. State a reason for the following situation : CO is a stronger complexing reagent than NH_3.

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714. Explain the following case giving appropriate reason : Nickel does not form low spin octahedral complexes.

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715. Explain the following case giving appropriate reason : The π-complexes are known for the transition metals only.

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716. Express 2257 in roman numbers.

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717. Express 2258 in roman numbers.

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718. Write the state of hybridization, the shape and the magnetic behaviour of the following complex entities : $\left[Co(en)_3\right]CI_3$

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719. Write the state of hybridization, the shape and the magnetic behaviour of the following complex entities : $K_2\left[Ni(CN)_4\right]$

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720. Name the following coordination entities and draw the structures of their stereoisomers : $\left[Co(en)_2Cl_2\right]^+$ (en = ethan-1, 2-diamine)

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721. Express 2375 in roman numbers.

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722. Name the following coordination entities and draw the structures of their stereoisomers : $\left[\left(Co\left(NH_3\right)_3Cl_3\right]\right.$ (Atomic numbers : Cr = 24, Co = 27)

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723. Name the following coordination entities and describe their structures : $\left[Fe(CN)_6\right]^{4-}$ (Atomic numbers : Fe = 26, Cr = 24, Ni = 28)

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724. Name the following coordination entities and describe their structures : $\left[Cr\left(NH_3\right)_4Cl_2\right]^+$ (Atomic numbers : Fe = 26, Cr = 24, Ni = 28)

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725. Name the following coordination entities and describe their structures : $\left[Ni(CN)_4\right]^{2-}$ (Atomic number : Ni = 28)

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726. For the complex $\left[NiCl_4\right]^{2-}$, write the IUPAC name. (Atomic no. of Ni = 28)

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727. For the complex $\left[NiCl_4\right]^{2-}$, write the hybridisation type. (Atomic no. of Ni = 28)

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728. For the complex $\left[NiCl_4\right]^{2-}$,write)the shape of the complex.

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729. Bell metal alloy is a mixture. Explain how?

Watch Video Solution

730. Write the formula for the following complex : Potassium tetracyanonickelate (II)

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731. Coin metal alloy is a mixture. Explain how?

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732. Gun metal alloy is a mixture. Explain how?

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733. $NiCl_4^{2-}$ is paramagnetic while $NiCO_4$ is diamagnetic though both are tetrahedral why

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734. Dutch metal alloy is a mixture. Explain how?

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735. When a coordination compound $NiCl_2.6H_2O$ is mixed wih $AgNO_3$, 2 moles of AgCl are precipitated per mole of the compound. Write IUPAC name of the complex.

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736. For the complex $\left[Fe(CN)_6\right]^{3-}$, write the hybridization type, magnetic character and spin nature of the complex. (At. number : Fe = 26)

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737. trans isomer of the complex $\left[Co(en)_2Cl_2\right]^+$ is optically inactive. Why ?

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738. Write the IUPAC name of $\left[Cu\left(H_2O\right)_2\left(NH_3\right)_4\right]SO_4$.

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739. What is the state of hybridisation and geometry in `[Ni(CN)_4]^(-2_)

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740. Define optical isomerism. Give one example of optical isomers.

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741. $\left[Ti\left(H_2O\right)_6\right]^{3+}$ is coloured while $\left[Sc\left(H_2O\right)_6\right]^{3+}$ is colourless. Explain.

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742. Explain : $\left[Co(CN)_6\right]^{3-}$ is diamagnetic while $\left[CoF_6\right]^{3-}$ is paramagnetic.

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743. Write the IUPAC name of the following :

$\left[Co\left(NH_3\right)_4\left(H_2O\right)(Cl)\right]Cl_2$

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744. Write IUPAC name of the following

$K_2\left[Zn(OH)_4\right]$

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745. Write IUPAC name of the following : $\left[Ag\left(NH_3\right)_2\right]\left[Ag(CN)_2\right]$

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746. Write IUPAC name of the following : $\left[Ni(CO)_4\right]$

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747. Write IUPAC name of the following : $\left[Pt\left(NH_3\right)_2Cl\left(NO_2\right)\right]$

Watch Video Solution

748. Explain, Why $\left[Ni(CO)_4\right]$ is diamagnetic whereas $\left[NiCl_4\right]^{2-}$ is paramagnetic ?

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749. Discuss five important applications of coordination compound.

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750. Explain that $\left[Co\left(NH_3\right)_6\right]^{3+}$ is a low spin complex while $\left[CoF_6\right]^{3-}$ is a high spin complex.

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751. Express 2280 in roman numbers.

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752. Express 2281 in roman numbers.

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753. Ethylenediamine is an example of:

A. monodentate ligand

B. bidentate ligand

C. tridentate ligand

D. polydentate ligand.

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754. How many ions are produced from $\left[Co\left(NH_3\right)_6\right]Cl_3$ in solution ?

A. 6

B. 4

C. 3

D. 2

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755. What is the oxidation state of iron in $K_3\left[Fe(CN)_6\right]$?

A. $+2$

B. $+3$

C. $+4$

D. -3

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756. $\left[Co\left(NH_3\right)_5Br\right]SO_4$ and $\left[Co\left(NH_3\right)_5SO_4\right]Br$ are examples of which type of isomers ?

A. ionisation isomers

B. linkage isomers

C. coordination isomers

D. optical isomers.

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757. The colour of tetraamminecopper (II) sulphate is:

A. blue

B. red

C. violet

D. green.

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758. Vitamine B_{12} contains

A. magnesium

B. cobalt

C. iron

D. nickel.

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759. In which of the following the magnetic character is not correct ?

A. $CuCl_4^{2-}$: 1 unpaired electron

B. $\left[Fe\left(H_2O\right)_6\right]^{2+}$: 5 unpaired electrons

C. $\left[Zn\left(NH_3\right)_2\right]^{2+}$: Diamagnetic

D. $\left[CoF_6\right]^{3-}$: 4 unpaired electrons

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760. Wilkinson's catalyst used as a homogeneous catalyst in the hydrogenation of alkenes contains :

A. iron

B. aluminium

C. rhodium

D. cobalt.

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761. How many EDTA (ethylenediaminetetraacetic acid) molecules are required to make an octahedral complex with a Ca^{2+} ion ?

A. Three

B. One

C. Two

D. Six

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762. Which of the following is not true for CoF_6^{3-} ?

A. It is paramagnetic due to the presence of 4 unpaired electrons

B. It has coordination number of 6

C. It is outer orbital complex

D. It involved d^2sp^3 hybridisation

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763. Which of the following complexes is non-conducting ?

A. $CoCl_3.3NH_3$

B. $CoCl_3.6NH_3$

C. $CoCl_3.4NH_3$

D. $CoCl_3.5NH_3$

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764. Which compound is formed when excess of KCN is added to an aqueous solution of copper sulphate?

A. $Cu(CN)_2$

B. $K_2\left[Cu(CN)_2\right]$

C. $K\left[Cu(CN)_2\right]$

D. $K_3\left[Cu(CN)_4\right]$

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765. Which of the following ligand has lowest Δ_0 value ?

A. CN^-

B. CO

C. F^-

D. NH_3.

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766. Which of the following ligand is a strong field ligand ?

A. CO

B. H_2O

C. NH_3

D. Ox^{2-}.

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767. The colour of $\left[TiF_6\right]^{3-}$ (aq) is

A. black

B. blue

C. purple

D. white.

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768. Which of the following statement is not correct ?

A. $\left[Ni(CN)_4\right]^{2-}$ involves dsp^2 hybridisation

B. $\left[NiCl_4\right]^{2-}$ is tetrahedral

C. Fe(H_2O)_6]^(3+)` is inner orbital complex

D. Both $\left[Co(\otimes)_3\right]^{3-}$ and $\left[CoF_6\right]^{3-}$ are outer orbital complexes.

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769. Which of the following pairs contain only tetrahedral complexes ?

A. $\left[MnCl_4\right]^{2-}$ and $\left[Ni(CN)_4\right]^{2-}$

B. $\left[ZnCl_4\right]^{2-}$ and $\left[MnCl_4\right]^{2-}$

C. $\left[ZnCl_4\right]^{2-}$ and $\left[Ni(CN)_4\right]^{2-}$

D. $\left[Zn\left(NH_3\right)_4\right]^{2+}$ and $\left[Cu\left(NH_3\right)_4\right]^{2-}$

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770. The number of possible geometrical isomers for the complex $\left[Pt\left(NO_2\right)(py)\left(\left(NH_2OH\right)\left(NH_3\right)\right)\right]$ is

A. 2

B. 3

C. 4

D. 0

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771. Which of the following description of hybridisation is not correct ?

A. $FeF_6]^{3-} : sp^3d^2$

B. $Fe(CN)_6^{4-} : d^2sp^3$

C. $Cu\left(NH_3\right)_4^{2+} : sp^3$

D. $Ni(CO)_4 : sp^3$

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772. Which of the following is expected to be a paramagnetic complex ?

A. $\left[Ni\left(H_2O\right)_6\right]^{2+}$

B. $\left[Ni(CO)_4\right]$

C. $\left[Zn\left(NH_3\right)_2\right]^{2+}$

D. $\left[Co\left(NH_3\right)_6\right]$.

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773. The oxidation number of cobalt in $K\left[Co(CO)_4\right]$ is

A. $+1$

B. $+3$

C. -1

D. -3

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774. Which of the following is paramagnetic ?

A. $\left[Ni(CO)_4\right]$

B. $\left[Co\left(NH_3\right)_6\right]^{3+}$

C. $\left[Ni(CN)_4\right]^{2-}$

D. $\left[NiCl_4\right]^{2-}$

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775. The oxidation state of Fe in the brown ring complex $\left[Fe\left(H_2O_5\right)NO\right]SO_4$ is

A. $+1$

B. $+2$

C. $+3$

D. +4

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776. The IUPAC name of the complex $\left[P\left(NH_3\right)_3Br\left(NO_2\right)Cl\right]Cl$ is

A. Triamminechlorobromonitroplatinum (IV) chloride

B. Triamminebromonitrochloroplatinum (IV) chloride

C. Triamminebromidochloridonitroplatinum (IV) chloride

D. Triamminenitrochlorobromoplatinum (IV) chloride

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777. A coordination complex compound of cobalt has molecular formula containing five ammonia molecules, one nitro group and two chlorine atoms for one cobalt atom. One mole of this compound produces three mole ions in an aqueous solution. On reacting this solution with excess of silver nitrate solution, two moles of AgCl get precipitated. The formula of this compound would be

A. $\left[Co\left(NH_3\right)_4\left(NO_2\right)Cl\right]\left[NH_3\right)Cl\right]$

B. $\left[Co\left(NH_3\right)_5Cl\right]\left[Cl\left(NO_2\right)\right]$

C. $\left[Co\left(NH_3\right)_5\left(NO_2\right)\right]Cl_2$

D. $\left[Co\left(NH_3\right)_5\right]\left[\left(NO_2\right)Cl_2\right]$

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778. Which statement is incorrect ?

A. $Ni(CO)_4$ - tetrahedral, paramagnetic

B. $Ni(CN)_4^{2-}$ -square planar, diamagnetic

C. $Ni(CO)_4$ -tetrahedral, diamagnetic

D. $NiCl_4^{2-}$ -tetrahedral, paramagnetic.

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779. In the complexs more stability is shown by

A. $\left[Fe\left(H_2O\right)_6\right]^{3+}$

B. $\left[Fe(CN)_6\right]^{3-}$

C. $\left[Fe\left(C_2O_4\right)_3\right]^{3-}$

D. $\left[FeCl_6\right]^{3-}$

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780. Ammonia forms the complex ion $\left[Cu\left(NH_3\right)_4\right]^{2+}$ with copper ions in alkaline solutions but not in acidic solution. The reason for this is

A. In acidic solutions, protons coordinate with ammonia molecules forming NH_4^+ ions and NH_3 molecules are not available.

B. In alkaline solutions, insoluble $Cu(OH)_2$ is precipitated which is soluble in excess of any alkali.

C. Copper hydroxide is an amphoteric substance.

D. In acidic solutions, hydration protects copper ions.

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781. One mole of complex compound $Co\left(NH_3\right)_5Cl_3$ give 3 moles of a ions on dissolution in water. One mole of the same complex reacts with two moles of $AgNO_3$ solution to yield two moles of AgCl(s). The structure of the complex is

A. $\left[Co\left(NH_3\right)_3Cl_3\right].2NH_3$

B. $\left[Co\left(NH_3\right)_4Cl_2\right]Cl.\,NH_3$

C. $\left[Co\left(NH_3\right)_4Cl\right]Cl_2.\,NH_3$

D. $\left[Co\left(NH_3\right)_5Cl\right]Cl_2$

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782. Magnelium alloy is a mixture. Explain how?

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783. $\left[Cr\left(H_2O\right)_6\right]Cl_3$ (At. no. of Cr = 24) has a magnetic moment of 3.83 B.M. The correct distribution of 3d electrons in the chromium of the complex is :

A. $3d_{xy}^1, 3d_{x^2-y^2}^1, 3d_{xy}^1$

B. $3d_{xy}^1, 3d_{yz}^1, 3d_{zx}^1$

C. $3d_{xy}^1, 3d_{zy}^1, 3d_{z^2}^1$

D. $3d_{x^1-y^2}^1, 3d_{z^2}^1, 3d_{xz}^1$

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784. In which of the following coordination entities the magnitude of Δ_0 (CFSE in octahedral field) will be maximum ? (At. no. Co = 27)

A. $\left[Co\left(NH_3\right)_6\right]^{3+}$

B. $\left[Co(CN)_6\right]^{3-}$

C. $\left[Co\left(C_2O_4\right)_3\right]^{3-}$

D. $\left[Co\left(H_2O\right)_6\right]^{3+}$

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785. Express 2260 in roman numbers.

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786. Express 1226 in roman numbers.

Watch Video Solution

787. Express 1226 in roman numbers.

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788. Crystal field stabilisation energy for high spin d^4 octahedral complex is :

A. $-1.2\Delta_0$

B. $-0.6\Delta_0$

C. $-1.8\Delta_0$

D. $-1.6\Delta_0 + P$

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789. The complexes $\left[Co\left(NH_3\right)_6\right]\left[Cr(CN)_6\right]$ and $\left[Cr\left(NH_3\right)_6\right]\left[Co(CN)_6\right]$ are the examples of which type of isomerism ?

A. Linkage isomerism

B. Ionization isomerism

C. Coordination isomerism

D. Geometrical isomerism

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790. The complex, $\left[Pt\left(Py\left(NH_3\right)BrCl\right]\right.$ will have how many geometrical isomers ?

A. 3

B. 4

C. 0

D. 2

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791. The d-electron configurations of Cr^{2+}, Mn^{2+}, Fe^{2+} and Co^{2+} are d^4, d^5, d^6 and d^7 respectively. Which one of the following will exhibit minimum paramagnetic behaviour ? (At. nos. Cr = 24, Mn = 25, Fe = 26, Co = 27)

A. $\left[Mn\left(H_2O\right)_6\right]^{2+}$

B. $\left[Fe\left(H_2O\right)_6\right]^{2+}$

C. $\left[Co\left(H_2O\right)_6\right]^{2+}$

D. $\left[Cr\left(H_2O\right)_6\right]^{2+}$

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792. Of the following complex ions, which is diamagnetic in nature ?

A. $\left[NiCl_4\right]^{2-}$

B. $\left[Ni(CN)_4\right]^{2-}$

C. $\left[CuCl_4\right]^{2-}$

D. $\left[CoF_6\right]^{3-}$

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793. Which one of the following is an outer orbital complex and exhibits paramagnetic behaviour ?

A. $\left[Ni\left(NH_3\right)_6\right]^{2+}$

B. $\left[Zn\left(NH_3\right)_6\right]^{2+}$

C. $\left[Cr\left(NH_3\right)_6\right]^{3+}$

D. $\left[Co\left(NH_3\right)_6\right]^{3+}$

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794. A magnetic moment of 1.73 B.M. will be shown by one among of the following

A. $TiCl_4$

B. $\left[CoCl_6\right]^{4-}$

C. $\left[Cu\left(NH_3\right)_4\right]^{2+}$

D. $\left[Ni(CN)_4\right]^{2-}$

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795. An excess of $AgNO_3$ is added to 100mL of a 0.01 M solution of dichloridotetraaquachromium (III) chloride. The number of moles of AgCl precipitated would be

A. 0.003

B. 0.01

C. 0.001

D. 0.002

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796. Express 2263 in roman numbers.

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797. Which of the following complexes is used to be as an anticancer agent ?

A. *mer* - $\left[Co\left(NH_3\right)_3Cl_3\right]$

B. cis - $\left[PtCl_2\left(NH_3\right)_2\right]$

C. cis - $K_2\left[PtCl_2Br_2\right]$

D. Na_2CoCl_4

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798. The name of complex $\left[Fe(CN)_6\right]^{3-}$ is

A. Tricyanoferrate (III) ion

B. Hexacyanidoferrate (III) ion

C. Hexacyanoiron (III) ion

D. Hexacyanitoferrate (III) ion

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799. The hybridization involved in complex $\left[Ni(CN)_4\right]^{2-}$ is: (At No. Ni = 28)

A. d^2sp^2

B. d^2sp^3

C. dsp^2

D. sp^3

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800. The sum of coordination number and oxidation number of the metal M in the complex $\left[M(en)_2\left(C_2O_4\right)\right]Cl$ (where en is ethylenediamine) is:

A. 7

B. 8

C. 9

D. 6

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801. Number of possible isomers for the complex $\left[Co(en)_2Cl_2\right]Cl$ will be : (en = ethylenediamine)

A. 3

B. 4

C. 2

D. 1

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802. Magnetic moment 2.84 B.M. is given by: (At. nos. Ni = 28, Ti = 22, Cr = 24, Co = 27)

A. Cr^{2+}

B. Co^{2+}

C. Ni^{2+}

D. Ti^{3+}

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803. Cobalt (III) chloride forms several octahedral complexes with ammonia. Which of the following will not give test for chloride ions with silver nitrate at $25^{\circ}C$?

A. $CoCl_3.5NH_3$

B. $CoCl_3.6NH_3$

C. $CoCl_3.3NH_3$

D. $CoCl_3.4NH_3$

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804. Which of these statements about $\left[Co(CN)_6\right]^{3-}$ is true ?

A. $\left[Co(CN)_6\right]^{3-}$ has four unpaired electrons and will be in a high-spin configuration.

B. $\left[Co(CN)_6\right]^{3-}$ has no unpaired electrons and will be in a high-spin configuration.

C. $\left[Co(CN)_6\right]^{3-}$ has no unpaired electrons and will be in a low-spin configuration.

D. $\left[Co(CN)_6\right]^{3-}$ has four unpaired electrons and will be in a low-spin configuration.

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805. Which of the following has longest C-O bond length? (Free C-O bond length in CO is $1.128\overset{\circ}{A}$)

A. $\left[Fe(CO)_4\right]^{2-}$

B. $\left[Mn(CO)_6\right]^{+}$

C. $Ni(CO)_4$

D. $\left[Co(CO)_4\right]^{-}$

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806. Jahn-Teller effect is not observed in high spin complexes of

A. d^7

B. d^8

C. d^4

D. d^9

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807. When one mole of each of the following complex salts is treated with excess of $AgNO_3$, which of them gives maximum amount of AgCl ?

A. $\left[Co\left(NH_3\right)_6\right]Cl_3$

B. $\left[Co\left(NH_3\right)_5Cl\right]Cl_2$

C. $\left[Co\left(NH_3\right)_4Cl_2\right]Cl$

D. $Na_2\left[PtCl_6\right]$

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808. Duralumin alloy is a mixture of metals. Explain how?

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809. Express 2265 in roman numbers.

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810. Express 2266 in roman numbers.

Watch Video Solution

811. Express 1226 in roman numbers.

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812. 0.02 mole of $\left[Co\left(NH_3\right)_5Br\right]Cl_2$ and 0.02 mole of $\left[Co\left(NH_3\right)_5Cl\right]SO_4$ are present in 200 cc of a solution X. The number of moles of the precipitates Y and Z that are formed when the solution X is treated with excess silver nitrate and excess barium chloride are respectively

A. 0.02, 0.02

B. 0.01, 0.02

C. 0.02, 0.04

D. 0.04, 0.02

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813. The hybridization of central metal ion in $K_2\left[Ni(CN)_4\right]$ and $K_2\left[NiCl_4\right]$ are respectively

A. dsp^2, sp^3

B. sp^3, sp^3

C. dsp^2, dsp^2

D. sp^3, sp^3d^2

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814. Express 2268 in roman numbers.

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815. Nickel (Z = 28) combines with a uninegative monodentate ligand X to form a paramagnetic complex $\left[NiX_4\right]^{2-}$. The number of unpaired electron(s) in the nickel and geometry of this complex ion are, respectively

A. two, tetrahedral

B. one, square planar

C. two, square planar

D. one, tetrahedral

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816. In which of the following octahedral complexes of Co (At. no. 27) will the magnitude of Δ_0 be the highest ?

A. $\left[Co\left(NH_3\right)_6\right]^{3+}$

B. $\left[Co(CN)_6\right]^{3-}$

C. $\left[Co\left(C_2O_4\right)_3\right]^{3-}$

D. $\left[Co\left(H_2O\right)_6\right]^{3+}$

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817. Express 2270 in roman numbers.

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818. A solution containing 2.675 g of $CoCl_3.6NH_3$ (molar mass = 267.5 g mol^{-1}) is passed through a cation exchanger. The chloride ions obtained in solution were treated with excess of $AgNO_3$ to give 4.78 g of AgCl (molar mass = 143.5 g mol^{-1}). The formula of the complex is : (At. mass of Ag = 108 u)

A. $\left[CoCl_3\left(NH_3\right)_3\right]$

B. $\left[CoCl\left(NH_3\right)_5\right]Cl_2$

C. $\left[Co\left(NH_3\right)_6\right]Cl_3$

D. $\left[CoCl_2\left(NH_3\right)_4\right]Cl$

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819. Express 2302 in roman numbers.

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820. Express 2271 in roman numbers.

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821. Hydroleum alloy is a mixture of metal. Explain how?

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822. Among the ligands NH_3, en, CN^- and CO, the correct order of their increasing field strength is

A. $NH_3 < en < CN^- < CO$

B. $CN^- < NH_3 < CO < en$

C. $en < CN^- < NH_3 < CO$

D. $CO < NH_3 < en < CN^-$

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823. Express 2272 in roman numbers.

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824. Express 2273 in roman numbers.

Watch Video Solution

825. Express 2275 in roman numbers.

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826. The octahedral complex of a metal ion M^{3+} with four monodentate ligands L_1, L_2, L_3 and L_4 absorbs wavelengths in the region of red, green, yellow and blue, respectively. The increasing order of ligand strength of the four ligands is

A. $L_1 < L_2 < L_4 < L_3$

B. $L_4 < L_3 < L_2 < L_1$

C. $L_1 < L_3 < L_2 < L_4$

D. $L_3 < L_2 < L_4 < L_1$

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827. The number of possible geometrical isomers for the complex $\left[Pt\left(NO_2\right)(py)\left(\left(NH_2OH\right)\left(NH_3\right)\right)\right]$ is

A. 4

B. 6

C. 2

D. 3

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828. Nichrome alloy is a mixture. Explain how?

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829. Give the formula of following compound : mercury tetrabromidocobaltate(III)

A.

B.

C.

D.

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830. Express 2303 in roman numbers.

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831. Express 2276 in roman numbers.

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832. An excess of $AgNO_3$ is added to 100mL of a 0.01 M solution of dichloridotetraaquachromium (III) chloride. The number of moles of AgCl precipitated would be

A. 287×10^{-3}

B. 143.5×10^{-3}

C. 143.5×10^{-2}

D. 287×10^{-2}

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833. When 0.01 mole of a cobalt complex is treated with excess silver nitrate solution, 4.305 g silver chloride is precipitated. The formula of the complex is

A. $\left[Co\left(NH_3\right)_3Cl_3\right]$

B. $\left[Co\left(NH_3\right)_5Cl\right]Cl_2$

C. $\left[Co\left(NH_3\right)_6\right]Cl_3$

D. $\left[Co\left(NH_3\right)_4Cl_2\right]NO_3$

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834. In the brown ring complex $\left[Fe\left(H_2O\right)_5(NO)\right]SO_4$, nitric oxide behaves as

A. NO^+

B. neutral NO molecule

C. NO^-

D. NO^{2-}

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835. The atomic number of cobalt is 27. The EAN of cobalt in $Na_3\left[Co\left(NO_2\right)_4Cl_2\right]$ is

A. 35

B. 24

C. 36

D. 34

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836. Amongst $[NiCl_4]^{2-}$, $[Ni(H_2O)_6]^{2+}$, $[Ni(PPh_3)_2Cl_2]$, $[Ni(CO)_4]$ and $[Ni(CN)_4]^{2-}$, the paramagnetic species are

A. $[NiCl_4]^{2-}$, $[Ni(H_2O)_6]^{2+}$, $[Ni(PPh_3)_2Cl_2]$

B. $[Ni(CO)_4]$, $[Ni(PPh_3)_2Cl_2]$, $[NiCl_4]^{2-}$

C. $[Ni(CN)_4]^{2-}$, $[Ni(H_2O)_6]^{2+}$, $[NiCl_4]^{2-}$

D. $[Ni(PPh_3)_2Cl_2]$, $[Ni(CO)_4]$, $[NiCl_4]^{2-}$

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837. Amongst the following ions which one has the highest magnetic moment value ?

A. $[Co(NH_3)_6]^{3+}$

B. $\left[Cr\left(H_2O\right)_6\right]^{3+}$

C. $\left[Cr(CN)_6\right]^{3-}$

D. $\left[CoCl_6\right]^{3-}$

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838. Which one among the following is a homoleptic complex ?

A. Tris (ethane-1,2-diamine) cobalt (III) chloride

B. Triamminetriaquachromium (III) chloride

C. Diamminechloridonitrito- N-platinum (II)

D. Dichloridobis (ethane-1,2-diamine) cohalt(III) chloride

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839. The coordination number, oxidation number and the number of d-electrons in the metal ion of the complex $\left[CoCl_2(en)_2\right]Cl$ are respectively (atomic number of Co = 27)

A. 4,3 and 6

B. 6,2 and 6

C. 6,6 and 3

D. 6, 3 and 6

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840. The correct IUPAC name of $\left[Co\left(NH_3\right)_3\left(NO_2\right)_3\right]$ is

A. Triamminetrinitrito-N-cobalt (III)

B. Triamminetrinitrito-N-cobalt (II)

C. Triamminecobalt (III) nitrite

D. Triamminetrinitrito-N-cobaltate (III)

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841. $\left[Cr\left(NH_3\right)_6\right]\left[Cr(SCN)_6\right]$ and $\left[Cr\left(NH_3\right)_2(SCN)_4\right]\left[Cr\left(NH_3\right)_4(SCN)_2\right]$ are the examples of what type of isomerism ?

A. Ionisation isomerism

B. Linkage isomerism

C. Coordination isomerism

D. Solvate isomerism

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842. The molecular formula of Wilkinson catalyst, used in hydrogenation of alkenes is:

A. $Co(CO)_8$

B. $\left(Ph_3P\right)_3RhCl$

C. $\left[Pt\left(NH_3\right)_2Cl_2\right]$

D. $K\left[Ag(CN)_2\right]$.

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843. Consider the following two complex ions: $\left[CoF_6\right]^{3-}$ and $\left[Co\left(C_2O_4\right)_3\right]^{3-}$. Which of the following statement(s) is/are false? I. Both are octahedral. II. $\left[Co\left(C_2O_4\right)_3\right]^{3-}$ is diamagnetic while $\left[CoF_6\right]^{3-}$ is paramagnetic. III. Both are outer orbital complexes. IV.

Inboth the complexes the central metal is in the same oxidation state.

A. I and III

B. II, III and IV

C. III only

D. III and IV

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844. Express 2277 in roman numbers.

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845. Express 2278 in roman numbers.

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846. Express 862 in roman numbers.

Watch Video Solution

847. Express 843 in roman numbers.

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848. As per IUPAC norms, the name of the complex $\left[Co(en)_2(ONO)Cl\right]Cl$ is

A. Chloridobis (ethane-1,2-diamine)nitrito-O-cobalt (III) chloride.

B. Chlorobis(ethylenediamine)nitro-O-cobalt (III) chloride.

C. Chloridodi(ethylene diamine)nitrocobalt (III) chloride.

D. Chloroethylenediaminenitro-O-cobalt (III) chloride.

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849. Express 2285 in roman numbers.

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850. Aluminium bronze alloy is a mixture. Explain the statement?

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851. Give the formula of following compound : tris (ethylene diamine) cobalt(III)chloride

A.

B.

C.

D.

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852. Express 207 in roman numbers.

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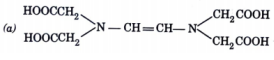
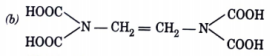
853. The correct structure of ethylenediamine tetraacetic acid (EDTA) is :

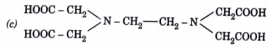
A.



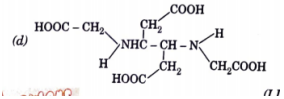
B.



C.



D.



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854. Give the formula of following compound : sodium hexanitrito-N-cobaltate(III)

A.

B.

C.

D.

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855. Express 2286 in roman numbers.

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856. Among the following complexes $(K\text{ - }P)$, $K_3\left[Fe(CN)_6\right](K)$, $\left[Co\left(NH_3\right)_6\right]Cl_3(L), Na_3\left[Co(\otimes alate)_3\right](M)$, $\left[Ni\left(H_2O_6\right)Cl_2(N), K_2\left[Pt(CN)_4\right](O)\right.$ and $\left.\left[Zn\left(H_2O_6\right)\right]\left(NO_3\right)_2(P)\right.$ the diamagnetic complexes are

A. K,L,M,N

B. K,M,O,P

C. L,M, O, P

D. L,M,N,O

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857. Express 867 in roman numbers.

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858. Solder alloy is a mixture. Explain how?

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859. The equation which is balanced and represents the correct product(s) is

A. $CuSO_4 + 4KCN \rightarrow K_2\left[Cu(CN)_4\right] + K_2SO_4$

B. $Li_2O + 2KCl \rightarrow 2LiCl + K_2O$

C. $\left[CoCl\left(NH_3\right)_5\right]^+ + 5H^+ \rightarrow Co^{2+} + 5NH_4^+ + Cl^-$

D. $\left[Mg\left(H_2O\right)_6\right]^{2+} + (EDTA)^{4-} \xrightarrow{excessNaOH} \left[Mg(EDTA)^{2+} + 6H_2O\right]$

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860. Express 1212 in roman numbers.

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861. Express 2288 in roman numbers.

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862. Give the formula of following compound : hexaamminecobalt(III)carbonate

A.

B.

C.

D.

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863. Express 2300 in roman numbers.

Watch Video Solution

864. Express 203 in roman numbers.

Watch Video Solution

865. Which of the following are square planar complexes ?

A. $\left[Pt\left(CN_4\right)\right]^{2-}$

B. $\left[NiCl_4\right]^{2-}$

C. $\left[Zn\left(NH_3\right)_4\right]^{2+}$

D. $\left[Cu\left(NH_3\right)_4\right]^{2-}$

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866. Which of the following are outer orbital complexes ?

A. $\left[Fe\left(H_2O\right)_6\right]^{3+}$

B. $\left[CoF_6\right]^{3-}$

C. $\left[Fe(CN)_6\right]^{4-}$

D. $\left[Fe(CN)_6\right]^{3-}$

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867. The compound(s) that exhibit(s) geometrical isomerism is (are)

A. $\left[Pt(en)Cl_2\right]$

B. $\left[Pt(en)_2\right]Cl_2$

C. $\left[Pt(en)_2Cl_2\right]Cl_2$

D. $\left[Pt\left(NH_3\right)_2Cl_2\right]$

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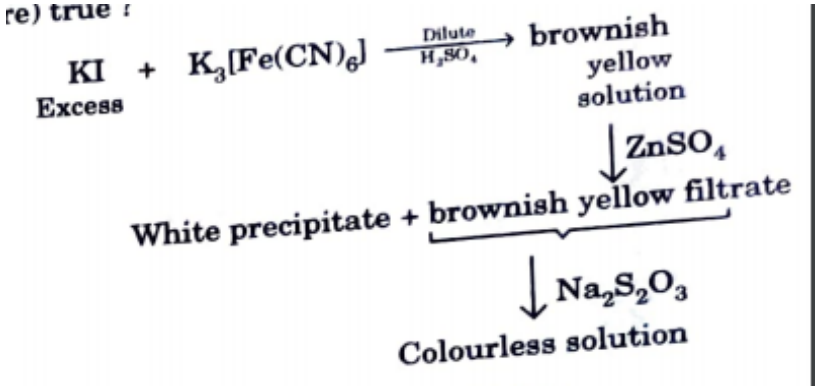
868. For the given aqueous reactions, which of the statement(s) is (are) true ?



A. The first reaction is a redox reaction.

B. White precipitate is $Zn_3\left[Fe(CN)_6\right]_2$.

C. Addition of filtrate to starch solution gives blue colour.

D. White precipitate is soluble in NaOH solution.

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869. Express 2305 in roman numbers.

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870. Express 2306 in roman numbers.

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871. Optical isomerism is exhibited by (ox = oxalate anion en = ethylenediamine)

A. *cis* - $\left[CrCl_2(Ox)_2\right]^{3-}$

B. $\left[Co(en)_3\right]^{3+}$

C. *trans* - $\left[CrCl_2(Ox)_2\right]^{3-}$

D. $\left[Co(Ox)(en)_2\right]^{+}$

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872. $Ni^{2+} \xrightarrow{KCN}$ Complex 1 $Ni^{2+} \xrightarrow{excess} KCI$ Complex 2 Both the above complexes have coordination number 4. Answer the following (1-3) questions : The IUPAC names for the complexes are respectively

A. Potassium tetracyanonickelate (II) and potassium tetrachloronickelate (II)

B. Potassium tetracyanonickel (II) and potassium tetrachloronickel (II)

C. Potassium tetracyanonickel and potassium chloronied.

D. Potassium tetracyanonickelate (II) and potassium tetrachloronickel (II)

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873. Express 2308 in roman numbers.

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874. Express 2310 in roman numbers.

Watch Video Solution

875. Express 2311 in roman numbers.

Watch Video Solution

876. Express 2313 in roman numbers.

Watch Video Solution

877. Express 203 in roman numbers.

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878. Give the formula of following compound : sodium tetracyanidonickelate(II)

A.

B.

C.

D.

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879. Iron forms a many complexes in its +2 and +3 oxidation states such as $\left[Fe\left(H_2O\right)_6\right]^{2+}(A)$, $\left[Fe(CN)_6\right]^{4-}(B)$, $\left[Fe\left(H_2O\right)_6\right]^{3+}(C)$, $\left[Fe(CN)_6\right]^{3-}(D)$, etc. They exhibit different magnetic properties and undergo

different hybridisation of iron. Which of the following statements is wrong ?

A. (A) is paramagnetic while (B) is diamagnetic

B. Both (B) and (D) are inner orbital complexes,

C. Both (A) and (C) are paramagnetic.

D. (A) is outer orbital complex and (C) is inner orbital

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880. Give the formula of following compound : sodium trioxalatochromate(III)

A.

B.

C.

D.

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881. Fill in the blanks- Mixture of _____ and _____ is used in the treatment of respiratory diseases.

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882. Express 2316 in roman numbers.

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883. Express 2317 in roman numbers.

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884. Give the formula of following compound : potassium tetrachloridopalladate(II)

A.

B.

C.

D.

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885. Express 2320 in roman numbers.

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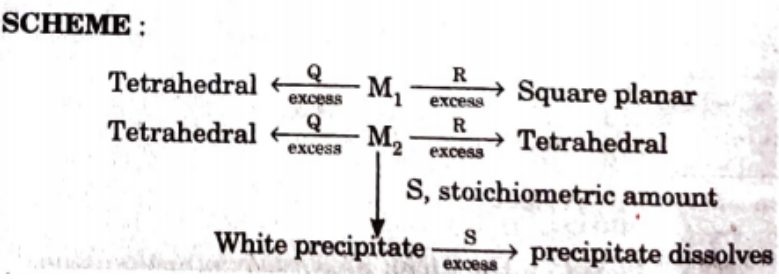
886. An aqueous solution of metal ion M_1 reacts separately with reagents Q and R in excess to give tetrahedral and square planar complexes, respectively. An aqueous solution of another metal ion M_2 always forms tetrahedral complexes with these reagents. Aqueous solution of M_2 on reaction with reagent S gives white precipitate which dissolves in excess of S. The reactions are summarized in the scheme given below :

SCHEME :



$M1$, Q and R, respectively are :

A. Zn^{2+}, KCN and HCl

B. Ni^{2+}, HCl and KCN

C. Cd^{2+}, KCN and HCl

D. KOH

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887. Give the formula of following compound : diamminechloridonitrito-N-platinum(II)

A.

B.

C.

D.

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888. Give the formula of following compound : pentaamminenitrito-N-cobalt(III)

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889. Give the formula of following compound : pentaamminenitrito-O-cobalt(III)

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890. Assertion : NF_3 is weaker ligand than $N\left(CH_3\right)_3\Big)$. Reason : NF_3 ionises to give F^- ions in aqueous solution.

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891. Give the formula of following compound tetraamminechloridonitrito-N-platinum(IV)sulphate

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892. Assertion : $\left[Ni(CO)_4\right]$ is diamagnetic and tetrahedral in shape. Reason : $\left[Ni(CO)_4\right]$ contains no unpaired electron and involves dsp^2 hybridisation.

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893. Give the formula of following compound : potassium trioxalatoaluminate(III)

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894. Give the formula of following compound : amminedichlorido(pyridine)platinum(II)

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895. Give the formula of following compound : sodium amminebromidochloridonitrito-N-platinate(II)

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896. Give the formula of following compound : triamminetrichloridochromium(III)

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897. Give the formula of following compound : potassium hexacyanidoferrate(II)

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898. Give the formula of following compound : sodium hexaflouridoaluminate(III)

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899. Give the formula of following compound : tris (ethylene diamine) cobalt(III)sulphate

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900. Alanko is a mixture of different metals. Explain this statement and one use of alanko?

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901. Is the iupac name of compound is correct ? $K_2\left[PtCl_4\right]$

potassium tetrachloridoplatinate(II)

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902. Manganese steel is an alloy and is made of different metals. Explain this statement with one use of manganese steel?

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903. Is the iupac name of compound is correct ? $Na_2[NiEDTA]$

sodium ethylenediaminetetraacetatenickel(II)

A.

B.

C.

D.

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904. The answer to each of the following question is a single- digit-integer ranging from 0 to 9. Darken the correct digit. The number ofions per mole of the complex $\left[PtCl\left(NH_3\right)_5\right]Cl_3$ is

0	1	2	3	4	5	6	7	8	9

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905. The coordination number of metal M in the complex $\left[M(en)\left(C_2O_4\right)_2ClBr\right]^-$ is

0	1	2	3	4	5	6	7	8	9

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906. Is the iupac name of compound is correct ? $K\left[Ag(CN)_2\right]$

potassium dicyanidosilver(I)

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907. In $\left[Fe\left(H_2O\right)_6\right]^{3+}$, the magnetic moment corresponds to number of unpaired electrons equal to

0	1	2	3	4	5	6	7	8	9

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908. Express 2357 in roman numbers.

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909. For the octahedral complexes of Fe^{3+} in SCN^- (thiocyanato-S) and in CN^- ligand environments, the difference between the spin-only magnetic moments in Bohr magnetons (when approximated to the nearest integer) is [Atomic number of Fe = 26]

0	1	2	3	4	5	6	7	8	9

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910. Chromium steel is an alloy which is a mixture of different metals. Explain this statement with one use of chromium steel?

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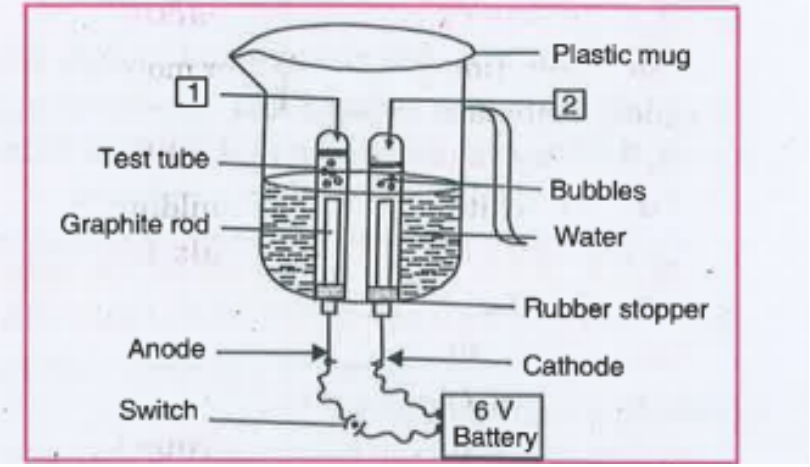
911. What is shown in the figure given a head? Also indicate1 and 2 in the figure



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912. Express 2356 in roman numbers.

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913. Which of the following complexes formed by Cu^{2+} ions is most stable ?

A. $Cu^{2+} + 4NH_3 \leftrightarrow \left[Cu\left(NH_3\right)_4\right]^{2+}$, log K =11.6

B. $Cu^{2+} + 4CN^- \leftrightarrow \left[Cu(CN)_4\right]^{2-}$, log K =27.3

C. $Cu^{2+} + 2en \leftrightarrow \left[Cu(en)_2\right]^{2+}$, log K =15.4

D. $Cu^{2+} + 4H_2O \leftrightarrow \left[Cu\left(H_2O\right)_4\right]^{2+}$, log K = 8.9

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914. What will be the correct order for the wavelengths of absorption in the visible region for the following: $\left[Ni\left(NO_2\right)\right)6]^{4-}$, $\left[Ni\left(NH_3\right)_6\right]^{2+}$, $\left[Ni\left(H_2O\right)_6\right]^{2+}$?

A. $\left[Co(CN)_6\right]^{3-} > \left[Co\left(NH_3\right)_6\right]^{3+} > \left[Co\left(H_2O\right)_6\right]^{3+}$

B. $\left[Co\left(NH_3\right)_6\right]^{3+} > \left[Co\left(H_2O\right)_6\right]^{3+} > \left[Co(CN)_6\right]^{3-}$

C. $Co\left(H_2O\right)_6]^{3+} > \left[Co\left(NH_3\right)_6\right]^{3+} > \left[Co(CN)_6\right]^{3-}$

D. $\left[Co(CN)_6\right]^{3-} > \left[Co\left(NH_3\right)_6\right]^{3+} > Co\left(H_2O\right)_6]^{3+}$

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915. When 0.1 mol $CoCl_3\left(NH_3\right)_5$ is treated with excess of $AgNO_3$, 0.2 mol of AgCl are obtained. The conductivity of solution will correspond to

A. 1:3 electrolyte

B. 1:2 electrolyte

C. 1:1 electrolyte

D. 3:1 electrolyte

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916. When 1 mol $CrCl_3.6H_2O$ is treated with excess of $AgNO_3$, 3 3 mol of AgCl are obtained. The formula of the complex is:

A. $CrCl_3\left(H_2O\right)_3\Big].3H_2O$

B. $CrCl_2\left(H_2O\right)_4\Big]Cl.2H_2O$

C. $CrCl\left(H_2O\right)_5\Big]Cl_2.H_2O$

D. $Cr\left(H_2O\right)_6\Big]Cl_3$

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917. The correct IUPAC name of $\left[Pt\left(NH_3\right)_2Cl_2\right]$ is:

A. Diamminedichloridoplatinum (II)

B. Diamminedichloridoplatinum (IV)

C. Diamminedichloridoplatinum (0)

D. Dichloridodiammineplatinum (IV)

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918. Which of the following is most acidic?

A. [Fe(CO)]

B. $\left[Fe(CN)_6\right]^{3-}$

C. $\left[Fe\left(C_2O_4\right)_3\right]^{3-}$

D. $\left[Fe\left(H_2O\right)_6\right]^{3+}$

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919. Which type of complexes do not show geometrical isomerism ?

A. $\left[Cr\left(H_2O\right)_4Cl_2\right]^{+}$

B. $\left[Pt\left(NH_3\right)_3Cl\right]$

C. $\left[Co\left(NH_3\right)_6\right]^{3+}$

D. $\left[Co(CN)_5(NC)\right]^{3-}$

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920. The value of $\left(\frac{1}{2}\right)^{-5}$ will be :

A. $18,000 cm^{-1}$

B. $16,000 cm^{-1}$

C. $8,000 cm^{-1}$

D. $20,000 cm^{-1}$

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921. Draw the geometrical isomers of the following complex : $\left[Fe\left(NH_3\right)_2(CN)_4\right]^-$

A. linkage isomers

B. coordination isomers

C. ionisation isomers

D. geometrical isomers

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922. The compounds $\left[Co(CN)\left(NH_3\right)_5\right]Cl_2$ and $\left[Co(NC)\left(NH_3\right)_5\right]Cl_2$ are examples of

A. linkage isomerism

B. ionisation isomerism

C. coordination isomerism

D. no isomerism

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923. A chelating agent has two or more than two donor atoms to bind to a single metal ion. Which of the following is not a chelating agent?

A. thiosulphato

B. oxalato

C. glycinato

D. ethane-1,2-diamine

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924. Which of the following ligands is expected to be bidentate?

A. NO

B. NH_4^+

C. $NH_2CH_2CH_2NH$

D. CO

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925. Namethe type of isomerism exhibited bythe following pair of isomers. $\left[Cr\left(H_2O\right)_6\right]Cl_3$ and $\left[Cr\left(H_2O\right)_5Cl\right]Cl_2.H_2O$

A. linkage isomerism

B. solvate isomerism

C. ionisation isomerism

D. coordination isomerism

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926. IUPAC name of $\left[Pt\left(NH_3\right)_2Cl\left(NO_2\right)\right]$ is :

A. Platinum diaminechloronitrite

B. Chloronitrito-N-ammineplatinum (II)

C. Diamminechloridonitrito-N-platinum (II)

D. Diamminechloronitrito-N-platinate (II)

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927. In the following questions two or more options may be correct. Atomic number of Mn, Fe and Co are 25, 26 and 27 respectively. Which of the following inner orbital octahedral complex ions are diamagnetic ?

A. $\left[Co\left(NH_3\right)_6\right]^{3+}$

B. $\left[Mn(CN)_6\right]^{3-}$

C. $\left[Fe(CN)_6\right]^{4-}$

D. $\left[Fe(CN)_6\right]^{3-}$

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928. Is the iupac name of compound is correct ? $\left[Co\left(H_2O\right)_5CO_3\right]Cl$ pentawatercarbonatocobalt(III)chloride

A.

B.

C.

D.

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929. Is the iupac name of compound is correct ? $K_3\left[Fe(SCN)_5NO\right]$

Potassium pentacyanidonitroferrate(II)

A.

B.

C.

D.

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930. An aqueous pink solution of cobalt (II) chloride changes to deep blue on addition of excess of HCI. This is because___.

A. $\left[Co\left(H_2O\right)_6\right]^{2+}$ is transformed into $\left[CoCl_6\right]^{4-}$

B. $\left[Co\left(H_2O\right)_6\right]^{2+}$ is transformed into $\left[CoCl_6\right]^{2-}$

C. tetrahedral complexes have smaller crystal field splitting than octahedral complexes.

D. tetrahedral complexes have larger crystal field splitting than octahedral complex.

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931. Which of the following complexes are homoleptic ?

A. $\left[Co\left(NH_3\right)_6\right]^{3+}$

B. $\left[Co\left(NH_3\right)_4Cl_2\right]^{+}$

C. $\left[Ni(CN)_4\right]^{2-}$

D. $\left[Ni\left(NH_3\right)_4Cl_2\right]$

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932. Which of the following complexes are heteroleptic ?

A. $\left[Cr\left(NH_3\right)_6\right]^{3+}$

B. $\left[Fe\left(NH_3\right)_4Cl_2\right]^{+}$

C. $\left[Mn(CN)_6\right]^{4-}$

D. $\left[Co\left(NH_3\right)_4Cl_2\right]$

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933. Identify the optically active compounds from the following :

A. $\left[Co(en)_3\right]^{3+}$

B. *trans* - $\left[Co(en)_2Cl_2\right]^{+}$

C. *cis* - $\left[Co(en)_2Cl_2\right]^{+}$

D. $\left[Cr\left(NH_3\right)_5Cl\right]$

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934. Is the iupac name of compound is correct ? $K_3\left[Al(ox)_3\right]$

Potassium trisoxalatoaluminate(III)

A.

B.

C.

D.

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935. Is the iupac name of compound is correct ?

$\left[CoNO_2\left(NH_3\right)_5\right]SO_4$ pentaamminenitrito-O-cobalt(III)sulphate

A.

B.

C.

D.

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936. Is the iupac name of compound is correct ? $\left[Co(en)_3\right]_2\left(SO_4\right)_3$

trisethylenediaminecobalt(III)sulphate

A.

B.

C.

D.

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937. Match the coordination compounds given in Column I with the central metal atoms given in Column II and assign the correct code :

Column I (Coordination Compound)	Column II (Central metal atom)
A. Chlorophyll	1. rhodium
B. Blood pigment	2. cobalt
C. Wilkinson catalyst	3. calcium
D. Vitamin B_{12}	4. iron
	5. magnesium

A.

(a) A (5) B (4) C (1) D (2)

B.

(b) A (3) B (4) C (5) D (1)

C.

(c) A (4) B (3) C (2) D (1)

D.

(d) A (3) B (4) C (1) D (2)

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938. Match the complex ions given in Column I with the hybridisation and number of unpaired electrons given in Column II and assign the correct code :

Column I (Complex ion)	Column II (Hybridisation, number of unpaired electrons)
A. $[Cr(H_2O)_6]^{3+}$	1. dsp^2, 1
B. $[Co(CN)_4]^{2-}$	2. sp^3d^2, 5
C. $[Ni(NH_3)_6]^{2+}$	3. d^2sp^3, 3
D. $[MnF_6]^{4-}$	4. sp^3, 4
	5. sp^3d^2, 2

A. A(3) B (1) C (5) D (2)

B. A(4) B(3) C(2) D (1)

C. A(3) B (2) C (4) D(1)

D. A(4) B (1) C (2) D (3)

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939. Match the complex species given in Column I with the possible isomerism given in Column II and assign the correct code :

Column I (Complex species)	Column II (Isomerism)
A. $[Co(NH_3)_4Cl_2]^+$	1. optical
B. *cis*-$[Co(en)_2Cl_2]^+$	2. ionisation
C. $[Co(NH_3)_5(NO_2)]Cl_2$	3. coordination
D. $[Co(NH_3)_6][Cr(CN)_6]$	4. geometrical
	5. linkage

A. A(1) B (2) C (4) D (5)

B. A (4) B (3) C (2) D (1)

C. A(4) B (1) C (5) D (3)

D. A(4) B (1) C (2) D (3)

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940. Match the compounds given in Column I with the oxidation state of cobalt present in it (given in Column II) and assign the correct code.

Column I (Compound) of Co)	Column II (Oxidation state
A. $[Co(NCS)(NH_3)_5](SO_3)$	1. + 4
B. $[Co(NH_3)_4Cl_2]SO_4$	2. 0
C. $Na_4[Co(S_2O_3)_3]$	3. + 1
D. $[Co_2(CO)_8]$	4. + 2
	5. + 3

A. A(1) B (2) C (4) D (5)

B. A(4) B(3) C(2) D (1)

C. A (5) B(1) C (4) D (2)

D. A(4) B(1) C (2) D (3)

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941. Name the type of isomerism exhibited by the following pair of isomers : $\left[Co\left(NH_3\right)_5Br\right]SO_4$ and $\left[Co\left(NH_3\right)_5SO_4\right]Br$

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942. Write the number of unpaired electron in given compound : $\left[Cr\left(H_2O\right)_6\right]Cl_2$

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943. Assertion : Linkage isomerism arises in coordination compounds containing ambidentate ligand. Reason : Ambidentate ligand has two different don atoms.

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944. Assertion : Complexes of MX_6 and MX_5L type (X and L are unidentate) do not show geometrical isomerism. Reason : Geometrical isomerism is not shown be complexes of coordin-ation number 6.

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945. Assertion : $\left(\left[Fe(CN)_6\right]^{3-}\right.$ ion shows magnetic moment corresponding to two unpaired electrons. Reason : Because it has d^2sp^3 type hybridisation

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946. Give one example of linkage isomer.

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947. Why does NH_3 readily form complexes but NH_4^+ does not ?

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948. Give evidence that [CO(NH3)5Cl]S04 and [CO(NH3)5(S04)]Cl are ionisation isomers.

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949. Name central metal atom present in haemoglobin and Vitamin B_{12}.

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950. Name one example of a hexadentate ligand.

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951. Write the IUPAC name of the following :

$K_3\left[Fe(CN)_5NO\right]$

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952. Write the IUPAC name of the compound $\left[Cr(NCS)\left(NH_3\right)_5\right]\left[ZnCl_4\right]$.

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953. Draw the structures of optical isomers of: $\left[Cr\left(C_2O_4\right)_3\right]^3$ -

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954. Draw the structures of optical isomers of : $Cr\left(NH_3\right)_2Cl_2(en)]^+$

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955. The hexaquo manganese(II) ion contains five unpaired electrons, while the hexacyanoion contains only one unpaired electron. Explain using Crystal Field Theory.

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956. What is meant by stability of a coordination compound in solution? State the factors which govern

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957. Explain non-ionic nature of $CoCl_3.3NH_3$ on the basis of Werner's coordination theory.

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958. Write the shape and magnetic behaviour of the following complex : $\left[Ni(CN)_4\right]^{2-}$

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959. On the basis of valence bond theory, explain the shape and magnetic behaviour of the following coordination compound : $\left[Ni(CO)_4\right]$

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960. Write the shape and magnetic behaviour of the following complex : $\left[Co\left(NH_3\right)_6\right]^{3+}$

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961. One mole of complex compound $Co\left(NH_3\right)_5Cl_3$ give 3 moles of a ions on dissolution in water. One mole of the same complex reacts with two moles of $AgNO_3$ solution to yield two moles of AgCl(s). The structure of the complex is

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962. Why is geometrical isomerism not possible in tetrahedral compounds having two different types of unidentate ligands with the central metal ion ?

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963. Explain the following : Most of the tetrahedral complexes are high spin complexes.

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964. Define chelate and chelating ligand. Give one example of chelate complex.

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965. Name the type of isomerism exhibited by the following pair of isomers : $\left[Co\left(NH_3\right)_4Cl_2\right]NO_2$ and $\left[Co\left(NH_3\right)_4Cl\left(NO_2\right)\right]Cl$

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966. Discuss the nature of bonding in metal carbonyls.

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967. $\left[Fe(CN)_6\right)]^{4-}$ and $\left[Fe\left(H_2O\right)_6\right)]^{2+}$ are of different colours in dilute solutions. Why ?

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968. What is spectrochemical series?

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969. Express 2321 in roman numbers.

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970. What do you understand by weak field and strong field ligands? With the help of crystal field theory calculate the number of unpaired

electrons in octahedral complexes of Fe^{3+} in the presence of weak field ligand.

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971. What do you understand by weak field and strong field ligands? With the help of crystal field theory calculate the number of unpaired electrons in octahedral complexes of Fe^{3+} in the presence of strong field ligand.

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