CHEMISTRY

BOOKS - MODERN PUBLICATION

d-AND f- BLOCK ELEMENTS

EXAMPLE

1. Write the electronic configurations of the following ions :

$Cu^{2}+$

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2. Write the electronic configurations of the following ions : Co^{3+}

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3. Write the electronic configurations of the following ions : Cr^{2+}

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4. Write the electronic configurations of the following ions : Mn^{3+}

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5. Calculate the magnetic moment of a divalent ion in aqueous solution if its atomic number is 25.

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6. Which is stronger reducing agent Cr^{2+} or Fe^{2+} and why ?

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7. Why Cr^{2+} is strongly reducing while Mn^{3+} is strongly oxidising ?

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8. Scandium (z = 21) is a transition element but zinc (z = 30) is not. Explain.

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9. Express 1275 in roman numbers.

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10. Why do transition metals have high enthalpies of atomization ?

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11. What is meant by 'disproportionation' of an oxidation state ? Give an example.

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12. Out of ions Co^{2+},Cr^(3+), (Sc^{3+} which will give coloured aqueous solution and what will be the magnetic behaviour of each ion ? (Atomic number of Co = 27, Sc = 21 and Cr = 24).

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

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14. The $E^{\circ}_{M^{2+}/M}$ for copper is positive (0.34 V). Copper is the only metal in the first series of transition elements showing this behaviour.

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15. Copper is regarded as transition metal though it has completely filled d-orbitals $\left(d^{10}\right)$. Expalin.

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16. Why Zn^{2+} salts are colourless and Ni2+ salts are coloured?

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17. Out of the ions Ag^{+}, Co^{2+} and Ti^{4+} which will give coloured aqueous solution and what will be the magnetic behaviour of each ion ? (Atomic number of Ag = 47, Co = 27 and Ti = 22).

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18. When is the magnetic flux linked with a coil held in a magnetic field zero?

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19. Which of the 3d-series of transition elements exhibits the largestn number of oxidation states and why ?

A. Zr

B. Ti

C. V

D. Mn.

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20. Out of cobalt and zinc Salts, which is attracted in a magnetic field. Explain with reasons.

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21. The bivalent metal ion having maximum paramagnetic behaviour is

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22. Which out of the following ions would form coloured complexes : Ni^{2+}, Cu^{+} ?

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23. Why are I.E. of 5d - elements greater than 3d- elements ?

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24. K_2PtCl_6 is known but Ni compound is not known. State a reason for it.

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25. The standard reduction potentials of Co^{2+} and Co^{3+} are -0.28 V and 1.8 V respectively. Which should be a better oxidising agent in water : Co^{2+} or Co^{3+} ?

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26. Express 1276 in roman numbers.

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27. Express 1277 in roman numbers.

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28. Which of the two Ferrous or Ferric ion has larger magnetic moment and why ?

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29. Which metal in the first series of transition metals exhibits +1 oxidation state most frequently and why?

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30. The bivalent metal ion having maximum paramagnetic behaviour is

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31. Express 1278 in roman numbers.

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32. Express 1280 in roman numbers.

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33. The melting and boiling points of Zn, Cd and Hg are low.Why ?

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34. What may be the stable oxidation state of the transition element with the following d-electron configuration in the

group state of their atoms ? $3d^3$, $3d^5$, $3d^8$, $3d^4$

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35. Name a transition element which does not exhibit variable oxidation states.

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36. Express 1281 in roman numbers.

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37. How would you account for the increasing oxidising power in the series $VO_2^+ < Cr_2O_7^{2-} < MnO_4^-$?

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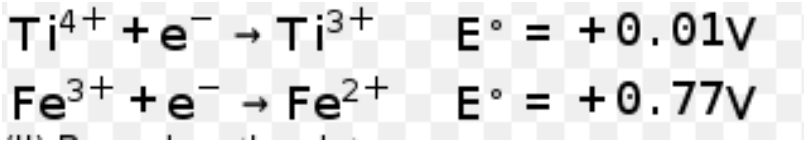
38. On the basis of the standard electrode potential values states for acid solution, predict whether Ti^{4+} species may be used to oxidise Fe^{2+} to Fe^{3+}.



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39. Chromium is a typical hard metal while Mercury is liquid. Explain.

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40. Scandium (z = 21) is a transition element but zinc (z = 30) is not. Explain.

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41. Which of the following has maximum number of unpaired electrons ? $Ti^{3+}, V^{3+}, Fe^{2+}, Mn^{2+}$

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42. Using the given data ,find the strongest reducing agent

$E^{\circ} Cr^{6+} / Cr^{3+} = 1.33V, E^{\circ} Cl_2 / Cl^{-} = 1.36V$

$E^{\circ} Mn^{7+} / Mn^{2+} = 1.51V, E^{\circ} Cr^{3+} / Cr = -0.74V.$

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43. In 3d-series,manganese shows maximum number of oxidation states.

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44. Write the name of metal which shows only +3 oxidation state.

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45. Express 1282 in roman numbers.

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46. Express 1283 in roman numbers.

Watch Video Solution

47. Express 1285 in roman numbers.

Watch Video Solution

48. Express 1286 in roman numbers.

Watch Video Solution

49. Express 1287 in roman numbers.

Watch Video Solution

50. Express 1288 in roman numbers.

Watch Video Solution

51. Express 1300 in roman numbers.

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52. Complete the following chemical equation :

$MnO_4^-(aq) + H_2O_2(aq) + H^+(aq) \rightarrow$

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53. Express 1301 in roman numbers.

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54. Express 1302 in roman numbers.

Watch Video Solution

55. Express 1303 in roman numbers.

Watch Video Solution

56. Express 1305 in roman numbers.

Watch Video Solution

57. Express 1306 in roman numbers.

Watch Video Solution

58. Express 1307 in roman numbers.

Watch Video Solution

59. Express 1308 in roman numbers.

Watch Video Solution

60. Express 1310 in roman numbers.

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61. Write chemical equations for the following reactions: Oxidation of nitrite ion by MnO_4^- in acidic medium.

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62. Express 1311 in roman numbers.

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63. Write chemical equations for the following reactions: Disproportionation of manganese (VI) in acidic solution.

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64. (a) Write a metal oxide compound for manganese in each of the following oxidation states: +2, +3, +4, +6, +7.

(b) List these metal oxides in the decreasing acidic character.

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65. Complete the following statement- Calcium is required for the body because-

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66. How many water molecules are involved in coordination in $CuSO_4.5H_2O$?

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67. Why is $KMnO_4$ solution used to clean surgical instruments in hospitals ?

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68. In moist air, copper corrodes to produce a green layer on its surface. Explain.

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69. What is the most common form of chromium in basic solution ? What ion forms when a basic solution of chromium is acidified ?

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70. Explain how the colour of a solution of $K_2Cr_2O_7$ depends on the pH of the solution ?

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71. Name the oxometal anions of the first series of the transition metals in which the metal exhibits the oxidation state equal to its group number.

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72. Complete the following reaction equation :

$Cr_2O_7^{2-} + Sn^{2+} + H^+ \rightarrow$

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73. Complete the following reaction equation :

$MnO_4^- + Fe^{2+} + H^+ \rightarrow$

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74. What happens when potassium dichromate is heated with sodium chloride and conc. H_2SO_4 ?

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75. CrO_3 is an acid anhydride. Explain.

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76. Complete the following chemical equation : $KMnO_4 \xrightarrow{513K}$

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77. Complete the following chemical equation : $MnO_2 + KOH + O_2 \rightarrow$

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78. Complete the following chemical reaction equations .

$Cr_2O_7^{2-}(aq) + Fe^{2+}(aq) + H^+(aq) \rightarrow$

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79. Complete the following chemical equation :

$2CrO_4^{2-} + 2H^+ \rightarrow$

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80. Complete the following chemical equation :

$MnO_4^-(aq) + H_2O_2(aq) + H^+(aq) \rightarrow$

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81. Write down the electronic configuration of the following ion: $Pm^{3+}(Z=61)$

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82. Among lanthanoids, Ln (III) compounds are predominant. However, occasionally in solutions on in solid compounds, + 2 and +4 ions are also obtained.

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83. Actinoid contraction is greater from element to element than lanthanoid contraction. Why?

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84. Use Hund's rule to derive the electronic configuration of Ce3+ ion, and calculate its magnetic moment on the basis of 'spin-only' formula.

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85. Which is the last element in the series of the actinoids? Write the electronic configuration of this element. Comment on the possible oxidation state of this element.

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86. Why the actinoids exhibit a large number of oxidation states than the corresponding lanthanoids ?

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87. Why is $La(OH)_3$ more basic than $Lu(OH)_3$?

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88. In the transition series starting from Lanthanum (atom no =57), the next element hafmnium (atom no =72) why so observe this jump in atomic number ?

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89. One among the lanthanoids, Ce(III) (Z=58) can easily be oxidised to Ce (IV). Explain why?

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90. Why Zr and Hf exhibit similar properties ?

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91. What are different oxidation states exhibited by lanthanoids ?

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92. What is the number of unpaired electrons in Nd (Z=60)

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93. Which ion has maximum size in Lanthanoid series ?

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94. Write the number of unpaired electrons in Tm^{2+}

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95. Can lanthanum ion (Z = 57) exist in +4 oxidation state ? Justify your answer.

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96. Chemistry of all lanthanoids is so identical. Explain.

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97. Name an important alloy which contains some of the lanthanoid metals.

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98. Sliver atom has completely filled d-orbitals $\left(4d^{10}\right)$ in its ground state. How can you say that it is a transition element ?

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99. In the series Sc (Z = 21) to Zn (Z = 30), the enthalpy of atomisation of zinc is the lowest, i.e., $126kJmoI^{-1}$. Why?

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100. Which of the 3d-series of transition elements exhibits the largestn number of oxidation states and why ?

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101. The $E^{\circ}\left(M^{2} \frac{+}{M}\right)$ value for copper is positive (+0.34 V). What is the possible reason for this ?

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102. How would you account for the irregular variation of ionisation enthalpies (first and second) in the first series of the transition elements?

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103. Why is the highest oxidation state of a metal exhibited in its oxide or fluoride only ?

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104. Which is stronger reducing agent Cr^{2+} or Fe^{2+} and why ?

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105. Calculate the 'spin only' magnetic moment of M^{2+} ion (Z=27).

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106. Out of Co^{2+}, Zn^{2+} and `Cu^+(2+) which will give aqueous coloured solution ?

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107. Actinoid contraction is greater from element to element than lanthanoid contraction. Why?

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108. Write down the electronic configurations of : Yb^{2+}

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109. Write down the electronic configurations of : No^{3+}

Watch Video Solution

110. Write down the electronic configurations of : Sm^{2+}

Watch Video Solution

111. Write down the electronic configuration of: Mn^{2+}

Watch Video Solution

112. Write down the electronic configuration of Pm^{3+}

Watch Video Solution

113. Write down the electronic configuration of: Ce^{4+}

Watch Video Solution

114. Write down the electronic configuration of: Lu^{2+}

Watch Video Solution

115. Write down the electronic configuration of: Th^{4+}

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

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117. Explain briefly how +2 state becomes more and more stable in the first half of the first row transition elements with increasing atomic number?

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118. To what extent do the electronic configurations decide the stability of oxidation states in the first series of the transition elements? Illustrate your answer with examples.

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119. What may be the stable oxidation state of the transition element with the following d-electron configuration in the group state of their atoms ? $3d^3$, $3d^5$, $3d^8$, $3d^4$

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120. Name the oxometal anions of the first series of the transition metals in which the metal exhibits the oxidation state equal to its group number.

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121. What is Lanthanide contraction ? What is the cause and consequences of Lanthanide contraction ?

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122. What are transition elements ? Which of the d block elements are not regarded as transition elements and why ?

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123. In what way is the electronic configuration of transition elements different from that of the non-transition elements ?

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124. What are different oxidation states exhibited by lanthanoids ?

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125. Explain, why transition metal ions usually show paramagnetic behaviour ?

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126. Why enthalpy of atomisation of the transition elements are quite high ?

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127. Transition metals form mostly coloured compounds.Explain.

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128. Transition elements and their compounds are found to be good catalysts. Give examples.

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129. What are interstitial compounds ? Why are such compounds well known for transition metals.

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130. How is the variability in oxidation states of transition metals different from that of the non transition metals? Illustrate with examples.

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131. Describe the preparation of potassium dichromate from iron chromite ore. What is the effect of increasing pH on a solution of potassium dichromate?

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132. Describe the oxidising action of potassium dichromate and write the ionic equations for its reaction with: H_2S

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133. Describe the preparation of potassium permanganate. How does the acidified permanganate solution react with (i) iron(II) ions Write the ionic equations for the reactions

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134. Complete the following statement- The mineral which is needed for strengthening of bones and teeth

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135. Use the data to comment upon: the ease with which iron can be oxidised as compared to a similar process for either chromium or manganese metal.

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136. Predict which of the following will be coloured in aqueous solution? Ti^{3+}, V^{3+}, Cu^{+}, Sc^{3+}, Mn^{2+}, Fe^{3+} and Co^{2+}. Give reasons for each.

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137. To what extent do the electronic configurations decide the stability of oxidation states in the first series of the transition elements? Illustrate your answer with examples.

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138. Compare the chemistry of actinides with that of the lanthanoids with special reference to electronic Configuration.

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139. Compare the chemistry of actinides with that of Lanthanides with special reference to oxidation state

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140. Compare the chemistry of actinides with that of the lanthanides with special reference to

atomic and ionic sizes.

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141. Compare the chemistry of actinides with that of the lanthanides with special reference to chemical reactivity.

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142. Why Cr^{2+} is strongly reducing while Mn^{3+} is strongly oxidising ?

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143. How would you account for the following: Cobalt(II) is stable in aqueous solution but in the presence of complexing reagents it is easily oxidised.

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144. How would you account for the following: The d1 configuration is very unstable in ions.

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145. What is meant by 'disproportionation'? Give two examples of disproportionation reaction in aqueous solution.

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146. Which metal in the first series of transition metals exhibits +1 oxidation state most frequently and why?

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147. Calculate the number of unpaired electrons in the following gaseous ions: Mn^{3+}, Cr^{3+}, V^{3+} and Ti^{3+}. Which one of these is the most stable in aqueous solution?

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148. Give examples and suggest reasons for the following features of the transition metal chemistry: The lowest oxide of transition metal is basic, the highest is amphoteric/acidic.

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149. Give examples and suggest reasons for the following features of the transition metal chemistiy: The highest oxidation state is exhibited in oxoanions of a metal.

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150. Give examples and suggest reasons for the following features of the transition metal chemistiy: The highest oxidation state is exhibited in oxoanions of a metal.

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151. Write chemical reaction for preparation of K2Cr207 from chromite ore.

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152. Write the preparatopm of $KMnO_4$ from pyrolusite ore.

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153. What are alloys? Name an important alloy which contains some of the lanthanoid metals. Mention its uses.

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154. What are inner transition elements? Decide which of the following atomic numbers are the atomic numbers of the inner transition elements : 29, 59, 74, 95, 102, 104.

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155. The chemistry of the actinoid elements is not so smooth as that of the lanthanoids. Justify this statement by giving some examples from the oxidation state of these elements.

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156. Which is the last element in the series of the actinoids? Write the electronic configuration of this element. Comment on the possible oxidation state of this element.

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157. Use Hund's rule to derive the electronic configuration of Ce3+ ion, and calculate its magnetic moment on the basis of 'spin-only' formula.

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158. Name the members of the lanthanoid series which exhibit +4 oxidation and those which exhibit +2 oxidation states. This type of behaviour with electronic configuration of these elements ?

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159. Compare the chemistry of actinides with that of the lanthanoids with special reference to electronic Configuration.

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160. Compare the chemistry of actinides with that of Lanthanides with special reference to oxidation state

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161. Compare the chemistry of actinides with that of the lanthanides with special reference to chemical reactivity.

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162. Write the electronic configurations of the elements with the atomic numbers 61, 91, 101, and 109.

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163. Compare the general characteristics of the first series of the transition metals with those of the second and third series metals in the respective vertical columns. Give special emphasis on the following points: electronic configurations

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164. Compare the general characteristics of the first series of the transition metals with those of the second and third series metals in the respective vertical columns. Give special emphasis on the following points: oxidation states

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165. Compare the general characteristics of the first series of the transition metals with those of the second and third series metals in the respective vertical columns. Give special emphasis on the following points: ionisation enthalpies

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166. Compare the general characteristics of the first series of the transition metals with those of the second and third series metals in the respective vertical columns. Give special emphasis on the following points: ionisation enthalpies

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167. Write down the number of 3d electrons in each of the following ions: Tiz+, V2+, Cr3+, Mn2*, Fe2+, Fe3+, Co2+, Ni2+ and Cu2+. Indicate how would you expect the five 3d orbitals to be occupied for these hydrated ions (octahedral).

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168. Comment on the statement that elements of the first transition series possess many properties different from those of heavier transition elements.

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169. Complete the following statement- Carbohydrates are-

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170. Cu does not replace hydrogen from acids. It is because

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171. Why E^{Θ} values for Mn, Ni and Zn are more negative than expected ?

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172. Why first ionisation enthalpy of Cr is lower than that of Zn ?

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173. The transition elements have high melting points.

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174. When Cu^{2+} ion is treated with KI, a white precipitate is formed. Explain the reaction with the help of chemical equation.

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175. Out of Cu_2Cl_2 and $CuCl_2$ which is more stable and why ?

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176. When a brown compound of manganese (A) is treated with HCl it gives a gas (B). The gas taken in excess, reacts with NH_3 , to give an explosive compound (C). Identify compounds A, B and C.

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177. Although fluorine is much more electronegative than hydrogen yet the dipole moment of NF3(0.24D) is much lower than that of NH3(1.46D). Explain.

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178. Find the magnetic moment of Cr^{2+}

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179. Ionisation energy of 5d-elements is more than 3d- and 4d-elements. Why ?

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180. Although Zr belongs to 4d and Hf belongs to 5d transition series but it is quite difficult to separate them. Why ?

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181. What is the most common oxidation state in the Lanthanoids ?

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182. How does $KMnO_4$ act as a powerful oxidizing agent in neutral, alkaline or acidic medium ?

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183. When orange solution containing $Cr_2O_7^{2-}$ ion is treated with an alkali, a yellow solution is formed and when H^+ ions are added to yellow solution, an orange solution is obtained. Explain why does this happen ?

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184. Explain how the colour of a solution of $K_2Cr_2O_7$ depends on the pH of the solution ?

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185. The second and third members in a group of transition metals have similar atomic radii. Why ?

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186. E^{Θ} of $Cu$is $+0.34V$while that of $Zn$is $-0.76V$. Explain.

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187. Which of the 3d-series of transition elements exhibits the largestn number of oxidation states and why ?

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188. While filling up of electrons in the atomic orbitals, the 4s orbital is filled before the 3d orbital but reverse happens during the ionisation of the atom. Explain why?

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189. In what way is the electronic configuration of transition elements different from that of the non-transition elements ?

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190. Express 1323 in roman numbers.

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191. How would you account for the irregular variation of ionisation enthalpies (first and second) in the first series of the transition elements?

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192. The first ionisation enthalpy of nitrogen is higher than that of oxygen but the second ionisation enthalpy is higher in oxygen than that of nitrogen. Explain

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193. Explain why Cu(I) is diamagnetic while Cu(II) is paramagnetic.

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194. Express 1327 in roman numbers.

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195. Write the chemical formula of hydrated copper sulphate and anhydrous copper sulphate. Give an activity to illustrate how these two are interconvertible

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196. Express 1326 in roman numbers.

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197. A mixed oxide of iron and chromium, $FeO.Cr_2O_3$ is fused with sodium carbonate in the presence of air to form a yellow compound (A). On acidification, the compound (A) forms an orange coloured compound (B) which is a strong oxidising agent. Identify the compounds (A) and (B) .

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198. A mixed oxide of iron and chromium, $FeO.Cr_2O_3$ is fused with sodium carbonate in the presence of air to form a yellow compound (A). On acidification, the compound (A) forms an orange coloured compound (B) which is a strong oxidising agent. Identify write balanced chemical equations for each step.

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199. Express 1328 in roman numbers.

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200. Express 1330 in roman numbers.

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201. Express 1331 in roman numbers.

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202. In the transition series starting from Lanthanum (atom no =57), the next element hafmnium (atom no =72) why so observe this jump in atomic number ?

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203. Express 1332 in roman numbers.

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204. Which of the two Na^+ or Ag^+ is stronger Lewis acid and why ?

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205. Express 1333 in roman numbers.

Watch Video Solution

206. Express 1336 in roman numbers.

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207. Express 1335 in roman numbers.

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208. Write equations for the reaction of silver bromide with hypo in photographic process.

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209. Express 1338 in roman numbers.

Watch Video Solution

210. Express 1337 in roman numbers.

Watch Video Solution

211. Express 1350 in roman numbers.

Watch Video Solution

212. Express 1351 in roman numbers.

Watch Video Solution

213. Express 1352 in roman numbers.

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Watch Video Solution

214. Write the electronic configurations of the following ions :

$Cu^{2}+$

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215. Write the electronic configurations of the following ions :

Co^{2+}

Watch Video Solution

216. Express 2063 in roman numbers.

Watch Video Solution

217. Write the electronic configurations of the following ions :

Mn^{2+}

Watch Video Solution

218. Express 2065 in roman numbers.

Watch Video Solution

219. Express 2066 in roman numbers.

Watch Video Solution

220. Express 2067 in roman numbers.

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221. Express 2068 in roman numbers.

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222. For the first row transition metals, the E^{Θ} values are :

$E^{\ominus}$	V	Cr	Mn	Fe	Co	Ni	Cu
$(M^{2+}M)$	-1.18	-0.91	-1.18	-0.44	-0.28	-0.25	+0.34

Expalin the irregularity in the above values .

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223. Why do transition metals have high enthalpies of atomization ?

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224. What is meant by 'disproportionation' of an oxidation state ? Give an example.

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225. Express 2070 in roman numbers.

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226. Express 2071 in roman numbers.

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227. The $E^{\circ}_{M^{2+}/M}$ for copper is positive (0.34 V). Copper is the only metal in the first series of transition elements showing

this behaviour.

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228. Copper is regarded as transition metal though it has completely filled d-orbitals $\left(d^{10}\right)$. Expalin.

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229. Ions of Zn^{2+} and Ti^{4+} are colourless while Cu^{2+} and Ni^{2+} are coloured . Why ?

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230. Out of the ions Ag^{+}, Co^{2+} and Ti^{4+} which will give coloured aqueous solution and what will be the magnetic

behaviour of each ion ? (Atomic number of Ag = 47, Co = 27 and Ti = 22).

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231. Write the iupac name of following : $Ca_2\left[Fe(CN)_6\right]$

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232. Which of the following exhibits the greatest number of oxidation states?

A. Zr

B. Ti

C. V

D. Mn.

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233. Express 2076 in roman numbers.

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234. The bivalent metal ion having maximum paramagnetic behaviour is

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235. Giving reasons indicate which one of the following would be coloured ? Cu^+, VO^{2+}, Sc^{3+}, Ni^{2+} (At. no. of Cu = 29, V = 23, Sc = 21, Ni = 28)

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236. Why are I.E. of 5d - elements greater than 3d- elements ?

Watch Video Solution

237. K_2PtCl_6 is known but Ni compound is not known. State a reason for it.

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238. The standard reduction potentials of Co^{2+} and Co^{3+} are -0.28 V and 1.8 V respectively. Which should be a better oxidising agent in water : Co^{2+} or Co^{3+} ?

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239. The sums of first and second jonization enthalpies and those of third and fourth ionization enthalpies of nickel and platinum are :

	$IE_1 + IE_2$ (MJ mol^{-1})	$IE_3 + IE_4$ (MJ mol^{-1})
Ni	2.49	8.80
Pt	2.66	6.70

Based on this information, write: The most common oxidation state for Ni and Pt and mention why they are common.

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240. Express 2077 in roman numbers.

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241. Express 2078 in roman numbers.

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242. Express 2080 in roman numbers.

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243. Express 2081 in roman numbers.

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244. What happens when Fe, Al, Ni, Co combine together?

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245. Name the following : Two ions of first transition series having zero magnetic moment.

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246. The melting and boiling points of Zn, Cd and Hg are low.Why ?

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247. Explain what happens when 68% of lead combines with 32% of tin?

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248. Explain what happens when Ni, Fe, Cr, Mn combine together?

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249. Fe^{3+} is more stable than Fe^{2+} . Explain.

Watch Video Solution

250. What happens when 10% of aluminium and 90% of copper combine together?

Watch Video Solution

251. On the basis of the standard electrode potential values states for acid solution, predict whether Ti^{4+} species may be used to oxidise Fe^{2+} to Fe^{3+}.

$$Ti^{4+} + e^- \rightarrow Ti^{3+} \quad E^\circ = +0.01V$$
$$Fe^{3+} + e^- \rightarrow Fe^{2+} \quad E^\circ = +0.77V$$

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252. Chromium is a typical hard metal while Mercury is liquid. Explain.

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253. Silver is a transition metal but zinc is not.

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254. Which of the following has maximum number of unpaired electrons ? Ti^{3+}, V^{3+}, Fe^{2+}, Mn^{2+}

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255. Based on the data, arrange Fe^{2+}, Mn^{2+} and Cr^{2+} in the increasing order of stability of +2 oxidation state: $E^0_{Cr^{3+}/Cr^{2+}} = -0.4V$, $E^0_{Mn^{3+}/Mn^{2+}} = 1.5V$, $E^0_{Fe^{3+}/Fe^{2+}} = 0.8V$

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256. Name the element showing maximum number of oxidation states among the first series of transition metals from Sc(Z = 21) to Zn (Z = 30).

Watch Video Solution

257. What happens when 95% of aluminium, 0.5% of magnesium , 0.5% of manganese and 4% of copper combine together?.

Watch Video Solution

258. Complete the following chemical equation : $Cr_2O_7^{2-} + H^+ + I^- \rightarrow$

Watch Video Solution

259. Complete the following chemical equation : $MnO_4^- + NO_2^- + H^+ \rightarrow$

Watch Video Solution

Watch Video Solution

260. What happens when Al, Mg, Mn and Cu combine together?

Watch Video Solution

261. Complete the following chemical equation :

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

Watch Video Solution

262. Complete the following chemical equation :

$Cr_2O_7^{2-}(aq) + H_2S(g) + H^+(aq) \rightarrow$

Watch Video Solution

263. Complete the following chemical equation :

$MnO_4^-(aq) + S_2O_3^{2-}(aq) + H_2O(l) \rightarrow$

Watch Video Solution

264. Complete the following chemical equation :

$Cr_2O_7^{2-}(aq) + Fe^{2+}(aq) + H^+(aq) \rightarrow$

Watch Video Solution

265. Complete the following chemical equation :

$MnO_4^-(aq) + H_2O_2(aq) + H^+(aq) \rightarrow$

Watch Video Solution

266. Complete the following chemical equation :

$2CrO_4^{2-} + 2H^+ \rightarrow$

Watch Video Solution

267. Complete the following chemical equation :

$MnO_4^- + H^+ + SO_3^{2-} \rightarrow$

Watch Video Solution

268. Write chemical equation for :Oxidation of Fe^{2+} by $Cr_2O_7^{2-}$ in acidic medium .

Watch Video Solution

269. Write the chemical equation for the oxidation of $S_2O_3^{2-}$ by MnO_4^- in neuntral medium.

Watch Video Solution

270. Write chemical equation for : Oxidation of I^- by MnO_4^- in alkaline medium.

Watch Video Solution

271. Write chemical equation for : Oxidation of SO_3^{2-} by $Cr_2O_7^{2-}$ in acidic medium.

Watch Video Solution

272. What happens when 5% of aluminium combines with 95% of magnesium?

Watch Video Solution

273. What happens when 80% of copper and 20% of zinc combine together?

Watch Video Solution

274. What happens when 50% of copper, 35% of zinc and 15% of nickel combine together?

Watch Video Solution

275. Write chemical equations for the following reactions: Acidification of potassium chromate solution.

Watch Video Solution

276. Write chemical equations for the following reactions: Disproportionation of manganese (VI) in acidic solution.

Watch Video Solution

277. (a) Write a metal oxide compound for manganese in each of the following oxidation states: +2, +3, +4, +6, +7.

(b) List these metal oxides in the decreasing acidic character.

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278. Express 2082 in roman numbers.

Watch Video Solution

279. How many water molecules are involved in coordination in $CuSO_4.5H_2O$?

Watch Video Solution

280. Why is $KMnO_4$ solution used to clean surgical instruments in hospitals ?

Watch Video Solution

281. In moist air, copper corrodes to produce a green layer on its surface. Explain.

Watch Video Solution

282. What is the most common form of chromium in basic solution ? What ion forms when a basic solution of chromium is acidified ?

Watch Video Solution

283. Explain how the colour of a solution of $K_2Cr_2O_7$ depends on the pH of the solution ?

Watch Video Solution

284. Name the oxometal anions of the first series of the transition metals in which the metal exhibits the oxidation state equal to its group number.

Watch Video Solution

285. Complete the following reaction equation :

$Cr_2O_7^{2-} + Sn^{2+} + H^+ \rightarrow$

Watch Video Solution

286. Complete the following reaction equation :

$MnO_4^- + Fe^{2+} + H^+ \rightarrow$

Watch Video Solution

287. What happens when potassium dichromate is heated with sodium chloride and conc. H_2SO_4 ?

Watch Video Solution

288. CrO_3 is an acid anhydride. Explain.

Watch Video Solution

289. Complete the following chemical equation : $KMnO_4 \xrightarrow{513K}$

Watch Video Solution

290. Complete the following chemical equation : $MnO_2 + KOH + O_2 \rightarrow$

Watch Video Solution

291. Complete the following chemical equation :

$Cr_2O_7^{2-}(aq) + Fe^{2+}(aq) + H^+(aq) \rightarrow$

Watch Video Solution

292. Complete the following chemical equation :

$2CrO_4^{2-} + 2H^+ \rightarrow$

Watch Video Solution

293. Complete the following chemical equation :

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

Watch Video Solution

294. Write down the electronic configurations of the following ions:

$Pm^{3+}(Z=61), Ce^{4+}(Z=58), Lu^{2+}(Z=71), Th^{4+}(Z=90)$

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295. Among lanthanoids, Ln (III) compounds are predominant. However, occasionally in solutions on in solid compounds, + 2 and +4 ions are also obtained.

Watch Video Solution

296. Actinoid contraction is greater from element to element than lanthanoid contraction. Why?

Watch Video Solution

297. Use Hund's rule to derive the electronic configuration of Ce^{3+} ion, and calculate its magnetic moment on the basis of 'spin-only' formula.

Watch Video Solution

298. Which is the last element in the series of the actinoids? Write the electronic configuration of this element. Comment on the possible oxidation state of this element.

Watch Video Solution

299. Why the actinoids exhibit a large number of oxidation states than the corresponding lanthanoids ?

Watch Video Solution

300. Why is $La(OH)_3$ more basic than $Lu(OH)_3$?

Watch Video Solution

301. In the transition series starting from Lanthanum (atom no =57), the next element hafmnium (atom no =72) why so observe this jump in atomic number ?

Watch Video Solution

302. One among the lanthanoids, Ce(III) (Z=58) can easily be oxidised to Ce (IV). Explain why?

Watch Video Solution

303. Why Zr and Hf exhibit similar properties ?

Watch Video Solution

304. What are different oxidation states exhibited by lanthanoids ?

Watch Video Solution

305. What is the basic difference between the electronic configurations of transition and inner transition elements ?

Watch Video Solution

306. Which ion has maximum size in Lanthanoid series ?

Watch Video Solution

307. Give one example each of lanthanoid ion having +2, +3 and +4 oxidation states.

Watch Video Solution

308. Can lanthanum ion (Z = 57) exist in +4 oxidation state ? Justify your answer.

Watch Video Solution

309. Chemistry of all lanthanoids is so identical. Explain.

Watch Video Solution

310. Name an important alloy which contains some of the lanthanoid metals.

Watch Video Solution

311. Sliver atom has completely filled d-orbitals $\left(4d^{10}\right)$ in its ground state. How can you say that it is a transition element ?

Watch Video Solution

312. In the series Sc (Z = 21) to Zn (Z = 30), the enthalpy of atomisation of zinc is the lowest, i.e., $126kJmoI^{-1}$. Why?

Watch Video Solution

313. Which of the 3d-series of transition elements exhibits the largestn number of oxidation states and why ?

Watch Video Solution

314. The $E^{\circ}\left(M^{2} \frac{+}{M}\right)$ value for copper is positive (+0.34 V). What is the possible reason for this ?

Watch Video Solution

315. How would you account for the irregular variation of ionisation enthalpies (first and second) in the first series of the transition elements?

Watch Video Solution

316. Why is the highest oxidation state of a metal exhibited in its oxide or fluoride only ?

Watch Video Solution

317. Which is stronger reducing agent Cr^{2+} or Fe^{2+} and why ?

Watch Video Solution

318. Calculate the 'spin only' magnetic moment of M^{2+} ion (Z=27).

Watch Video Solution

319. Explain the following observation : Cu^+ ion is not known in aqueous solutions.

Watch Video Solution

320. Actinoid contraction is greater from element to element than lanthanoid contraction. Why?

Watch Video Solution

321. Write down the electronic configuration of: Cr^{3+}

Watch Video Solution

322. Write down the electronic configuration of Cu^+

Watch Video Solution

323. Write down the electronic configuration of: Co^{2+}

Watch Video Solution

324. Write down the electronic configuration of: Mn^{2+}

Watch Video Solution

325. Write down the electronic configuration of Pm^{3+}

Watch Video Solution

326. Write down the electronic configuration of: Ce^{4+}

Watch Video Solution

327. Write down the electronic configuration of: Lu^{2+}

Watch Video Solution

328. Write down the electronic configuration of: Th^{4+}

Watch Video Solution

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

Watch Video Solution

330. Explain briefly how +2 state becomes more and more stable in the first half of the first row transition elements with increasing atomic number?

Watch Video Solution

331. To what extent do the electronic configurations decide the stability of oxidation states in the first series of the transition elements? Illustrate your answer with examples.

Watch Video Solution

332. What may be the stable oxidation state of the transition element with the following d-electron configuration in the group state of their atoms ? $3d^3$, $3d^5$, $3d^8$, $3d^4$

Watch Video Solution

333. Name the oxometal anions of the first series of the transition metals in which the metal exhibits the oxidation state equal to its group number.

Watch Video Solution

334. What is Lanthanide contraction ? What is the cause and consequences of Lanthanide contraction ?

Watch Video Solution

335. What are transition elements ? Which of the d block elements are not regarded as transition elements and why ?

Watch Video Solution

336. In what way is the electronic configuration of transition elements different from that of the non-transition elements ?

Watch Video Solution

337. What are different oxidation states exhibited by lanthanoids ?

Watch Video Solution

338. Explain, why transition metal ions usually show paramagnetic behaviour ?

Watch Video Solution

339. Why enthalpy of atomisation of the transition elements are quite high ?

Watch Video Solution

340. Transition metals form mostly coloured compounds.Explain.

Watch Video Solution

341. Transition elements and their compounds are found to be good catalysts. Give examples.

Watch Video Solution

342. What are interstitial compounds ? Why are such compounds well known for transition metals.

Watch Video Solution

343. How is the variability in oxidation states of transition metals different from that of the non transition metals? Illustrate with examples.

Watch Video Solution

344. Describe the preparation of potassium dichromate from iron chromite ore. What is the effect of increasing pH on a solution of potassium dichromate?

Watch Video Solution

345. Describe the oxidising action of potassium dichromate and write the ionic equations for its reaction with : (a) iodide (b) iron (II) solution, and (c) H_2S.

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346. Describe the preparation of potassium permanganate. How does the acidified permanganate solution react with (i) iron(II) ions Write the ionic equations for the reactions

Watch Video Solution

347. For M^{2+}/M and M^{3+}/M^{2+} system the E° values for some metals are as folows :

Cr^{2+}/Cr	– 0.9 V	Cr^{3}/Cr^{2+}	– 0.4 V
Mn^{2+}/Mn	– 1.2 V	Mn^{3+}/Mn^{2+}	+ 1.5 V
Fe^{2+}/Fe	– 0.4 V	Fe^{3+}/Fe^{2+}	+ 0.8 V

Use this data to comment upon : the stability of Fe^{3+} in acid solution as compared to that of Cr^{3+} or Mn^{3+}.

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348. For M^{2+}/M and M^{3+}/M^{2+} system the E° values for some metals are as folows :

Cr^{2+}/Cr	– 0.9 V	Cr^{3}/Cr^{2+}	– 0.4 V
Mn^{2+}/Mn	– 1.2 V	Mn^{3+}/Mn^{2+}	+ 1.5 V
Fe^{2+}/Fe	– 0.4 V	Fe^{3+}/Fe^{2+}	+ 0.8 V

Use this data to comment upon : the ease with which iron can be oxidised as compared to the similar process for either chromium or manganese metal.

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349. Predict which of the following will be coloured in aqueous solution? Ti^{3+}, V^{3+}, Cu^{+}, Sc^{3+}, Mn^{2+}, Fe^{3+} and Co^{2+}. Give reasons for each.

Watch Video Solution

350. Compare the stability of +2 oxidation state for the elements of the first transition series .

Watch Video Solution

351. Compare the chemistry of actinides with that of the lanthanoids with special reference to electronic Configuration.

Watch Video Solution

352. Compare the chemistry of actinides with that of Lanthanides with special reference to oxidation state

Watch Video Solution

353. Compare the chemistry of actinides with that of the lanthanides with special reference to atomic and ionic sizes.

Watch Video Solution

354. Compare the chemistry of actinides with that of the lanthanides with special reference to chemical reactivity.

Watch Video Solution

355. How would you account for the following : Of the d^4 species, Cr^{2+} is strongly reducing while Mn(III) is strongly oxidising.

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356. How would you account for the following: Cobalt(II) is stable in aqueous solution but in the presence of complexing reagents it is easily oxidised.

Watch Video Solution

357. How would you account for the following: The d1 configuration is very unstable in ions.

Watch Video Solution

358. What is meant by 'disproportionation'? Give two examples of disproportionation reaction in aqueous solution.

Watch Video Solution

359. Which metal in the first series of transition metals exhibits +1 oxidation state most frequently and why?

Watch Video Solution

360. Calculate the number of unpaired electrons in the following gaseous ions: Mn^{3+}, Cr^{3+}, V^{3+} and Ti^{3+}. Which one of these is the most stable in aqueous solution?

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361. Give examples and suggest reasons for the following features of the transition metal chemistry: The lowest oxide of transition metal is basic, the highest is amphoteric/acidic.

Watch Video Solution

362. Express 2117 in roman numbers.

Watch Video Solution

363. Give examples and suggest reasons for the following features of the transition metal chemistiy: The highest oxidation state is exhibited in oxoanions of a metal.

Watch Video Solution

364. Write chemical reaction for preparation of K2Cr207 from chromite ore.

Watch Video Solution

365. Write the preparatopm of $KMnO_4$ from pyrolusite ore.

Watch Video Solution

366. What are alloys? Name an important alloy which contains some of the lanthanoid metals. Mention its uses.

Watch Video Solution

367. What are inner transition elements? Decide which of the following atomic numbers are the atomic numbers of the inner transition elements : 29, 59, 74, 95, 102, 104.

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368. The chemistry of the actinoid elements is not so smooth as that of the lanthanoids. Justify this statement by giving some examples from the oxidation state of these elements.

Watch Video Solution

369. Which is the last element in the series of the actinoids? Write the electronic configuration of this element. Comment on the possible oxidation state of this element.

Watch Video Solution

370. Use Hund's rule to derive the electronic configuration of Ce3+ ion, and calculate its magnetic moment on the basis of 'spin-only' formula.

Watch Video Solution

371. Name the members of the lanthanoid series which exhibit +4 oxidation and those which exhibit +2 oxidation states. This

type of behaviour with electronic configuration of these elements ?

Watch Video Solution

372. Compare the chemistry of actinides with that of the lanthanoids with special reference to electronic Configuration.

Watch Video Solution

373. Compare the chemistry of actinides with that of Lanthanides with special reference to oxidation state

Watch Video Solution

374. Compare the chemistry of actinides with that of the lanthanides with special reference to chemical reactivity.

Watch Video Solution

375. Write the electronic configurations of the elements with the atomic numbers 61, 91, 101, and 109.

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376. Compare the general characteristics of the first series of the transition metals with those of the second and third series metals in the respective vertical columns. Give special emphasis on the following points: electronic configurations

Watch Video Solution

377. Compare the general characteristics of the first series of the transition metals with those of the second and third series metals in the respective vertical columns. Give special emphasis on the following points: oxidation states

Watch Video Solution

378. Compare the general characteristics of the first series of the transition metals with those of the second and third series metals in the respective vertical columns. Give special emphasis on the following points: ionisation enthalpies

Watch Video Solution

379. Compare the general characteristics of the first series of the transition metals with those of the second and third series metals in the respective vertical columns. Give special emphasis on the following points: ionisation enthalpies

Watch Video Solution

380. Write down the number of 3d electrons in each of the following ions: Tiz+, V2+, Cr3+, Mn2*, Fe2+, Fe3+, Co2+, Ni2+ and Cu2+. Indicate how would you expect the five 3d orbitals to be occupied for these hydrated ions (octahedral).

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381. Comment on the statement that elements of the first transition series possess many properties different from those

of heavier transition elements.

Watch Video Solution

382. Express 2083 in roman numbers.

Watch Video Solution

383. Express 2085 in roman numbers.

Watch Video Solution

384. Express 2086 in roman numbers.

Watch Video Solution

385. Express 2087 in roman numbers.

Watch Video Solution

386. Express 2088 in roman numbers.

Watch Video Solution

387. Express 2100 in roman numbers.

Watch Video Solution

388. Express 2101 in roman numbers.

Watch Video Solution

389. Express 2102 in roman numbers.

Watch Video Solution

390. Express 2103 in roman numbers.

Watch Video Solution

391. Express 2105 in roman numbers.

Watch Video Solution

392. Express 210 in roman numbers.

Watch Video Solution

393. Express 2107 in roman numbers.

Watch Video Solution

394. Although +3 is the characteristic oxidation State for lanthanoids but cerium also shows +4 oxidation state because _____ .

Watch Video Solution

395. Express 2108 in roman numbers.

Watch Video Solution

396. When orange solution containing $Cr_2O_7^{2-}$ ion is treated with an alkali, a yellow solution is formed and when H^+ ions are added to yellow solution, an orange solution is obtained. Explain why does this happen ?

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397. Express 2110 in roman numbers.

Watch Video Solution

398. The second and third members in a group of transition metals have similar atomic radii. Why ?

Watch Video Solution

399. E^{Θ} of Cu is $+0.34V$ while that of Zn is $-0.76V$. Explain.

Watch Video Solution

400. The halides of transition elements become more covalent with increasing oxidation state of metal. Why ?

Watch Video Solution

401. While filling up of electrons in the atomic orbitals, the 4s orbital is filled before the 3d orbital but reverse happens during the ionisation of the atom. Explain why?

Watch Video Solution

402. Reactivity of transition elements decreases almost regularly from Sc to Cu.

Watch Video Solution

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

Watch Video Solution

404. The second ionisation enthalpies of both chromium and copper are higher than those of the next element. Why?

Watch Video Solution

405. What happens when 90% of copper 10% of aluminium combine together?

Watch Video Solution

406. Explain why mercury (I) ion exists as Hg_2^{2+} ion while copper (I) exists as Cu^+ ion.

Watch Video Solution

407. In the titration of Fe^{2+} ions with $KMnO_4$ in acidic medium, why is dilute H_2SO_4 used and not dilute HCl?

Watch Video Solution

408. Why is hydrated copper sulphate blue while anhydrous copper sulphate white?

Watch Video Solution

409. Which of two : cuprous chloride or cupric chloride is coloured and why ?

Watch Video Solution

410. A mixed oxide of iron and chromium, $FeO.Cr_2O_3$ is fused with sodium carbonate in the presence of air to form a yellow compound (A). On acidification, the compound (A) forms an orange coloured compound (B) which is a strong oxidising agent. Identify the compounds (A) and (B) .

Watch Video Solution

411. A mixed oxide of iron and chromium, $FeO.Cr_2O_3$ is fused with sodium carbonate in the presence of air to form a yellow compound (A). On acidification, the compound (A) forms an orange coloured compound (B) which is a strong oxidising agent. Identify write balanced chemical equations for each step.

Watch Video Solution

412. Calculate the magnetic moment (spin only) of manganese in $K_4\left[Mn(NCS)_6\right]$.

Watch Video Solution

413. $HgCl_2$ and $SnCl_2$ cannot exist in aqueous solution. Why ?

Watch Video Solution

414. $TiCl_3$ acts as a good reducing agent. Why ?

Watch Video Solution

415. In the transition series starting from Lanthanum (atom no =57), the next element hafmnium (atom no =72) why so observe this jump in atomic number ?

Watch Video Solution

416. The 4d and 5d series of transition metals have more frequent metal-metal bonding in their compounds than do the 3d transition metals. Explain.

Watch Video Solution

417. Which of the two Na^+ or Ag^+ is stronger Lewis acid and why ?

Watch Video Solution

418. Give the relationship between the equivalent weight and molecular weight of $KMnO_4$ in acidic medium.

Watch Video Solution

419. Give the relationship between the equivalent weight and molecular weight of $KMnO_4$ in alkaline medium.

Watch Video Solution

420. Give the relationship between the equivalent weight and molecular weight of $KMnO_4$ in neutral medium.

Watch Video Solution

421. Write equations for the reaction of silver bromide with hypo in photographic process.

Watch Video Solution

422. Write the iupac name of following : $[PtCl_5(NH_3)]^{-1}$

Watch Video Solution

423. Write the iupac name of following : $[Co(SCN)_4]^{-2}$

Watch Video Solution

424. Write the iupac name of following : $[Co(ONO)(NH_3)_5]SO_4$

Watch Video Solution

425. Write the iupac name of following : $[Co(NO_2)_3(H_2O)_3]$

Watch Video Solution

426. Write the iupac name of following : $K_3\left[Cr(C_2O_4)_2Cl_2\right]$

Watch Video Solution

EXERCISE

1. Name the third and fourth transition elements of first transition series.

Watch Video Solution

2. What is the theoretical magnetic moment of Ti^{3+} ion ?

Watch Video Solution

3. Which of the two Zn(+2) or V(+4) is diamagnetic ?

Watch Video Solution

4. Which out of the following ions would form coloured complexes : Ni^{2+}, Cu^{+} ?

Watch Video Solution

5. How many unpaired electrons are present in each of the following ? Fe^{2+}, Co^{2+}, Ni^{2+}

Watch Video Solution

6. Out of V^{2+} and V^{3+} which is more paramagnetic and why ?

Watch Video Solution

7. Calculate the magnetic moment of Fe^{2+} ion (Z = 26).

Watch Video Solution

8. Name and write electronic configuration first three elements of second transition series

Watch Video Solution

9. Why Zn^{2+} salts are colourless and Ni2+ salts are coloured?

Watch Video Solution

10. A compound has been found to have magnetic moment of 3.9 B.M. How many unpaired electrons does it contain ?

Watch Video Solution

11. Name the catalyst of Vanadium used for oxidation of SO_2 to SO_3 in contact process.

Watch Video Solution

12. Give reason, Mn^{2+} ion is more paramagnetic than Fe^{2+} ion.

Watch Video Solution

13. Express 1312 in roman numbers.

Watch Video Solution

14. Express 1313 in roman numbers.

Watch Video Solution

15. Express 1315 in roman numbers.

Watch Video Solution

16. Express 1320 in roman numbers.

Watch Video Solution

17. One day is equal to ..... seconds.

Watch Video Solution

18. Write ionic equation showing $KMnO_4$ acting as an oxidising agent in acidic medium.

Watch Video Solution

19. The oxidation state of chromium in dichromate ion $\left(Cr_2O_7^{2-}\right)$ and chromate ion $\left(CrO_4^{2-}\right)$ is

Watch Video Solution

20. What is the oxidation state of Mn is manganate ion.

Watch Video Solution

21. What is the oxidation state of Cr in CrO_5.

Watch Video Solution

22. Calculate equivalent weight of $KMnO_4$ in acidic medium.

Watch Video Solution

23. Calculate equivalent weight of $KMnO_4$ in alkaline medium.

Watch Video Solution

24. Complete the following chemical equation :

$MnO_4^-(aq) + H_2O_2(aq) + H^+(aq) \rightarrow$

Watch Video Solution

25. Complete the chemical reaction :

$S_2O_3^{2-} + Cr_2O_7^{2-} + H^+ \rightarrow$

Watch Video Solution

26. The shape of sulphate ion is

Watch Video Solution

27. In chromyl chloride test orange red vapours are obtained. These are due to .....

Watch Video Solution

28. Why is $La(OH)_3$ more basic than $Lu(OH)_3$?

Watch Video Solution

29. What is the most common oxidation state in the Lanthanoids ?

Watch Video Solution

30. How many unpaired electrons are present in Gd(Z = 64) ?

Watch Video Solution

31. Name the actinoid used for the manufacture of fine rods for atomic reactors.

Watch Video Solution

32. Arrange $Ce^{3+}(Z=58), Sm^{3+}(Z=62)$ and $Yb^{3+}(Z=70)$ in decreasing order of ionic radii.

Watch Video Solution

33. Name the basic cause of similar atomic radii of Hf and Zr.

Watch Video Solution

34. Does actinoids show actinoid contraction similar to lanthanoid contraction ?

Watch Video Solution

35. Name the trivalent lanthanoid having the configuration $[Xe]4f^7$.

Watch Video Solution

36. Which of the following ion is colourless ?

U^{3+}, Cm^{4+}, Th^{4+}

Watch Video Solution

37. Write the number of unpaired electrons in Pr^{4+}

Watch Video Solution

38. True of False : Mn_2O_7 is a basic oxide.

Watch Video Solution

39. Write reactions of $KMnO_4$, in neutral medium with : $MnSO_4$

Watch Video Solution

40. Why are Ni^{2+} compounds thermodynamically more stable than Pt^{2+} compounds whereas Pt^{4+} compounds are

relatively more stable than Ni^{4+} compounds ?

Watch Video Solution

41. True of False : Both La^{3+} and Lu^{3+} are diamagnetic.

Watch Video Solution

42. True of False : The number of unpaired electrons in V^{2+} is 2

Watch Video Solution

43. Explain the structure of $Cr_2O_7^{2-}$

Watch Video Solution

44. Ti^{3+} compounds appear purple. Why?

Watch Video Solution

45. Complete the following statement- Carrot, Spinach, tomato, red bell pepper are rich in-

Watch Video Solution

46. What is the oxidation state of Cr in CrO_5.

Watch Video Solution

47. True of False : Lanthanide compounds are less basic than actinide compounds.

Watch Video Solution

48. Complete the missing links: In CrO_4^{2-} ion, Cr is ..... hybridised.

Watch Video Solution

49. Write the general electronic configuration of transition elements.

Watch Video Solution

50. What is the most common oxidation state in the Lanthanoids ?

Watch Video Solution

51. Mention all the oxidation states exhibited by chlorine in its compounds?

Watch Video Solution

52. The chromate ion in acidic medium changes to ..... ion.

Watch Video Solution

53. The formula of chromite is ..... .

Watch Video Solution

54. Transition elements

Watch Video Solution

55. The spin only magnetic moment for ion having d^8 electronic configuration is ..... B.M.

Watch Video Solution

56. What happens when: $K_2Cr_2O_7$ is heated ?

Watch Video Solution

57. What happens when potassium dichromate is heated with sodium chloride and conc. H_2SO_4 ?

Watch Video Solution

58. The most common mineral containing lanthanum is .....

.

Watch Video Solution

59. The element of second transition series which shows maximum number of oxidation state is :

Watch Video Solution

60. The theoretical magnetic moment of Sc^{3+} ion is ..... B.M.

Watch Video Solution

61. Explain the structure of $Cr_2O_7^{2-}$

Watch Video Solution

62. Calculate equivalent weight of $KMnO_4$ in alkaline medium.

Watch Video Solution

63. Express 1316 in roman numbers.

Watch Video Solution

64. Name a member of the lanthanoid series which is well known to exhibit +4 oxidation state.

Watch Video Solution

65. The formula of Prussion blue is ..... .

Watch Video Solution

66. Name the actinoid used for the manufacture of fine rods for atomic reactors.

Watch Video Solution

67. The last element in the actinoid series is :

Watch Video Solution

68. Choose the correct alternative: Cerium (Z = 58) exhibits +2/+4 oxidation state.

Watch Video Solution

69. Express 1031 in roman numbers.

Watch Video Solution

70. NO_2^- is oxidised to N_2/NO_3^- by acidified $KMnO_4$.

Watch Video Solution

71. As we proceed from $La(OH)_3$ to $Lu(OH)_3$ basic strength increases / decreases .

Watch Video Solution

72. Misch metal alloy contains about 95% lanthanoid/actinoid metals.

Watch Video Solution

73. Baeyer's reagent is

Watch Video Solution

74. Ionic radius of $Ce^{3+}(Z=58)$ is less/more than that of $Yb^{3+}(Z=70)$.

Watch Video Solution

75. Express 1318 in roman numbers.

Watch Video Solution

76. Express 1321 in roman numbers.

Watch Video Solution

77. Express 1322 in roman numbers.

Watch Video Solution

78. Pt^{4+} is less/more stable than Ni^{4+} .

Watch Video Solution

79. Express 1325 in roman numbers.

Watch Video Solution

80. What is the number of unpaired electrons in : Fe^{2+} ?

Watch Video Solution

81. What is the number of unpaired electrons in : Cu^{+} ?

Watch Video Solution

82. Express 1353 in roman numbers.

Watch Video Solution

83. Express 1355 in roman numbers.

Watch Video Solution

84. Express 1356 in roman numbers.

Watch Video Solution

85. Express 1357 in roman numbers.

Watch Video Solution

86. Express 1358 in roman numbers.

Watch Video Solution

87. What is the maximum oxidation state shown by actinoids?

Watch Video Solution

88. What are lanthanoids ?

Watch Video Solution

89. What are actinoids ?

Watch Video Solution

90. Express 1360 in roman numbers.

Watch Video Solution

91. Express 1361 in roman numbers.

Watch Video Solution

92. Express 1362 in roman numbers.

Watch Video Solution

93. Express 1363 in roman numbers.

Watch Video Solution

94. Why Cd^{2+} salts are white ? Cd=48

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95. What is lanthanoid contraction ?

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96. Complete the following chemical equation : $MnO_4^-(aq) + H_2O_2(aq) + H^+(aq) \rightarrow$

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97. Complete the following statement- Calcium is-

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98. Write the general electronic configuration of transition elements.

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99. What is the oxidation state of Cr in $K_2Cr_2O_7$?

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100. $KMnO_4 \xrightarrow{\Delta} ? + MnO_2 + ?$

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101. Complete the following statement- Functions of protein are-

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102. Which transition metal can show highest oxidation state ?

A. Sc

B. Ti

C. Os

D. Zn

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103. Which of the following is not an actinoid ?

A. Curium (Z= 96)

B. Californium (Z = 98)

C. Uranium (Z = 92)

D. Terbium (Z = 65)

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104. Which of the following is diamagnetic ?

A. Cu^{2+}

B. Ni^{2+}

C. Cd^{2+}

D. Ti^{3+}

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105. Misch metal is an alloy of

A. La

B. Th

C. Ac

D. none of these

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106. The maximum magnetic moment is shown by the ion with electronic configuration of

A. $3d^8$

B. $3d^7$

C. $3d^9$

D. $3d^5$

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107. Maximum oxidation number of manganese is in

A. K_2MnO_4

B. MnO_2

C. $KMnO_4$

D. Mn_2O_4

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108. Complete the following statement- Two examples of protein rich food are-

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109. Fill in the blanks- _____ is the food nutrient which is the main building block of bones and muscles.

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110. Increasing order of paramagnetism is

A. $Cu^{2+}, Co^{2+}, Mn^{2+}, Ni^{2+}$

B. $Co^{2+}Cu^{2+}, Mn^{2+}, Ni^{2+}$

C. $Cu^{2+}Ni^{2+}, Co^{2+}Mn^{2+}$

D. $Mn^{2+}, Co^{2+}, Ni^{2+}, Cu^{2+}$

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111. Draw lewis structure of water .

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112. Draw lewis structure of CO molecule.

Watch Video Solution

113. What is the basic difference between the electronic configurations of transition and inner transition elements ?

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114. Why are f-block elements placed at the bottom of the periodic table ? Give the names of the series present in the

block.

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115. Actinoid contraction is greater from element to element than lanthanoid contraction. Why?

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116. Give an explanation for the following observation : The greatest number of oxidation states are exhibited by the members in the middle of a transition series.

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117. Give an explanation for the following observation : With the same d-orbital configuration $\left(d^4\right)$, Cr^{2+} ion is a reducing agent but Mn^{3+} ion is an oxidising agent.

Watch Video Solution

118. Explain the following observation : In general, the atomic radii of transition elements decrease with atomic number in a given series.

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119. The $E^{\circ}_{M^{2+}/M}$ for copper is positive (0.34 V). Copper is the only metal in the first series of transition elements showing this behaviour.

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120. The questions given below consist of an Assertion and a Reason. Use the following key to choose the appropriate answer.

If both assertion and reason are CORRECT and reason is the CORRECT explanation of the assertion.

If both assertion and reason and CORRECT, but reason is NOT THE CORRECT explanation of the assertion.

If assertion is CORRECT but reason is INCORRECT.

If assertion is INCORRECT but reason is CORRECT.

If both assertion and reason are INCORRECT.

Assertion: E° for $Mn^{3+} \mid Mn^{2+}$ is more positive than $Cr^{3+} \mid Cr^{2+}$.

Reason: The third ionistation energy of Mn is larger that than of Cr.

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121. Which one of the following ions will exhibit colour in aqueous solutions

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122. Express 1380 in roman numbers.

Watch Video Solution

123. Draw lewis structure of hydronium ion .

Watch Video Solution

124. Write chemical reaction for preparation of K2Cr207 from chromite ore.

Watch Video Solution

125. Write the oxidation of H_2S by acidified $KMnO_4$.

Watch Video Solution

126. Write the oxidation of H_2S by acidified $KMnO_4$.

Watch Video Solution

127. What are lanthanoids ?

Watch Video Solution

128. Why transition metals show catalytic properties?

Watch Video Solution

129. How would you account for the following: The d1 configuration is very unstable in ions.

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130. How would you account for the following :

SF_6 is kinetically inert.

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131. Why is the highest oxidation state of a metal exhibited in its oxide or fluoride only ?

Watch Video Solution

132. Give reasons for the following : Copper cannot displace zinc from its salt solution..

Watch Video Solution

133. Why the actinoids exhibit a large number of oxidation states than the corresponding lanthanoids ?

Watch Video Solution

134. How would you account for the following :

SF_6 is kinetically inert.

Watch Video Solution

135. Why the actinoids exhibit a large number of oxidation states than the corresponding lanthanoids ?

Watch Video Solution

136. How would you account for the following ? Most of the transition metal ions exhibit characteristic colours in aqueous solutions.

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137. Why enthalpy of atomisation of the transition elements are quite high ?

Watch Video Solution

138. Give an explanation for the following observation : The greatest number of oxidation states are exhibited by the members in the middle of a transition series.

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139. Give reason, Mn^{2+} ion is more paramagnetic than Fe^{2+} ion.

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140. Complete the following chemical equation :

$Cr_2O_7^{2-}(aq) + Fe^{2+}(aq) + H^+(aq) \rightarrow$

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141. Complete the following chemical equation :

$2CrO_4^{2-} + 2H^+ \rightarrow$

Watch Video Solution

142. Complete the following chemical equation :

$MnO_4^-(aq) + H_2O_2(aq) + H^+(aq) \rightarrow$

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143. What are interstitial compounds ? Why are such compounds well known for transition metals.

Watch Video Solution

144. Write uses of actinoids.

Watch Video Solution

145. Write reactions of $K_2Cr_2O_7$, in acidic medium with Kl

Watch Video Solution

146. Write one oxidising reaction of $KMnO_4$ in basic medium.

Watch Video Solution

147. What are different oxidation states exhibited by lanthanoids ?

Watch Video Solution

148. Draw the structure of chromate ion CrO_4^{2-}

Watch Video Solution

149. Write the oxidation of H_2S by acidified $KMnO_4$.

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150. Explain magnetic behaviour of transition elements.

Watch Video Solution

151. Explain the structure of $Cr_2O_7^{2-}$

Watch Video Solution

152. Give balanced equations for the reaction between Acidified Potassium dichromate and Sulphur dioxide (SO_2) gas.

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153. Describe the preparation of potassium permanganate. How does the acidified permanganate solution react with (i) iron(II) ions Write the ionic equations for the reactions

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154. Transition elements and their compounds are found to be good catalysts. Give examples.

Watch Video Solution

155. What is lanthanoid contraction ?

Watch Video Solution

156. Give the preparation of Potassium Permanganate from Pyrolusite ore.

Watch Video Solution

157. Which element belongs to d-block elements ?

Watch Video Solution

158. How many groups are there in d-block element?

Watch Video Solution

159. What are inner transition elements ? How do they differ from transition elements ?

Watch Video Solution

160. How does lanthanoid contraction affect the physical and chemical properties of the elements of lanthanoid series ?

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161. How does $KMnO_4$ act as a powerful oxidizing agent in neutral, alkaline or acidic medium ?

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162. Give the general outer electronic configurations of p and d-block elements ?

Watch Video Solution

163. Which of the following group of transition metals is called coinage metals?

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164. Why separation of lanthanoid elements is difficult ?

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165. Zn, Cd, Hg are sometimes not considered as transition elements. Comment.

Watch Video Solution

166. Why Zr and Hf exhibit similar properties ?

Watch Video Solution

167. Write the electronic configurations of Fe^{2+} and Fe^{3+}. which of the two has larger paramagnetic character ? Atomic number of Fe is 26.

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168. Explain :Transition elements exhibit variable oxidation states.

Watch Video Solution

169. What are the main consequences of lanthanoid contraction ?

Watch Video Solution

170. Complete the following chemical equation : $KMnO_4 \xrightarrow{513K}$

Watch Video Solution

171. Complete the following chemical equation : $MnO_2 + KOH + O_2 \rightarrow$

Watch Video Solution

172. Does actinoids show actinoid contraction similar to lanthanoid contraction ?

Watch Video Solution

173. Transition metals form mostly coloured compounds.Explain.

Watch Video Solution

174. Complete the following chemical equation : $MnO_4^-(aq) + H_2O_2(aq) + H^+(aq) \rightarrow$

Watch Video Solution

175. Give the preparation of Potassium Permanganate from Pyrolusite ore.

Watch Video Solution

176. Explain how the colour of a solution of $K_2Cr_2O_7$ depends on the pH of the solution ?

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177. Explain, giving reasons, which one of the following pairs exhibits the property indicated : Sc^{3+} or Cr^{3+} exhibits paramagnetism .

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178. Explain, giving reasons, which one of the following pairs exhibits the property indicated : V or Mn, which one exhibits more number of oxidation states.

Watch Video Solution

179. Write chemical reaction for preparation of K2Cr207 from chromite ore.

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180. Why is Copper considered as transition metal ?

Watch Video Solution

181. Calculate the number of unpaired electrons in the following gaseous ions: Mn3+, Cr3+, V3+ and Ti3+. Which one of these is the most stable in aqueous solution?

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182. State what happens when a solid mixture of KCl and $K_2Cr_2O_7$ is heated with conc. sulphuric acid. Give balanced chemical equation.

Watch Video Solution

183. To what extent do the electronic configurations decide the stability of oxidation states in the first series of the transition elements? Illustrate your answer with examples.

Watch Video Solution

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

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185. Write the name of metal which shows only +3 oxidation state.

Watch Video Solution

186. What is lanthanoid contraction ?

Watch Video Solution

187. Give the general electronic configuration of d-block elements.

Watch Video Solution

188. Out of Fe^{2+} and `Fe^(3+) which is more paramagnetic and why ?

Watch Video Solution

189. What is Actinoid contraction ? Explain it.

Watch Video Solution

190. What arecoinage metals ?

Watch Video Solution

191. What are transition elements ? Which of the d block elements are not regarded as transition elements and why ?

Watch Video Solution

192. Most of transition metals show variable oxidation states. Explain

Watch Video Solution

193. Give the cause of Lanthanide Contraction.

Watch Video Solution

194. What is Misch metal ?

Watch Video Solution

195. What is Lanthanide contraction ? What is the cause and consequences of Lanthanide contraction ?

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196. Write two similarities between Lanthanides and Actinides. $La(OH)_3$ is more basic than $Lu(OH)_3$. Explain.

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197. Answer the following: Aqueous solution of Ti^{4+} is colourless, but aqueous solution of Ti^{3+} is violet in colour. Explain.

Watch Video Solution

198. Answer the following: Copper (I) has d^{10} configuration while copper (II) has d^9 configuration, still copper (II) is more stable in aqueous solution than copper (I). Why?

Watch Video Solution

199. What are lanthanoids ?

Watch Video Solution

200. Give the chemical equation for the reaction between a saturated solution of sodium dichromate and potassium chloride .

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201. A mixed oxide of iron and chromium, $FeO.Cr_2O_3$ is fused with sodium carbonate in the presence of air to form a yellow compound (A). On acidification, the compound (A) forms an orange coloured compound (B) which is a strong oxidising agent. Identify the compounds (A) and (B) .

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202. A mixed oxide of iron and chromium, $FeO.Cr_2O_3$ is fused with sodium carbonate in the presence of air to form a yellow compound (A). On acidification, the compound (A) forms an orange coloured compound (B) which is a strong oxidising agent. Identify the compounds (A) and (B) .

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203. Complete the following chemical equation :

$8MnO_4^- + 3S_2O_3^{2-} + H_2O \rightarrow$

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204. Complete the following reaction equation :

$Cr_2O_7^{2-} + Sn^{2+} + H^+ \rightarrow$

Watch Video Solution

205. Account for the following: Mn shows the highest oxidation state of +7 with oxygen but with fluorine it shows the highest oxidation state of +4.

Watch Video Solution

206. Give reasons: Transition metals show variable oxidation states.

Watch Video Solution

207. Does actinoids show actinoid contraction similar to lanthanoid contraction ?

Watch Video Solution

208. Transition elements and their compounds are found to be good catalysts. Give examples.

Watch Video Solution

209. How would you account for the irregular variation of ionisation enthalpies (first and second) in the first series of the transition elements?

Watch Video Solution

210. How would you account for the following: There is a greater range of oxidation states among the actinoids than among the lanthanoids.

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211. Complete the following chemical equation : $MnO_4^-(aq) + H_2O_2(aq) + H^+(aq) \rightarrow$

Watch Video Solution

212. Complete the following chemical equation : $Cr_2O_7^{2-} + 6Fe^{2+} + 14H^+ \rightarrow$

Watch Video Solution

213. Which among the followings is most basic in aqueous solution

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214. Which of the 3d-series of transition elements exhibits the largestn number of oxidation states and why ?

Watch Video Solution

215. Give an explanation for the following observation : With the same d-orbital configuration $\left(d^4\right)$, Cr^{2+} ion is a reducing agent but Mn^{3+} ion is an oxidising agent.

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216. Which of the 3d-series of transition elements exhibits the largestn number of oxidation states and why ?

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217. How would you account for the following ? Metal-metal bonding is more frequent in 4d or 5d series of transition metals than in the 3d series .

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218. Among lanthanoids, Ln (III) compounds are predominant. However, occasionally in solutions on in solid compounds, + 2 and +4 ions are also obtained.

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219. The $E^{\circ}_{M^{2+}/M}$ for copper is positive (0.34 V). Copper is the only metal in the first series of transition elements showing this behaviour.

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220. Express 1381 in roman numbers.

Watch Video Solution

221. Transition metals form number of interstitial compounds. Explain.

Watch Video Solution

222. Explain the following observation : There is a general increase in density from titanium (Z = 22) to copper (Z = 29).

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223. Why the actinoids exhibit a large number of oxidation states than the corresponding lanthanoids ?

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224. Why do transition metals have high enthalpies of atomization ?

Watch Video Solution

225. How would you account for the following: There is a greater range of oxidation states among the actinoids than among the lanthanoids.

Watch Video Solution

226. Why do transition metals form complexes ?

Watch Video Solution

227. Express 1365 in roman numbers.

Watch Video Solution

228. Write chemical reaction for preparation of K2Cr207 from chromite ore.

Watch Video Solution

229. Transition metals form number of interstitial compounds. Explain.

Watch Video Solution

230. Compare the chemistry of actinides with that of the lanthanoids with special reference to electronic Configuration.

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231. Compare the chemistry of actinides with that of Lanthanides with special reference to oxidation state

Watch Video Solution

232. Compare the chemistry of actinides with that of the lanthanides with special reference to chemical reactivity.

Watch Video Solution

233. Compare the chemistry of actinides with that of the lanthanides with special reference to atomic and ionic sizes.

Watch Video Solution

234. Compare the chemistry of actinides with that of the lanthanides with special reference to atomic and ionic sizes.

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235. How do you prepare: K_2MnO_4 from MnO_2 ?

Watch Video Solution

236. How do you prepare: $Na_2Cr_2O_7$ from Na_2CrO_4 ?

Watch Video Solution

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

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238. To what extent do the electronic configurations decide the stability of oxidation states in the first series of the transition elements? Illustrate your answer with examples.

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239. How would you account for the following: There is a greater range of oxidation states among the actinoids than among the lanthanoids.

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240. The element of second transition series which shows maximum number of oxidation state is :

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241. Express 1366 in roman numbers.

Watch Video Solution

242. Why Cr^{2+} is strongly reducing while Mn^{3+} is strongly oxidising ?

Watch Video Solution

243. Name the members of lanthanoid series which exhibit +2 O.S. Assign reason for this.

Watch Video Solution

244. Express 1367 in roman numbers.

Watch Video Solution

245. Why Cu(I) is colourless and Cu(II) is blue in colour ?

Watch Video Solution

246. Write any two consequences of lanthanoids contraction.

Watch Video Solution

247. Why are I.E. of 5d - elements greater than 3d- elements ?

Watch Video Solution

248. Write the general electronic configuration of transition elements.

Watch Video Solution

249. Give three differences between lanthanides and actinides.

Watch Video Solution

250. What happens when: $KMnO_4$ is heated at 746 K ?

Watch Video Solution

251. What happens when: $K_2Cr_2O_7$ is heated ?

Watch Video Solution

252. Explain why $\left[Ti(H_2O)_6\right]^{3+}$ is violet while $\left[Ti(H_2O)_6\right]^{4+}$ is colourless.

Watch Video Solution

253. Transition metals form alloys with other transition metals. Explain.

Watch Video Solution

254. What are the main consequences of lanthanoid contraction ?

Watch Video Solution

255. What happens when $K_2Cr_2O_7$ reacts with NaCl in the presence of conc. H_2SO_4.

Watch Video Solution

256. What happens when Acidified $KMnO_4$ reacts with H_2S?

Watch Video Solution

257. Explain why $TiCl_3$ is coloured but $TiCl_4$ is colourless ?

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258. Why transition metals show catalytic properties?

Watch Video Solution

259. Compare the chemistry of actinides with that of the lanthanides with special reference to chemical reactivity.

Watch Video Solution

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

Watch Video Solution

261. Why transition elements form a large number of alloys ?

Watch Video Solution

262. Write chemical reaction for preparation of K2Cr207 from chromite ore.

Watch Video Solution

263. What are the main consequences of lanthanoid contraction ?

Watch Video Solution

264. Why transition metals show catalytic properties?

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265. Out of Ag^{+} and Co^{2+} which one will be coloured and why? (Atomic number of Ag is, 47 and Co is 27).

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266. Why is + 4 oxidation state of titanium more stable than its +3 state? (Z = 22)

Watch Video Solution

267. Is Zinc (At. No. 30) a transition element ?

Watch Video Solution

268. Give the comparison of lanthanides and actinides.

Watch Video Solution

269. Express 1368 in roman numbers.

Watch Video Solution

270. Express 1370 in roman numbers.

Watch Video Solution

271. Express 1371 in roman numbers.

Watch Video Solution

272. Express 1372 in roman numbers.

Watch Video Solution

273. Express 1373 in roman numbers.

Watch Video Solution

Watch Video Solution

274. Express 1375 in roman numbers.

Watch Video Solution

275. Express 1376 in roman numbers.

Watch Video Solution

276. Why +3 oxidation state of Fe (Z = 26) is more stable than its +2 oxidation state ?

Watch Video Solution

277. Is Au (Z = 79) a transition metal or not ? Explain.

Watch Video Solution

278. Express 1377 in roman numbers.

Watch Video Solution

279. Express 1378 in roman numbers.

Watch Video Solution

280. Why the actinoids exhibit a large number of oxidation states than the corresponding lanthanoids ?

Watch Video Solution

281. Transition elements and their compounds are found to be good catalysts. Give examples.

Watch Video Solution

282. Complete the following chemical equation : $Cr_2O_7^{2-}(aq) + H_2S(g) + H^+(aq) \rightarrow$

Watch Video Solution

283. Complete the following chemical equation : $Cu^{2+}(aq) + I^-(aq) \rightarrow$

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284. How would you account for the following ? The oxidising power of oxoanions are in the order

$VO_2^+ < Cr_2O_7^{2-} < MnO_4^-$.

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285. Why is the third ionization enthalpy of manganese (At. no.=25) unexpectedly high ?

Watch Video Solution

286. How would you account for the following ? Cr^{2+} is stronger reducing agent than Fe^{2+}.

Watch Video Solution

287. Express 1382 in roman numbers.

Watch Video Solution

288. Complete the following chemical equation :

$Cr_2O_7^{2-}(aq) + Fe^{2+}(aq) + H^+(aq) \rightarrow$

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289. Explain the following observation : La^{3+} (Z =57) and Lu^{3+} (Z = 71) do not show any colour in solutions.

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290. Explain the following observation : Among the divalent cations in the first series of transition elements, manganese exhibits the maximum paramagnetism .

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291. Explain the following observation : Cu^+ ion is not known in aqueous solutions.

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292. Fill in the blanks- _____ is the vitamin which is the component of rhodopsin.

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293. Give reason for the following : $E^{\circ}_{M^{2+}|M}$ values are not regular for first row transition metals (3d series).

Watch Video Solution

294. Give reason for the following : Although 'F' is more electronegative than 'O', the highest Mn fluoride is MnF_4, whereas the highest oxide is Mn_2O_7.

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295. Complete the following chemical equation : $2CrO_4^{2-} + 2H^+ \rightarrow$

Watch Video Solution

296. Complete the following chemical equation : $KMnO_4 \xrightarrow{513K}$

Watch Video Solution

297. Why do transition elements show variable oxidation states ? Name the element showing maximum number of oxidation states among the first series of transition metals from Sc (Z = 21) to Zn (Z= 30).

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298. Write the name of metal which shows only +3 oxidation state.

Watch Video Solution

299. What is lanthanoid contraction ? Name an important alloy which contains some of the lanthanoid metals.

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300. Complete the following equation : $Cr_2O_7^{2-} + 2OH^- \rightarrow$

Watch Video Solution

301. Complete the following equation : $MnO_4^- + 4H^+ + 3e^- \rightarrow$

Watch Video Solution

302. Account for the following : Zn is not considered as a transition element.

Watch Video Solution

303. Transition metals formlarge number of complex compounds.Explain.

Watch Video Solution

304. Account for the following : The E° value for the $Mn^{3+} \mid Mn^{2+}$ couple is much more positive than that for $Cr^{3+} \mid Cr^{2+}$ couple.

Watch Video Solution

305. Give three differences between lanthanides and actinides.

Watch Video Solution

306. Name a member of the lanthanoid series which is well known to exhibit +4 oxidation state.

Watch Video Solution

307. Complete the following equation :

$MnO_4^- + 8H^+ + 5e^- \rightarrow$

Watch Video Solution

308. Out of Mn^{3+} and Cr^{3+} which is more paramagnetic and why ? (Atomic nos. Mn = 25, Cr = 24)

Watch Video Solution

309. Account for the following: Mn shows the highest oxidation state of +7 with oxygen but with fluorine it shows the highest oxidation state of +4.

Watch Video Solution

310. Why Zr and Hf exhibit similar properties ?

Watch Video Solution

311. Why transition metals show catalytic properties?

Watch Video Solution

312. Complete the following chemical equation : $MnO_2 + KOH + O_2 \rightarrow$

Watch Video Solution

313. Complete the following equation : $Cr_2O_7^{2-} + 2OH^- \rightarrow$

Watch Video Solution

314. Account for the following : Zn is not considered as a transition element.

Watch Video Solution

315. The elements of 3d transition series are given as: Sc Ti V Cr Mn Fe Co Ni Cu Zn Answer the following: Which element has the highest m.p?

Watch Video Solution

316. The elements of 3d transition series are given as: Sc Ti V Cr Mn Fe Co Ni Cu Zn Answer the following: Write the element which can show an oxidaition state of +1.

Watch Video Solution

317. The elements of 3d transition series are given as: Sc Ti V Cr Mn Fe Co Ni Cu Zn Answer the following: Write the element which can show an oxidaition state of +1.

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318. Raghav was returning with his family from a marriage party. On the way, a traffic policeman stopped their car. He asked Raghav's father who was driving the car to exhale his breath into an instrument to check whether he has drunk or not. After checking from the instrument, he allowed them to go. As a student of chemistry: Can you explain the theory behind this test ?

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319. Raghav was returning with his family from a marriage party. On the way, a traffic policeman stopped their car. He asked Raghav's father who was driving the car to exhale his breath into an instrument to check whether he has drunk or not. After checking from the instrument, he allowed them to go. As a student of chemistry: Name the instrument used by the traffic policeman.

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320. Draw the lewis dot structure of CCl4 .

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321. The decomposition of potassium chlorate $(KClO_3)$ is a slow process. But the decomposition becomes fast in the

presence of a black powder. Answer the following question : Why does the use of black powder make the decomposition fast?

Watch Video Solution

322. The decomposition of potassium chlorate $(KClO_3)$ is a slow process. But the decomposition becomes fast in the presence of a black powder. Answer the following question : What is black powder?

Watch Video Solution

323. Draw lewis structure of OF_2

Watch Video Solution

324. Draw lewis structure of H_2O_2

Watch Video Solution

325. Zinc is a transition element and has many useful applications. The presence of zinc in trace amounts is essential in humans and many animals. Answer the following question : What is the role of zinc in the body of humans and animals?

Watch Video Solution

326. Zinc is a transition element and has many useful applications. The presence of zinc in trace amounts is essential in humans and many animals. Answer the following question : A

compound of zinc is used as a rodent poison. Name the compound.

Watch Video Solution

327. Zinc is a transition element and has many useful applications. The presence of zinc in trace amounts is essential in humans and many animals. Answer the following question : Name the compound of zinc used in paints.

Watch Video Solution

328. Zinc is a transition element and has many useful applications. The presence of zinc in trace amounts is essential in humans and many animals. Answer the following question : Is $ZnSO_4$(aq) coloured or colourless?

Watch Video Solution

329. Give the electronic configuration of copper (Z = 29).

A. $[Ar]3d^9 4s^2$

B. $[Ar]3d^{10} 4s^1$

C. $[Ar]3d^8 4s^2$

D. $[Ar]3d^{10} 4s^2$

Watch Video Solution

330. Why transition elements are called d-block elements ?

A. nd-(n + 1)s transition

B. nd-(n + 1)p transition

C. nd-nd transition

D. nd-(n + 1)d transition.

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331. Which of the following ions does not give coloured solution ?

A. Fe^{2+}

B. Zn^{2+}

C. Cr^{3+}

D. Mn^{2+}.

Watch Video Solution

332. When potassium dichromate is heated with potassium hydroxide

and the solution obtained is acidified, the colour becomes

A. yellow

B. green

C. orange

D. blue.

Watch Video Solution

333. In which of the following ions, the colour is not due to d-d transition ?

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

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

C. $[CoF_6]^{3-}$

D. CrO_4^{2-} .

Watch Video Solution

334. Percentage of gold in 18 carat gold is:

A. 0.3867

B. $75.0\ \%$

C. $80.0\ \%$

D. $20.0\ \%$

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335. In a reaction, K_2MnO_4 is converted into $KMnO_4$. The change

in the oxidation number of Mn is :

A. zero

B. $+1$

C. -1

D. $+7$.

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336. Draw lewis structure of NF3.

A.

B.

C.

D.

Watch Video Solution

337. Which of the following is an acidic oxide ?

A. Mn_2O_7

B. Mn_3O_4

C. MnO

D. Mn_2O_3 .

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338. Which of the following ions has smallest radius ?

A. Mn^{2+}

B. Ni^{2+}

C. Ti^{2+}

D. V^{2+}

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339. Draw lewis dot structure of nitrous acid HNO_2

A.

B.

C.

D.

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340. Draw lewis dot structure of CH_4

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341. Draw lewis dot structure of phosphoric acid H_3PO_4

A.

B.

C.

D.

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342. Which metal has lowest melting point? Cs Hg Mn Cu

A. Cs

B. He

C. Mn

D. Cu.

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343. The maximum oxidation state of Os is ?

A. $+6$

B. $+7$

C. $+5$

D. $+8.$

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344. The outer shell electronic configuration of Gd (Z = 64) is

A. $4f^7 5d^1 6s^2$

B. $4f^8 6s^2$

C. $4f^9 6s^1$

D. $4f^7 5d^2 6s^1$.

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345. The stable oxidation state of Ce (Z = 58) is

A. $+4$

B. $+2$

C. $+5$

D. None of these

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346. What happens when: $KMnO_4$ is heated at 746 K ?

A. K_2MnO_4, Mn_2O_3

B. K_2MnO_4, MnO, O_2

C. K_2MnO_4, MnO_2, O_2

D. K_2MnO_4, MnO_2, O_3

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347. Chromyl chloride is :

A. CrO_2Cl_2

B. $CrOCl_2$

C. $CrCl_3$

D. Cr_2OCl_2

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348. What is the maximum oxidation state shown by Manganese in its compounds ? Name one such compound ?

A. $+7$

B. $+6$

C. $+5$

D. $+8$.

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349. Complete the chemical reaction :

$S_2O_3^{2-} + Cr_2O_7^{2-} + H^+ \rightarrow$

A. OH^-

B. H_2O

C. H^+

D. O_2

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350. In which of the following pairs, the atomic size is almost the same ?

A. La - Ce

B. Nb - Ta

C. Zr - Hf

D. Nb - Zr.

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351. The hybridisation of Cr in $Cr_2O_7^{2-}$ ion is

A. sp^3d

B. sp^3d^2

C. sp^3

D. sp^2 .

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352. In alkaline medium, equivalent weight of $KMnO_4$ is ,

A. 31.6

B. 52.67

C. 79

D. 158

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353. What is lanthanoid contraction ?

A. Zr and Y have about the same radius

B. Zr and Nb have similar oxidation state

C. Zr and Hf have about the same radius

D. Zr and Zn have the same oxidation state.

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354. In acidic medium the equivalent weight of $K_2Cr_2O_7$, is :

A. M

B. M/2

C. M/3

D. M/6.

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355. Ammonium dichromate is used in fireworks. The green coloured powder blown in air is

A. CrO_3

B. Cr_2O_3

C. Cr

D. $CrO(O_2)$

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356. The number of moles of $KMnO_4$ that will be needed to react with

one mole of sulphite ion acidic solution, is

A. $2/5$

B. $3/5$

C. $4/5$

D. 1

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357. The number of unpaired electrons in Ni^{2+} is

A. Zero

B. 2

C. 4

D. 8

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358. The electronic configuration of terbium (IV) (At. No. 65) is

A. $[Xe]4f^5 6s^2$

B. $[Xe]4f^7 6s^0$

C. $[Xe]4f^8 6s^0$

D. $[Xe]4f^7 6s^2$

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359. Which of the following statement is not correct ?

A. $La(OH)_3$ is less basic than $Lu(OH)_3$

B. In lanthanoid series, ionic radius decreases from a La^{3+} to Lu^{3+} ion.

C. La is actually an element of transition series rather than lanthanoids

D. Atomic radius of Zr and Hf are same because of lanthanoid contraction.

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360. In the standardisation of $Na_2S_2O_3$ using $K_2Cr_2O_7$ by iodometry, the equivalent weight of $K_2Cr_2O_7$ is :

A. mol wt/2

B. mol wt/6

C. mol wt/3

D. same as mol wt.

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361. How many moles of electrons are required to reduce 1 mol of MnO_4^- to Mn^{2+}?

A. 3, 5, 4 and 1

B. 4, 3, 1 and 5

C. 1, 3, 4 and 5

D. 5, 4, 3 and 1.

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362. The basic character of the transition metal monoxides follows the order :

A. $VO > CrO > TiO > FeO$

B. $CrO > VO > FeO > TiO$

C. $TiO > FeO > VO > CrO$

D. $TiO > VO > CrO > FeO$

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363. The correct order of ionic radii of Y^{3+}, La^{3+}, Eu^{3+} and Lu^{3+} is :

A. $Y^{3+} + < La^{3+} < Eu^{3+} < Lu^{3+}$

B. $Y^{3+} < Lu^{3+} + < Eu^{3+} + < La^{3+}$

C. $Lu^{3+} < Eu^{3+} < La^{3+} + < Y^{3+}$

D. `La^(3+) lt Eu^(3+) lt Lu^(3+) lt Y^(3+).

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364. Which one of the following ions will exhibit colour in aqueous solutions

A. Sc^{3+}, Ti

B. Sc^{3+}, Co^{2+}

C. Ni^{2+}, Cu^{+}

D. Ni^{2+}, Ti^{3+}

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365. The number of moles of $KMnO_4$ that will be needed to react with

one mole of sulphite ion acidic solution, is

A. 1

B. $3/5$

C. $4/5$

D. $2/5$

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366. Which one of the following ions will exhibit colour in aqueous solutions

A. Mn^{3+}

B. Cr^{3+}

C. V^{3+}

D. Ti^{3+}

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367. The correct order of decreasing second ionisation enthalpy of Ti (22), V (23), Cr (24) and Mn (25)

A. $V > Mn > Cr > Ti$

B. $Mn > Cr > Ti > V$

C. $Ti > V > Cr > Mn$

D. $Cr > Mn > V > Ti$

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368. Which of the 3d-series of transition elements exhibits the largestn number of oxidation states and why ?

A. $3d^5 4s^1$

B. $3d^5 4s^2$

C. $3d^2 4s^2$

D. $3d^3 4s^2$

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369. Which one of the following ions will exhibit colour in aqueous solutions

A. $Lu^{3+}(Z=71)$

B. $Sc^{3+}(Z=21)$

C. $La^{3+}(Z=57)$

D. $Ti^{3+}(Z=22)$

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370. Which of the following pairs has the same size ?

A. Zr^{4+}, Hf^{4+}

B. Zn^{2+}, Hf^{4+}

C. Fe^{2+}, Ni^{2+}

D. Zr^{4+}, Ti^{4+}

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371. Acidified $K_2Cr_2O_7$ solution turns green when $Na - 2SO_3$, is added to it. This is due to the formation of

A. $Cr_2(SO_4)_3$

B. CrO_4^{2-}

C. $Cr_2(SO_3)_3$

D. $CrSO_4$

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372. Draw lewis structure of H_2S

A.

B.

C.

D.

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373. Which of the following statements is not true?

A. On passing H_2S through acidified $K_2Cr_2O_7$ solution, a milky colour is observed.

B. $Na_2Cr_2O_7$ is preferred over $K_2Cr_2O_7$ in volumetric analysis.

C. $K_2Cr_2O_7$ solution in acidic medium is orange.

D. $K_2Cr_2O_7$ solution becomes yellow on increasing the pH beyond 7.

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374. Which of the following does not give oxygen on heating ?

A. $K_2Cr_2O_7$

B. $(NH_4)_2Cr_2O_7$

C. $KClO_3$

D. $Zn(ClO_3)_2$

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375. Which of the following lanthanoid ions is diamagnetic ?

(At. nos. Ce = 68, Sm = 62, Eu = 63, Yb = 70)

A. Eu^{2+}

B. Yb^{2+}

C. Ce^{2+}

D. Sm^{2+}

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376. Reason of lanthanoid contraction is :

A. negligible screening effect of 'f'-orbitals

B. increasing nuclear charge

C. decreasing nuclear charge

D. decreasing screening effect.

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377. The reaction of acidified $KMnO_4$ with H_2O_2 gives .

A. Mn^{4+} and O_2

B. Mn^{2+} and O_2

C. Mn^{2+} and O_3

D. Mn^{4+} and MnO_2

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378. The pair of compounds that cannot exist together is :

A. $FeCl_3, SnCl_2$

B. $HgCl_2, SnCl_2$

C. $FeCl_2, SnCl_2$

D. $FeCl_3, KI$

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379. Magnetic moment of 5.92 B.M. is given by which of the following

ion ?

A. Ti^{3+}

B. Ni^{2+}

C. Co^{2+}

D. Mn^{2+}.

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380. Gadolinium belong to 4 f series $(Z = 64)$. Which of the following is its correct electronic configuration ?

A. $[Xe]4f^{7}5d^{1}6s^{2}$

B. $[Xe]4f^{6}5d^{2}6s^{2}$

C. $[Xe]4f^{8}6d^{2}$

D. $[Xe]4f^{9}5s^{1}$

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381. Because of lanthanoid contraction, which of the following pairs of elements have nearly same atomic radii? (Numbers in the parenthesis are atomic numbers)

A. Zr(40) and Hf(72)

B. Zr(40) and Ta(73)

C. Ti(22) and Zr(40)

D. Zr(40) and Nb(41)

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382. Which one of the following statement is correct when SO_2 is passed through acidified $K_2Cr_2O_7$ solution?

A. SO_2 is reduced

B. Green $Cr_2(SO_4)_3$ is formed

C. The solution turns blue

D. The solution is decolourised

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383. The outer shell electronic configuration of Gd (Z = 64) is

A. $[Xe]4f^6 5d^1 6s^2$, $[Xe]4f^7 5d^1 6s^2$ and $[Xe]4f^8 5d^1 6s^2$

B. $[Xe]4f^7 6s^2$, $[Xe]4f^7 5d^1 6s^2$ and $[Xe]4f^9 6s^2$

C. $[Xe]4f^7 6s^2$, $[Xe]4f^8 5d^1 6s^2$ and $[Xe]4f^8 5d^1 6s^2$

D. $[Xe]4f^6 5d^1 6s^2$, $[Xe]4f^7 5d^1 6s^2$ and $[Xe]4f^9 6s^2$

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384. Draw lewis dot structure of PH_3

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385. The correct order of ionic radii of Y^{3+}, La^{3+}, Eu^{3+} and Lu^{3+} is :

A. $Y^{3+} + < La^{3+} < Eu^{3+} < Lu^{3+}$

B. $Lu^{3+} < Eu^{3+} < La^{3+} + < Y^{3+}$

C. $La^{3+} < Eu^{3+} < Lu^{3+} < Y^{3+}$

D. $Eu^{3+} < La^{3+} < Lu^{3+} < Y^{3+}$

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386. Write ionic equation showing $KMnO_4$ acting as an oxidising agent in acidic medium.

A. H_2SO_4 is a Stronger acid than HCl

B. HCl is oxidized by $KMnO_4$ to Cl_2

C. H_2SO_4 is a dibasic acid

D. rate is faster in the presence of H_2SO_4.

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387. Which of the following pairs of transition metal ion s are the stronger oxidising agents in aqueous solutions?

A. V^{2+} and Cr^{2+}

B. Ti^{2+} and Cr^{2+}

C. Mn^{3+} and Co^{3+}

D. V^{2+} and Fe^{2+}

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388. What is the maximum oxidation state shown by Manganese in its compounds ? Name one such compound ?

A. $+4$

B. $+5$

C. $+6$

D. $+7.$

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389. Write the coordination number of central atom in the following coordination compound : $\left[Co(en)_3\right]^{-3}$

A.

B.

C.

D.

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390. The acidic, basic or amphoteric nature of Mn_2O_7, V_2O_5 and CrO are respectively

A. acidic, acidic and basic

B. basic, amphoteric and acidic

C. acidic, amphoteric and basic

D. acidic, basic and amphoteric

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391. Among the following series of transition metal ions the one where all metal ions have $3d^2$ electronic configuration is

A. Cr

B. Mn

C. Zn

D. Cu

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392. Answer the following: Aqueous solution of Ti^{4+} is colourless, but aqueous solution of Ti^{3+} is violet in colour.

Explain.

A. Ti^{4+}

B. V^{4+}

C. Mn^{2+}

D. Fe^{3+}

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393. The oxidation state of chromium in the final product formed by the reaction between KI and acidified potassium dichromate solution is

A. $+4$

B. $+6$

C. $+2$

D. $+3$

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394. The spin only magnetic moment (in units of Bohr magneton) of

Ni^{2+} would be (At. No. of Ni = 28)

A. 4.90

B. 0

C. 1.73

D. 2.84

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

$\left[Ni(H_2O)_4Cl_2\right]$

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396. Draw lewis dot structure of $SiCl_4$

A.

B.

C.

D.

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397. In context of the lanthanoids, which of the following statement is not correct ?

A. There is a gradual decrease in the radii of the members with increasing atomic number in the series.

B. All the members exhibit +3 oxidation state.

C. Because of Similar Properties the Separation of lanthanoids is not easy.

D. Availability of 4f electrons results in the formation of compounds in +4 State for all the members of the series.

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398. Iron exhibits +2 ang +3 oxidation States. Which of the following Statements about iron is incorrect ?

A. Ferrous compounds are relatively more ionic than the corresponding ferric compounds.

B. Ferrous compounds are less Volatile than the corresponding ferric compounds.

C. Ferrous compounds are more easily hydrolysed than the corresponding ferric compounds.

D. Ferrous oxide is more basic in nature than the ferric oxide.

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399. Four successive members of the first row transition elements are listed below with atomic numbers. Which one of them is expected to have the highest $E^{\circ}_{M^{3+}|M^{2+}}$ value ?

A. Co (Z =27)

B. Cr (Z = 24)

C. Mn (Z = 25)

D. Fe (Z = 26)

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400. Which of the following arrangement does not represent the correct order of the property stated against it?

A. $Sc < Ti < Cr < Mn$: number of oxidation states

B. $Ve^{2+} < Cr^{2+} < Mn^{2+} < Fe^{2+}$: paramagnetic behaviour

C. $Ni^{2+} < Co^{2+} < Fe^{2+} < Mn^{2+}$: ionic size

D. $Co^{3+} < Fe^{3+} < Cr^{3+} < Sc^{3+}$:Stability in aqueous solution

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401. Which series of rections correctly represents chemical reactions related to iron and its compound ?

A. $Fe \xrightarrow{dil\, H_2SO_4} FeSO_4 \xrightarrow{H_2SO_4 . O_2} Fe_2(SO_4)_3 \xrightarrow{heat} Fe$

B. $Fe \xrightarrow{O_2, heat} FeO \xrightarrow{dil\, H_2SO_4} FeSO_4 \xrightarrow{heat} Fe$

C. $Fe \xrightarrow{Cl_2, heat} FeCl_3 \underset{air}{\xrightarrow{heat}} FeCl_2 \xrightarrow{Zn} Fe$

D. $Fe \xrightarrow{O_2, heat} Fe_3O_4 \xrightarrow{CO, 600^\circ C} FeO \xrightarrow{CO, 700^\circ C} Fe$

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402. The colour of $KMnO_4$ is due to

A. L $\rightarrow$ M charge transfer transition

B. $\sigma \rightarrow \sigma^*$ transition

C. M $\rightarrow$ L charge transfer transition

D. d -d transition

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403. Draw lewis dot structure of SO_3

A.

B.

C.

D.

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404. Mark the correct statement(s). (1) Manganese exhibits +7 oxidation state (2) Zinc forms coloured ions (3) $[CoF_6]^{3-}$ is diamagnetic (4) Sc forms +4 oxidation state (5) Zn exhibits only +2 oxidation state

A. 1 and 2

B. 1 and 5

C. 2 and 4

D. 3 and 4

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405. What is the maximum oxidation state shown by actinoids?

A. $+5$

B. $+4$

C. $+7$

D. $+8$.

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406. $KMnO_4$ gets reduced to

A. K_2MnO_4 in neutral medium

B. MnO_2 in acidic medium

C. Mn^{2+} in alkaline medium

D. MnO_2 in neutral medium

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407. All Cu (II) halides are known except the iodide. The reason for is that

A. iodide is a bulky ion

B. Cu^{2+} oxidizes iodide to iodine

C. Cu^{2+} (aq) has much more negative hydration enthalpy

D. Cu^{2+} ion has smaller size

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408. The transition metal ion that has 'spin-only' magnetic moment

value of 1.73 is

A. Mn^{2+}

B. Fe^{2+}

C. V^{2+}

D. Cu^{2+}

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409. Write a short note on chromyl chloride test.

A. chromic acid

B. lead chromate

C. lead acetate

D. sodium chromate

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410. The bonds present in the structure of dichromate ion are

A. four equivalent Cr - O bonds only

B. Six equivalent Cr -O bonds are one O - O bond

C. six equivalent Cr - O bonds and one Cr - Cr bond

D. six equivalent Cr -O bonds and one Cr - O - Cr bond

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411. Write lewis dot symbol for following elements : carbon

A.

B.

C.

D.

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412. When H_2O_2 is shaken with an acidified solution of $K_2Cr_2O_7$ in presence of ether, the ethereal layer turns blue due to the formation of

A. Cr_2O_3

B. CrO_4^{2-}

C. $Cr_2(SO_4)_3$

D. CrO_5

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413. Draw lewis dot structure of C_2H_4

A.

B.

C.

D.

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414. How would you account for the increasing oxidising power in the series $VO_2^+ < Cr_2O_7^{2-} < MnO_4^-$?

A. $VO_2^+ < Cr_2O_7^{2-} < MnO_4^-$

B. $Cr_2O_7^{2-} < VO_2^+ < MnO_4^-$

C. $Cr_2O_7^{2-} < MnO_4^- < VO_2^+$

D. $MnO_4^- < Cr_2O_7^{2-} < VO_2^+$

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415. Draw lewis dot structure of C_2H_2

A.

B.

C.

D.

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416. Draw the lewis dot structure of $COCl_2$

A.

B.

C.

D.

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417. Which of the following ions has the same number of unpaired electrons as present in V^{3+} ?

A. Ti^{2+}

B. Fe^{3+}

C. Ni^{3+}

D. Cr^{3+}

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418. What is the maximum oxidation state shown by actinoids?

A. U and Np

B. Np and Pu

C. Pu and Am

D. U and Pa

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419. The atomic number of cerium (Ce) is 58. The correct electronic configuration of Ce^{3+} ion is

A. $[Xe]4f^1$

B. $[Kr]4f^1$

C. $[Xe]4f^{13}$

D. $[Kr]4d^1$

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420. The only radioactive element among the lanthanoids is

A. Gadolinium

B. Holmium

C. Promethium

D. Neodynium

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421. Identify a 'Chemical twin' among the following

A. Zr-Ta

B. Nb-Te

C. Hf-Re

D. Nb-Ta

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422. How many grams of potassium dichromate are required to oxidise 20.0 g of Fe^{2+} in $FeSO_4$ to Fe^{3+} if the reaction is

carried out in an acidic medium? Molar masses of $K_2Cr_2O_7$ and $FeSO_4$ are 294 and 152 respectively.

A. 6.45 g

B. 7.45 g

C. 8.45 g

D. 9.45 g

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423. Which of the following statement regarding lanthanides is false?

A. All lanthanides are solid at room temperature

B. Their usual oxidation state is +3

C. They can be separated from one another by ion -exchange method

D. Ionic radii of trivalent lanthanides steadily increase with increase in atomic number.

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424. How is sodium chromate converted into sodium dichromate, in the manufacture of potassium dichromate from chromite ore?

A. By the action of concentrated sulphuric acid

B. By roasting with soda ash

C. By the action of sodium hydroxide

D. By the action of lime stone

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425. Identify the metal that forms colourless compounds.

A. Iron (Z = 26)

B. Chromium (Z = 24)

C. Vanadium (Z = 23)

D. Scandium (Z = 21)

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426. What is the general molecular formula of the products obtained on heating lanthanoids (Ln) with sulphur?

A. LnS

B. $\ln S_3$

C. $\ln_3 S_2$

D. $\ln_2 S_3$

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427. Choose the wrong statement in the following:

A. TiO_2 is used in the pigment industry

B. MnO_2 is used in dry battery cells

C. V_2O_5 catalyses the oxidation of SO, in the manufacture of sulphuric acid

D. The 'silver' UK coins are made of Ag/Ni alloy

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428. In aqueous solution, Cr^{2+} is stronger reducing agent than Fe^{2+}. This is because

A. Cr^{2+} ion is more stable than Fe^{2+}

B. Cr^{3+} ion with d^3 configuration has favourable crystal field stabilisation energy

C. Cr^{3+} has half-filled configuration and hence more stable

D. Fe^{3+} in aqueous solution is more stable than Cr^{3+} .

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429. Choose the correct matching of transition metal ion and magnetic moment from the codes given below: (At. No: Ti= 22, V=23 , Fe=26)

Transition element	Magnetic moment (B.M.)
(A) Titanium (III)	(1) 4.9
(B) Vanadium (II)	(2) 1.73
(C) Iron (II)	(3) 3.87

A. (A) -(2), (B) - (3), (C) -(1)

B. (A) -(2), (B) - (1), (C) -(3)

C. (A) -(1), (B) - (2), (C) -(3)

D. (A) -(1), (B) - (3), (C) -(2)

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430. The bivalent metal ion having maximum paramagnetic bahaviour among the first transition series elements is

A. Mn^{2+}

B. Cu^{2+}

C. Sc^{2+}

D. Cu^{+}

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431. When a brown compound of manganese (A) is treated with HCl it gives a gas (B). The gas taken in excess, reacts with NH_3 ,

to give an explosive compound (C). Identify compounds A, B and C.

A. $A = MnO_2, B = Cl_2, C = NCl_3$

B. $A = MnO, B = Cl_2, C = NH_4Cl$

C. $A = Mn_3O_4, B = Cl_2, C = NCl_3$

D. $A = MnO_3, B = Cl_2, C = NCl_2$

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

A. Mn^{2+} is more stable with high 3rd ionisation energy

B. Mn^{2+} is bigger in size

C. Mn^{2+} has completely filled d-orbitals

D. Mn^{2+} does not exist

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433. When I^- is oxidised by MnO_4^- in alkaline medium, I^- converts into

A. IO_3^-

B. I_2

C. IO_4^-

D. IO^-

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434. Blue solution of $CuSO_4$ on treatment with excess KCN give colourless solution due to the

A. formation of CuCN

B. formation of $Cu(OH)_2$

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

D. Cu^{2+} is reduced by CN^- to Cu^+ which forms the complex $\left[Cu(CN)_4\right]^{3-}$.

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435. Consider a titration of potassium dichromate solution with acidified Mohr's salt solution using diphenylamine as indicator. The number of moles of Mohr's salt required per mole of dichromate is

A. 3

B. 4

C. 5

D. 6

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436. Among the following, The coloured compound is

A. CuCl

B. $K_3[Cu(CN)_4]$

C. CuF_2

D. $[Cu(CH_3CN)_4]BF_4$

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437. The complex showing a spin only magnetic moment of 2.82 B.M. is

A. $Ni(CO)_4$

B. $[NiCl_4]^{2-}$

C. $Ni(PPh_3)_4$

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

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438. The colour of light absorbed by an aqueous solution of $CuSO_4$ is

A. orange-red

B. blue-green

C. yellow

D. violet

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439. Which of the following pairs have almost similar atomic radii ?

A. Nb - Ru

B. Zr - Hf

C. Mo - W

D. Pd - Ag.

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440. Which of the following ions are colourless ?

A. Ti^{3+}

B. Cu^{2+}

C. Cd^{2+}

D. Sc^{3+}

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441. Which of the following ions have same number of unpaired electrons?

A. Ni^{2+}

B. Ti^{2+}

C. V^{3+}

D. Fe^{3+}

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442. Which of the following statements is/are wrong ?

A. Ti^{4+} and Ag^{+} are repelled by magnetic field.

B. Mn^{2+} shows maximum magnetic character among the first transition series.

C. Fe^{2+} is more stable than Mn^{2+} towards oxidation to +3 state.

D. Cr in $Cr_2O_7^{2-}$ ion involves sp^3d^3 hybridisation.

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443. In which of the following oxides, the first is not more acidic than the second ?

A. Mn_2O_7, Mn_2O_3

B. CrO_2, CrO_3

C. MnO, Mn_3O_4

D. Mn_3O_4, Mn_2O_3 .

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444. Which of the following statements are correct when a mixture of NaCl and $K_2Cr_2O_7$ is generally warmed with conc. H_2SO_4 ?

A. A deep red vapour is obtained

B. The vapour when passed into NaOH solution gives yellow solution of `Na_2CrO_4.

C. Chlorine gas is evolved

D. Chromyl chloride is formed.

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445. Which of the following statements are correct with reference to ferrous and ferric ions ?

A. Fe^{3+} gives brown colour with potassium ferricyanide

B. Fe^{2+} gives blue precipitate with potassium ferricyanide

C. Fe^{3+} gives red colour with potassium thiocyanate

D. Fe^{2+} gives brown colour with ammonium thiocyanate.

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446. Reduction of the metal centre in aqueous permanganate ion involves

A. 3 electrons in neutral medium

B. 6 electrons in neutral medium

C. 3 electrons in alkaline medium

D. 5 electrons in acidic medium.

Watch Video Solution

447. Write lewis dot symbol for following elements : aluminium

A.

B.

C.

D.

Watch Video Solution

448. Which of the following statement(s) is (are) correct when. a mixture

of NaCl and $K_2Cr_2O_7$ is gently warmed with conc. H_2SO_4 ?

A. A deep red vapour is evolved

B. The vapour when passed through NaOH solution, gives a yellow solution.

C. Chlorine gas is also evolved.

D. Chromyl chloride is formed

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449. What happens when potassium dichromate is heated with sodium chloride and conc. H_2SO_4 ?

A. CrO_3

B. CrO_5

C. CrO_2Cl_2

D. $CrOCl_2$

Watch Video Solution

450. The yellow solution (X) is

A. K_2CrO_4

B. `Na_2CrO_4

C. $CrCl_3$

D. $Cr(OH)_3$

Watch Video Solution

451. The bond order between C and C in ethyne according to lewis.

A.

B.

C.

D.

Watch Video Solution

452. Write lewis dot symbol for following elements : silicon

A.

B.

C.

D.

Watch Video Solution

453. The oxidation state of Cr in compound CrO_5 is

A. $+10$

B. $+8$

C. $+6$

D. $+5$.

Watch Video Solution

454. Draw lewis structure of PF_3

A.

B.

C.

D.

Watch Video Solution

455. Draw lewis dot structure of SF_2

A.

B.

C.

D.

Watch Video Solution

456. The atomic numbers of three lanthanide elements X,Y and Z are 65,68 and 70 respectively. The basic character of their hydroxides will decrease as

A. $X > Y > Z$

B. $X > Z > Y$

C. $Z > Y > X$

D. $Z > Y > X$

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457. Ce (Z = 58) and Yb (Z = 70) exhibit stable +4 and +2 oxidation states respectively. This is because

A. Ce^{4+} and Yb^{2+} acquire f^7 configurations

B. Ce^{4+} and Yb^{2+} acquire f^0 configurations

C. Ce^{4+} and Yb^{2+} acquire f^0 and f^{14} configurations

D. Ce^{4+} and Yb^{2+} acquire f^7 and f^{14} configurations

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458. Which of the following statements is not true?

A. $La(OH)_3$ is more basic than $Lu(OH)_3$

B. All f-block elements are radioactive in nature.

C. The principal oxidation state of lanthanides is +3.

D. The size of trivalent lanthanide ions decrease in 4f block series.

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459. Assertion : Tungsten has very high melting point.

Reason : Tungsten is a covalent compound.

A. (a) If both assertion and reason are CORRECT and reason is the correct explanation of the assertion.

B. (b) If both assertion and reason are CORRECT, but reason is NOT THE CORRECT explanation of the assertion.

C. (c) If assertion is CORRECT but reason is INCORRECT.

D. (d) If assertion is INCORRECT but reason is CORRECT.

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460. Assertion : Cuprous salts are diamagnetic.

Reason : Cu has 3d-filled subshell.

A. (a) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.

B. (b) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.

C. (c) Assertion is correct, but reason is wrong statement.

D. (d) Assertion is wrong but reason is correct statement.

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461. Electronic configuration of $Fe^2 +$ .....

Watch Video Solution

462. Why is $La(OH)_3$ more basic than $Lu(OH)_3$?

Watch Video Solution

463. Assertion : $FeCl_3$ reacts with KCNS to give blood red colouration.

Reason : $FeCl_3$ reacts with KCNS to form potassium ferro-ferricyanide.

A. (a) If assertion and reason both are correct and reason is the correct explanation of assertion

B. (b) If assertion and reason both are correct and reason is not the correct explanation of assertion

C. (c) Assertion is correct but reason is incorrect.

D. (d) Assertion is incorrect but reason is correct.

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464. Draw lewis dot structure of SO_2

Watch Video Solution

465. Why Zn^{2+} salts are colourless and Ni2+ salts are coloured?

Watch Video Solution

466. Reason of lanthanoid contraction is :

Watch Video Solution

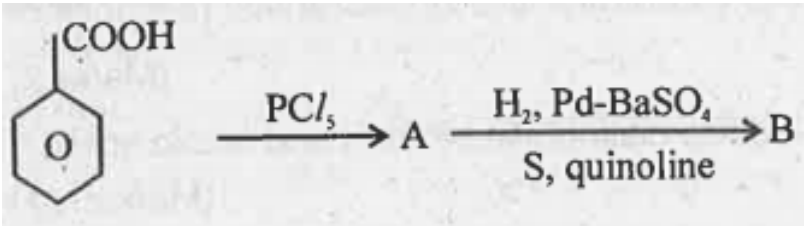
467. Why the actinoids exhibit a large number of oxidation states than the corresponding lanthanoids ?

Watch Video Solution

468. Draw lewis dot structure of F_2O.

Watch Video Solution

469. Complete the following:



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470. Choose the correct option- Bronze alloy has the following composition-

A. Cu and Zn

B. Cu and Sn

C. Cu and Al

D. None of the above

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471. The answer to each of the following questions is a single-digit

-integer ranging from 0 to 9. Darken the correct digit. Acidified $KMnO_4$ oxidises H_2O_2 to H_2O and O_2. The coefficient of

H_2O_2

in the balanced chemical reaction of $KMnO_4$ with H_2O_2 in the presence of dil H_2SO_4 is

0	1	2	3	4	5	6	7	8	9

Watch Video Solution

472. The number of electrons present in the 4f-subshell of Gd (Z = 64) is

0	1	2	3	4	5	6	7	8	9

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473. Draw lewis structure of NCl_3

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474. The number of paramagnetic ions among $Ti^{3+}, Cr^{3+}, Ti^{4+}, Fe^{2+}, Co^{2+}, Zn^{2+}, Cu^{+}, ^{3+}, Mn^{2+}$ is

0	1	2	3	4	5	6	7	8	9

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475. The magnetic moment of a transition metal ion is found to be 4.90 BM. The number of unpaired electrons present in the ion is

0	1	2	3	4	5	6	7	8	9

Watch Video Solution

476. The oxidation number of Mn in the product of alkaline oxidative fusion of MnO_2 is + x. The value of x is

0	1	2	3	4	5	6	7	8	9

Watch Video Solution

477. In neutral or faintly alkaline solution, 8 moles of permanganate anion quantitatively oxidise thiosulphate anions to produce X moles of a sulphur containing product. The magnitude of X is

0	1	2	3	4	5	6	7	8	9

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478. Electronic configuration of a transition element X in +3 oxidation state is $[Ar]3d^5$.What is its atomic number? 25, 26, 27, 24.

A. 25

B. 26

C. 27

D. 24

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479. The electronic configuration of Cu (II) is $3d^9$ whereas that of Cu (I) is $3d^{10}$. Which of the following is correct?

A. Cu (II) is more stable

B. Cu (II) is less stable

C. Cu (I) and Cu (II) are equally stable

D. Stability of Cu (I) and Cu (II) depends on nature of copper salts

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480. Metallic radii of some transition elements given below.

Element	Fe	Co	Ni	Cu
Metallic radii/pm	126	125	125	128

Which of these elements will have highest density ?

A. Fe

B. Ni

C. Co

D. Cu

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481. Generally transition elements form coloured salts due to the presence of unpaired electrons, Which of the following compounds will be coloured in solid state ?

A. Ag_2SO_4

B. CuF_2

C. ZnF_2

D. Cu_2Cl_2

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482. On addition of small amount of $KMnO_4$ to concentrated H_2SO_4, a green oily compound is obtained which is highly explosive in nature. Identify the compound from the following.

A. Mn_2O_7

B. MnO_2

C. $MnSO_4$

D. Mn_2O_3 .

Watch Video Solution

483. The magnetic nature of elements depend on the presence of unpaired electrons. Identify the configuration of transition element,which shows highest magnetic moment.

A. $3d^7$

B. $3d^5$

C. $3d^8$

D. $3d^2$

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484. Which of following oxidation state is common for all lanthanide ?

A. $+2$

B. $+3$

C. $+4$

D. $+5$.

Watch Video Solution

485. Calculate the formal charge on C in CCl_4

A.

B.

C.

D.

Watch Video Solution

486. Draw lewis structure of ozone

Watch Video Solution

487. There are 14 elements in actinoid series. Which of the following elements does not belong to this series?

A. U

B. Np

C. Tm

D. Fm

Watch Video Solution

488. The number of moles of $KMnO_4$ that will be needed to react with

one mole of sulphite ion acidic solution, is

A. $\frac{2}{5}$

B. $\frac{3}{5}$

C. $\frac{4}{5}$

D. $\frac{1}{5}$

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489. Which of the following is amphoteric oxide? $Mn_2O_7, CrO_3, Cr_2O_3, CrO, V_2O_5, V_2O_4$

A. V_2O_5, Cr_2O_3

B. Mn_2O_7, CrO_3

C. CrO, V_2O_5

D. V_2O_5, V_2O_4

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490. Gadolinium belongs to 4f series. Its atomic number is 64. Which of the following is the correct electronic configuration of gadolinium?

A. $[Xe]4f^7 5d^1 6s^2$

B. $[Xe]4f^6 5d^2 6s^2$

C. $[Xe]4f^8 6d^2$

D. $[Xe]4f^9 5s^1$

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491. Interstitial compounds are formed when small atoms are trapped inside the crystal lattice of metals. Which of the following is not the characteristic property of interstitial compounds ?

A. They have high melting points in comparison to pure metals

B. They are very hard

C. They retain metallic conductivity

D. They are chemically very reactive

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492. Find the magnetic moment of Cr^{2+}

A. 2.87 BM.

B. 3.87 BM.

C. 3.47 BM.

D. 3.57 BM.

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493. When I^- is oxidised by MnO_4^- in alkaline medium, I^- converts into

A. I_2

B. IO^-

C. IO_3^-

D. IO_4^-

Watch Video Solution

494. Which of the following statements is not correct ?

A. Copper liberates hydrogen from acids.

B. In its higher oxidation States, manganese forms stable compounds with oxygen and fluorine.

C. Mn^{3+} and Co^{3+} are oxidising agents in aqueous solution.

D. Ti^{2+} and Cr^{2+} are reducing agents in aqueous Solution.

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495. When acidified $K_2Cr_2O_7$ solution is added to Sn^{2+} salts than Sn^{2+} changes to

A. Sn

B. Sn^{3+}

C. Sn^{4+}

D. Sn^{+}

Watch Video Solution

496. Maximum oxidation number of manganese is in

A. fluorine is more electronegative than Oxygen.

B. fluorine does not Possess d-orbitals

C. fluorine stabilises lower oxidation State

D. in covalent compounds fluorine can form single bond only while oxygen forms double bond.

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497. Why do elements in the same group have similar physical and chemical properties ?

A. both belong to d-block

B. both have same number of electrons

C. both have similar atomic radius

D. both belong to the same group of the periodic table

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498. Write one oxidising reaction of $KMnO_4$ in basic medium.

A. Both HCl and $KMnO_4$ act as oxidising agents.

B. $KMnO_4$oxidises HCl into Cl_2 which is also an oxidising agent.

C. $KMnO_4$ is a weaker oxidising agent than HCl.

D. $KMnO_4$ acts as a reducing agent in the presence of HCl.

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499. Which of the following compounds is not coloured?

A. $KMnO_4$

B. $Ce(SO_4)_2$

C. $TiCl_4$

D. Cu_2Cl_2

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500. Which of the following metallic ions have almost same spin only magnetic moment ?

A. Co^{2+}

B. Cr^{2+}

C. Mn^{2+}

D. V^{2+}

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501. Write the oxidation number of Co : $\left[CoCl_2(en)_2\right]^+$

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502. In which of the following compounds, iron has the lowest oxidation number ?

A. Am

B. Pu

C. U

D. Np

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503. General electronic configuration of actionoids is $[Rn]5f^{1-14}6d^{0-1}7s^2$. Which of the following actionoids have one electron in 6d orbital ?

A. U (Atomic no. 92)

B. Np (Atomic no. 93)

C. Pu (Atomic no. 94)

D. Am (Atomic no.95)

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504. Give one example of Lanthanoid having +2 oxidation state.

A. Ce

B. Eu

C. Yb

D. Ho

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505. Which of the following ions show higher spin only magnetic moment value ?

A. Ti^{3+}

B. Mn^{2+}

C. Fe^{2+}

D. Co^{3+}

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506. Element A has 3 electrons in the outermost shell and element B has 6 electrons in the outermost shell. what is the formula of the compound.

A.

B.

C.

D.

Watch Video Solution

507. Examples of food sources that contain calcium are-

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508. Although +3 is the characteristic oxidation State for lanthanoids but cerium also shows +4 oxidation state because _____ .

A. it has variable ionisation enthalpy

B. it has a tendency to attain noble gas configuration

C. it has a tendency to attain f^0 configuration

D. it resembles Pb^{4+}

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

$[PtCl_6]^{-2}$

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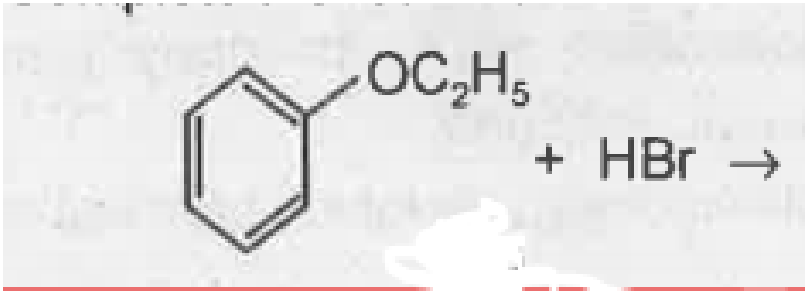
510. Complete the reaction :



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511. Match the properties given in Column I with the metals given in Column II.

Column I (Property)	Column II (Metal)
(a) An element which can show +8 oxidation state	(i) Mn
(b) 3d block element that can show upto +7 oxidation state	(ii) Cr (iii) Os
(c) 3d block element with highest melting point	(iv) Fe

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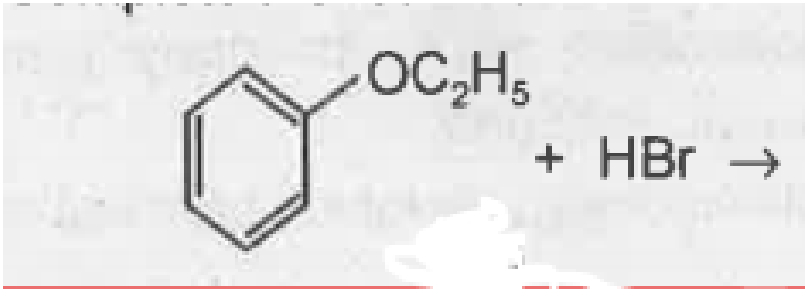
512. Write lewis dot symbol for following elements : scandium

Watch Video Solution

513. Write lewis dot symbol for following elements :helium

Watch Video Solution

514. Complete the reaction :



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515. Draw lewis structure of $SOCl_2$

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516. 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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517. Assertion : Separation of Zr and Hf is difficult. Reason : Because Zr and Hf lie in the same group of the periodic table.

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518. Assertion : Actinoids form relatively less stable complexes as compared to lanthanoids. Reason : Actinoids can utilise their 5f orbitals along with 6d orbitals in bonding but lanthanoids do not use their 4f orbital for bonding.

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519. Assertion : Cu cannot liberate hydrogen from acids. Reason : Because it has positive electrode potential.

Watch Video Solution

520. Assertion : The highest oxidation state of osmium is +8. Reason : Osmium is a 5d-block element.

Watch Video Solution

521. Explain the following observation : Cu^{+} ion is not known in aqueous solutions.

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522. Why is equropium (II) more stable than cerium (II) (Eu = 63, Ce =58) give one reason.

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523. Which ion has maximum size in Lanthanoid series ?

Watch Video Solution

524. Write the general electronic configuration of lanthanoids.

Watch Video Solution

525. Why does Mn(II) shows maximum paramagnetic character among the divalent ions of first transition series ?

Watch Video Solution

526. How would you account for the irregular variation of ionisation enthalpies (first and second) in the first series of the transition elements?

Watch Video Solution

527. Write chemical reaction for preparation of K2Cr207 from chromite ore.

Watch Video Solution

528. What is meant by 'disproportionation'? Give two examples of disproportionation reaction in aqueous solution.

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529. Compare the chemistry of actinides with that of Lanthanides with special reference to oxidation state

Watch Video Solution

530. Compare the chemistry of actinides with that of Lanthanides with special reference to oxidation state

Watch Video Solution

531. Draw lewis structure of SCl_2

Watch Video Solution

532. What are the main consequences of lanthanoid contraction ?

Watch Video Solution

533. Complete the following reaction equation :

$MnO_4^- + Fe^{2+} + H^+ \rightarrow$

Watch Video Solution

534. Complete the following reaction equation :

$MnO_4^- + I^- + H_2O \rightarrow$

Watch Video Solution

535. Show the formation of aluminium flouride.

Watch Video Solution

536. Why do transition metals have high enthalpies of atomization ?

Watch Video Solution

537. How would you account for the following : Of the d^4 species, Cr^{2+} is strongly reducing while Mn(III) is strongly oxidising.

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538. Show the formation of sodium sulphide.

Watch Video Solution

539. Show the formation of sodium phosphide.

Watch Video Solution

540. Show the formation of potassium oxide.

Watch Video Solution

541. Show the formation of potassium chloride.

Watch Video Solution

542. What is the bond order in hydrogen molecule according to lewis .

Watch Video Solution

543. What is the bond order in oxygen molecule according to lewis .

Watch Video Solution

544. The paramagnetic character of first transition series increases upto manganese and then decreases. Explain .

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545. What is the bond order in nitrogen molecule according to lewis

Watch Video Solution

546. Name the third and fourth transition elements of first transition series.

Watch Video Solution

547. What is the theoretical magnetic moment of Ti^{3+} ion ?

Watch Video Solution

548. Which of the two V(+5) or V(+4) is diamagnetic ?

Watch Video Solution

549. Which of the following ions are expected to be coloured ?

$Ni^{2+}, Ti^{3+}, Cu^{+}, Sc^{3+}, Zn^{2+}$

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550. Express 2072 in roman numbers.

Watch Video Solution

551. Out of Fe^{2+} and `Fe^(3+) which is more paramagnetic and why ?

Watch Video Solution

552. Express 2073 in roman numbers.

Watch Video Solution

553. Name any three elements of transition series which have abnormal electronic configurations?

Watch Video Solution

554. Why Zn^{2+} salts are colourless and Ni2+ salts are coloured?

Watch Video Solution

555. A compound has been found to have magnetic moment of 3.9 B.M. How many unpaired electrons does it contain ?

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556. Name the catalyst of Vanadium used for oxidation of SO_2 to SO_3 in contact process.

Watch Video Solution

557. Give reason, Mn^{2+} ion is more paramagnetic than Fe^{2+} ion.

Watch Video Solution

558. What is the oxidation state of Cr in $K_2Cr_2O_7$?

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559. Fill in the blanks : The orange colour of dichromate solution changes to ..... on heating with alkalies due to the formation of..... ions .

Watch Video Solution

560. Fill in the blanks : MnO_2 on heating with potassium hydroxide in the presence of air forms.....

Watch Video Solution

561. Fill in the blanks : Chromite is .....

Watch Video Solution

562. What happens when 28% of copper, 2% of iron and 70% of nickel combine together?

Watch Video Solution

563. What happens when 60% of copper and 40% of nickel combine together?

Watch Video Solution

564. The oxidation state of chromium in dichromate ion $\left(Cr_2O_7^{2-}\right)$ and chromate ion $\left(CrO_4^{2-}\right)$ is

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565. What is the oxidation state of Mn is manganate ion.

Watch Video Solution

566. What is the oxidation state of Cr in CrO_5.

Watch Video Solution

567. Calculate equivalent weight of $KMnO_4$ in acidic medium.

Watch Video Solution

568. Calculate equivalent weight of $KMnO_4$ in alkaline medium.

Watch Video Solution

569. Complete the chemical reaction :

$MnO_4^- + SO_2 + H^+ \rightarrow$

Watch Video Solution

570. Complete the chemical reaction :

$S_2O_3^{2-} + Cr_2O_7^{2-} + H^+ \rightarrow$

Watch Video Solution

571. What happens when 80% of copper combines with 20% of tin?

Watch Video Solution

572. What is chromyl chloride test for chlorides ?

Watch Video Solution

573. Why is $La(OH)_3$ more basic than $Lu(OH)_3$?

Watch Video Solution

574. What is the most common oxidation state in the Lanthanoids ?

Watch Video Solution

575. How many unpaired electrons are present in Gd(Z = 64) ?

Watch Video Solution

576. Name the actinoid used for the manufacture of fine rods for atomic reactors.

Watch Video Solution

577. Arrange $Ce^{3+}(Z=58), Sm^{3+}(Z=62)$ and $Yb^{3+}(Z=70)$ in decreasing order of ionic radii.

Watch Video Solution

578. Name the basic cause of similar atomic radii of Hf and Zr.

Watch Video Solution

579. Does actinoids show actinoid contraction similar to lanthanoid contraction ?

Watch Video Solution

580. Name the trivalent lanthanoid having the configuration $[Xe]4f^7$.

Watch Video Solution

581. Which of the following ion is colourless ?

U^{3+}, Cm^{4+}, Th^{4+}

Watch Video Solution

582. Name two tripositive lanthanoid ions which are colourless.

Watch Video Solution

583. Express 2111 in roman numbers.

Watch Video Solution

584. Express 2112 in roman numbers.

Watch Video Solution

585. Express 2113 in roman numbers.

Watch Video Solution

586. Express 2115 in roman numbers.

Watch Video Solution

587. Express 2116 in roman numbers.

Watch Video Solution

588. True of False : In $Cr_2O_7^{2-}$, all Cr-O bonds are equivalent.

Watch Video Solution

589. True of False : Ti(III) compounds are coloured while Ti (IV) compounds are colourless.

Watch Video Solution

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

Watch Video Solution

591. What is the oxidation state of Cr in CrO_5.

Watch Video Solution

592. True of False : Lanthanide compounds are less basic than actinide compounds.

Watch Video Solution

593. Complete the missing links: In CrO_4^{2-} ion, Cr is ..... hybridised.

Watch Video Solution

594. Write the general electronic configuration of transition elements.

Watch Video Solution

595. What is the most common oxidation state in the Lanthanoids ?

Watch Video Solution

596. What happens when 88% of copper, 10% of tin and 2% of zinc combine together?

Watch Video Solution

597. The chromate ion in acidic medium changes to ..... ion.

Watch Video Solution

598. The formula of chromite is ..... .

Watch Video Solution

599. The most abundant transition metal is ..... .

Watch Video Solution

600. The spin only magnetic moment for ion having d^8 electronic configuration is ..... B.M.

Watch Video Solution

601. When $K_2Cr_2O_7$ is heated to red hot the products are ..... ,..... and ..... .

Watch Video Solution

602. The reddish brown vapours formed when sodium chloride is heated with $K_2Cr_2O_7$ and conc. H_2SO_4 are due to the formation of ..... .

Watch Video Solution

603. The most common mineral containing lanthanoids is ..... .

Watch Video Solution

604. In the first transition series, the maximum number of oxidation states is shown by ..... .

Watch Video Solution

605. What is the theoretical magnetic moment of Ti^{3+} ion ?

Watch Video Solution

606. The colour of light absorbed by an aqueous solution of $CuSO_4$ is

Watch Video Solution

607. Equivalent weight of $K_2Cr_2O_7$ in acidic medium is ..... .

Watch Video Solution

608. CrO_3 is an acidic hydride of ..... .

Watch Video Solution

609. Two lanthanoids ..... and ..... show +4 oxidation states.

Watch Video Solution

610. The formula of Prussion blue is ..... .

Watch Video Solution

611. The actinoid used for manufacture of fine rods for atomic reactors is ..... .

Watch Video Solution

612. The last element in the actinoid series is :

Watch Video Solution

613. Choose the correct alternative: Cerium (Z = 58) exhibits +2/+4 oxidation state.

Watch Video Solution

614. True of False : Lanthanide compounds are less basic than actinide compounds.

Watch Video Solution

615. NO_2^- is oxidised to N_2/NO_3^- by acidified $KMnO_4$.

Watch Video Solution

616. What happens when 95% of copper combine with 4% of tin and 1% of phosphorus?

Watch Video Solution

617. Misch metal alloy contains about 95% lanthanoid/actinoid metals.

Watch Video Solution

618. Baeyer's reagentisalkaline alkaline $KMnO_4$/alkaline $K_2Cr_2O_7$ solution.

Watch Video Solution

619. Ionic radius of $Ce^{3+}(Z=58)$ is less/more than that of $Yb^{3+}(Z=70)$.

Watch Video Solution

620. Number of unpaired electrons in gadolinium (Z = 64) is 8/6.

Watch Video Solution

621. Colour of acidic $K_2Cr_2O_7$ solution is orange / yellow .

Watch Video Solution

622. Mn_2O_3 is acidic/basic oxide.

Watch Video Solution

623. Pt^{4+} is less/more stable than Ni^{4+} .

Watch Video Solution

624. Density of Mn is more/ less than Fe.

Watch Video Solution

625. The number of unpaired electrons in Fe^{3+} ion is:

Watch Video Solution

626. What is the number of unpaired electrons in : Cu^{+} ?

Watch Video Solution

Watch Video Solution

627. Write two examples of mixed oxides and give their equivalent oxides.

Watch Video Solution

628. Name the phenomenon responsible for the similar properties of Zr and Hf Define it.

Watch Video Solution

629. Which metal in the first series of transition metals exhibits +1 oxidation state most frequently and why?

Watch Video Solution

630. Write the iupac name of following : $\left[Co(H_2NCH_2CH_2NH_2)_3\right]_2(SO_4)_3$

Watch Video Solution

631. Write the general electronic configuration of f-block elements.

Watch Video Solution

632. What is the most common oxidation state in the actinoids ?

Watch Video Solution

633. What are lanthanoids ?

Watch Video Solution

634. What are actinoids ?

Watch Video Solution

635. Transition elements

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636. Write the iupac name of following : $Na\left[Ag(NO_2)_2\right]$

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637. Write the iupac name of following : $\left[Pt(NO_2)Cl(H_2O)_4\right]SO_4$

Watch Video Solution

638. Write the iupac name of following : $K_2[HgCl_4]$

Watch Video Solution

639. Why Cd^{2+} salts are white ? Cd=48

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640. What is lanthanoid contraction ?

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641. Write the iupac name of following : $K[PtCl_3(NH_3)]$

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642. The general electronic configuration of the inner transition element is ..... .

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643. Write the general electronic configuration of transition elements.

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644. What is the oxidation state of Cr in $K_2Cr_2O_7$?

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645. $KMnO_4 \xrightarrow{\Delta} ? + MnO_2 + ?$

Watch Video Solution

646. $K_2Cr_2O_7 \xrightarrow{\Delta} ? + ? + ?$

Watch Video Solution

647. Which transition metal can show highest oxidation state ?

A. Sc

B. Ti

C. Os

D. Zn

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648. Which of the following is not an actinoid ?

A. Cerium

B. Californium

C. Uranium

D. Terbium

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649. Which of the following would be diamagnetic :

A. Cu^{2+}

B. Ni^{2+}

C. Cd^{2+}

D. Ti^{3+}

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650. Misch metal is an alloy of

A. La

B. Th

C. Ac

D. none of these

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651. Maximum magnetic moment is shown by

A. $3d^8$

B. $3d^7$

C. $3d^9$

D. $3d^5$

Watch Video Solution

652. Maximum oxidation number of manganese is in

A. K_2MnO_4

B. MnO_2

C. $KMnO_4$

D. Mn_2O_4

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653. Electronic configuration of $Fe^2 +$ .....

A. $[Ar]4s^23d^4$

B. $[Ar]4s^13d^5$

C. $[Ar]3d^6$

D. $[Ar]3d^8$

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654. Write the electronic configuration of $Cr(Z = 24)$.

A. $3d^4 4s^2$

B. $3d^6 4s^0$

C. $3d^5 4s^1$

D. none of these

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655. Increasing order of paramagnetism is

A. $Cu^{2+}, Co^{2+}, Mn^{2+}, Ni^{2+}$

B. $Co^{2+}Cu^{2+}, Mn^{2+}, Ni^{2+}$

C. $Cu^{2+}Ni^{2+}, Co^{2+}Mn^{2+}$

D. $Mn^{2+}, Co^{2+}, Ni^{2+}, Cu^{2+}$

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656. What are transition elements ? Which of the d block elements are not regarded as transition elements and why ?

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657. In what way is the electronic configuration of transition elements different from that of the non-transition elements ?

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658. What is the basic difference between the electronic configurations of transition and inner transition elements ?

Watch Video Solution

659. Why are f-block elements placed at the bottom of the periodic table ? Give the names of the series present in the block.

Watch Video Solution

660. Give an explanation for the following observation : The gradual decrease in size (actinoid contraction) from element to element is greater among the actinoids than that among the lanthanoids (lanthanoid contraction).

Watch Video Solution

661. Give an explanation for the following observation : The greatest number of oxidation states are exhibited by the members in the middle of a transition series.

Watch Video Solution

662. Write the iupac name of following : $[Cr(NO_2)_2(H_2O)_4]NO_3$

Watch Video Solution

663. Explain the following observation : In general, the atomic radii of transition elements decrease with atomic number in a given series.

Watch Video Solution

664. The $E^{\circ}_{M^{2+}/M}$ for copper is positive (0.34 V). Copper is the only metal in the first series of transition elements showing this behaviour.

Watch Video Solution

665. Account for the following : The E° value for the $Mn^{3+} \mid Mn^{2+}$ couple is much more positive than that for

$Cr^{3+} \mid Cr^{2+}$ couple.

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666. Explain the following observation : Cu^{+} ion is not known in aqueous solutions.

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667. 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.

Watch Video Solution

668. Why E^{Θ} values for Mn, Ni and Zn are more negative than expected ?

Watch Video Solution

669. Write chemical reaction for preparation of K2Cr207 from chromite ore.

Watch Video Solution

670. Give oxidation of KI by acidified $K_2Cr_2O_7$.

Watch Video Solution

671. Write the iupac name of following : $\left[Ni(H_2O)_2(NH_3)_4\right]SO_4$

Watch Video Solution

672. What are lanthanoids ? Explain lanthanoid contraction.

Watch Video Solution

673. Why transition elements show catalytic property? Give two examples of it.

Watch Video Solution

674. How would you account for the following? The atomic radii of the metals of the third (5d) series of transition elements are virtually the same as those of the corresponding members of the second (4d) series.

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675. Account for the following : The E° value for the $Mn^{3+} \mid Mn^{2+}$ couple is much more positive than that for $Cr^{3+} \mid Cr^{2+}$ couple.

Watch Video Solution

676. Why is the highest oxidation state of a metal exhibited in its oxide or fluoride only ?

Watch Video Solution

677. Explain the following observation : Cu^+ ion is not known in aqueous solutions.

Watch Video Solution

678. Which of the following exhibits the greatest number of oxidation states?

Watch Video Solution

679. Give an explanation for the following observation : With the same d-orbital configuration $\left(d^4\right)$, Cr^{2+} ion is a reducing agent but Mn^{3+} ion is an oxidising agent.

Watch Video Solution

680. How would you account for the following ? The actinoids exhibit a larger number of oxidation states than the corresponding members in the lanthanoid series.

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681. How would you account for the following ? Most of the transition metal ions exhibit characteristic colours in aqueous solutions.

Watch Video Solution

682. Why enthalpy of atomisation of the transition elements are quite high ?

Watch Video Solution

683. The 4d and 5d series of transition metals have more frequent metal-metal bonding in their compounds than do the 3d transition metals. Explain.

Watch Video Solution

684. Explain the following observation giving an appropriate reason : Mn^{2+} is much more resistant than Fe^{2+} towards oxidation.

Watch Video Solution

685. Complete the following chemical equation :

$Cr_2O_7^{2-}(aq) + Fe^{2+}(aq) + H^+(aq) \rightarrow$

Watch Video Solution

686. Write the iupac name of the compound : $K_2\left[Zn(OH)_4\right]$

Watch Video Solution

687. Complete the following chemical equation :

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

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688. What are interstitial compounds ? Mention their characteristics.

Watch Video Solution

689. Write uses of actinoids.

Watch Video Solution

690. Write one oxidising reaction of $K_2Cr_2O_7$ in Acidic medium.

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691. Write one oxidising reaction of $KMnO_4$ in basic medium.

Watch Video Solution

692. Write the iupac name of the compound : $Hg\left[Co(CNS)_4\right]$

Watch Video Solution

693. Draw the structure of CrO_4^{2-} .

Watch Video Solution

694. Write the oxidation of H_2S by acidified $KMnO_4$.

Watch Video Solution

695. Lanthanoids are much more paramagnetic than transition elements. Explain.

Watch Video Solution

696. Draw the structure of $Cr_2O_7^{2-}$.

Watch Video Solution

697. Write the reaction of potassium iodide with acidified potassium dichromate.

Watch Video Solution

698. How does permanganate solution react with Fe(II) ions? Write balanced ionic equations for the reaction.

Watch Video Solution

699. Transition elements and their compounds are found to be good catalysts. Give examples.

Watch Video Solution

700. What is lanthanoid contraction ?

Watch Video Solution

701. Give the preparation of Potassium Permanganate from Pyrolusite ore.

Watch Video Solution

702. Explain with reference to d-block elements: magnetic property.

Watch Video Solution

703. What happens when 88% of copper and 12% of tin combine together?

Watch Video Solution

704. What are inner transition elements? Why are they so called?

Watch Video Solution

705. Why are there only 14 elements in the lanthanoid series?

Watch Video Solution

706. How does $KMnO_4$ act as a powerful oxidizing agent in neutral, alkaline or acidic medium ?

Watch Video Solution

707. Discuss the general properties of transition elements with reference to elements of 3d- series.

Watch Video Solution

708. Explain the following: Why do transition metals form alloys readily?

Watch Video Solution

709. Why separation of lanthanoid elements is difficult ?

Watch Video Solution

710. Zn and Cd are not normally considered as transition metals. Why ?

Watch Video Solution

711. Why Zr and Hf exhibit similar properties ?

Watch Video Solution

712. Fe^{3+} is more stable than Fe^{2+} . Explain.

Watch Video Solution

713. Explain :Transition elements exhibit variable oxidation states.

Watch Video Solution

714. Express 1036 in roman numbers.

Watch Video Solution

715. Complete the following chemical equation : $KMnO_4 \xrightarrow{513K}$

Watch Video Solution

716. Complete the following chemical equation : $MnO_2 + KOH + O_2 \rightarrow$

Watch Video Solution

717. Does actinoids show actinoid contraction similar to lanthanoid contraction ?

Watch Video Solution

718. Transition metals form mostly coloured compounds.Explain.

Watch Video Solution

719. Complete the following chemical equation : $MnO_4^- + NO_2^- + H^+ \rightarrow$

Watch Video Solution

720. Give the preparation of Potassium Permanganate from Pyrolusite ore.

Watch Video Solution

721. Explain how the colour of a solution of $K_2Cr_2O_7$ depends on the pH of the solution ?

Watch Video Solution

722. Explain, giving reasons, which one of the following pairs exhibits the property indicated : Sc^{3+} or Cr^{3+} exhibits paramagnetism .

Watch Video Solution

723. Explain, giving reasons, which one of the following pairs exhibits the property indicated : V or Mn, which one exhibits more number of oxidation states.

Watch Video Solution

724. Give one method of Preparation of $K_2Cr_2O_7$ from sodium chromate.

Watch Video Solution

725. Why is Cu considered to be a transition element and Zn not ?

Watch Video Solution

726. Explain the following observation : Cu^+ ion is not known in aqueous solutions.

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727. State what happens when a solid mixture of KCl and $K_2Cr_2O_7$ is heated with conc. sulphuric acid. Give balanced chemical equation.

Watch Video Solution

728. Name the element showing maximum number of oxidation states among the first series of transition metals from Sc(Z = 21) to Zn (Z = 30).

Watch Video Solution

729. Explain the following observation giving an appropriate reason : Mn^{2+} is much more resistant than Fe^{2+} towards oxidation.

Watch Video Solution

730. Write the name of metal which shows only +3 oxidation state.

Watch Video Solution

731. What is lanthanoid contraction ?

Watch Video Solution

732. Give the general electronic configuration of

d-block elements.

Watch Video Solution

733. Out of Fe^{2+} and `Fe^(3+) which is more paramagnetic and

why ?

Watch Video Solution

734. What is Actinoid contraction ? Explain it.

Watch Video Solution

735. What arecoinage metals ?

Watch Video Solution

736. What are transition elements ? Which of the d block elements are not regarded as transition elements and why ?

Watch Video Solution

737. Most of transition metals show variable oxidation states. Explain

Watch Video Solution

738. Give the cause of Lanthanide Contraction.

Watch Video Solution

739. What is Misch metal ?

Watch Video Solution

740. What is Lanthanide contraction ? What is the cause and consequences of Lanthanide contraction ?

Watch Video Solution

741. $La(OH)_3$ is more basic than $Lu(OH)_3$. Explain.

Watch Video Solution

742. Answer the following: Aqueous solution of Ti^{4+} is colourless, but aqueous solution of Ti^{3+} is violet in colour.

Explain.

Watch Video Solution

743. Answer the following: Copper (I) has d^{10} configuration while copper (II) has d^9 configuration, still copper (II) is more stable in aqueous solution than copper (I). Why?

Watch Video Solution

744. What are lanthanoids ?

Watch Video Solution

745. Give the chemical equation for the reaction between a saturated solution of sodium dichromate and potassium

chloride .

Watch Video Solution

746. A mixed oxide of iron and chromium, $FeO.Cr_2O_3$ is fused with sodium carbonate in the presence of air to form a yellow compound (A). On acidification, the compound (A) forms an orange coloured compound (B) which is a strong oxidising agent. Identify the compounds (A) and (B) .

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747. A mixed oxide of iron and chromium, $FeO.Cr_2O_3$ is fused with sodium carbonate in the presence of air to form a yellow compound (A). On acidification, the compound (A) forms an

orange coloured compound (B) which is a strong oxidising agent. Identify the compounds (A) and (B) .

Watch Video Solution

748. Complete the following chemical equation :

$8MnO_4^- + 3S_2O_3^{2-} + H_2O \rightarrow$

Watch Video Solution

749. Complete the following reaction equation :

$Cr_2O_7^{2-} + Sn^{2+} + H^+ \rightarrow$

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750. Account for the following: Mn shows the highest oxidation state of +7 with oxygen but with fluorine it shows the highest oxidation state of +4.

Watch Video Solution

751. Give reasons: Transition metals show variable oxidation states.

Watch Video Solution

752. Give reasons: Actinoids show irregularities in their electronic configurations.

Watch Video Solution

753. Transition elements and their compounds are found to be good catalysts. Give examples.

Watch Video Solution

754. How would you account for the following? The atomic radii of the metals of the third (5d) series of transition elements are virtually the same as those of the corresponding members of the second (4d) series.

Watch Video Solution

755. How would you account for the following: There is a greater range of oxidation states among the actinoids than among the lanthanoids.

Watch Video Solution

756. Complete the following chemical equation :

$MnO_4^-(aq) + S_2O_3^{2-}(aq) + H_2O(l) \rightarrow$

Watch Video Solution

757. Complete the following chemical equation :

$Cr_2O_7^{2-}(aq) + Fe^{2+}(aq) + H^+(aq) \rightarrow$

Watch Video Solution

758. Explain the following observation : Cu^+ ion is not known in aqueous solutions.

Watch Video Solution

759. Which of the 3d-series of transition elements exhibits the largestn number of oxidation states and why ?

Watch Video Solution

760. How would you account for the following ? Cr^{2+} is stronger reducing agent than Fe^{2+}.

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761. How would you account for the following ? In a transition series of metals, the metal which exhibits the greatest number of oxidation states occurs in the middle of the series.

Watch Video Solution

762. How would you account for the following ? Metal-metal bonding is more frequent in 4d or 5d series of transition metals than in the 3d series .

Watch Video Solution

763. Among lanthanoids, Ln (III) compounds are predominant. However, occasionally in solutions on in solid compounds, + 2 and +4 ions are also obtained.

Watch Video Solution

764. The $E^{\circ}_{M^{2+}/M}$ for copper is positive (0.34 V). Copper is the only metal in the first series of transition elements showing this behaviour.

Watch Video Solution

765. How would you account for the following? The atomic radii of the metals of the third (5d) series of transition elements are virtually the same as those of the corresponding members of the second (4d) series.

Watch Video Solution

766. Transition metals form number of interstitial compounds. Explain.

Watch Video Solution

767. Explain the following observation : There is a general increase in density from titanium (Z = 22) to copper (Z = 29).

Watch Video Solution

768. Why the actinoids exhibit a large number of oxidation states than the corresponding lanthanoids ?

Watch Video Solution

769. Why do the transition elements have higher enthalpies of atomisation? In 3d series (Sc to Zn), which element has the lowest enthalpy of atomisation and why?

Watch Video Solution

770. How would you account for the following: The chemistry of actinoids is more complicated as compared to lanthanoids.

Watch Video Solution

771. Why do transition metals form complexes ?

Watch Video Solution

772. Express 2118 in roman numbers.

Watch Video Solution

773. Write chemical reaction for preparation of K2Cr207 from chromite ore.

Watch Video Solution

774. Transition metals form number of interstitial compounds. Explain.

Watch Video Solution

775. Compare the chemistry of actinides with that of the lanthanoids with special reference to electronic Configuration.

Watch Video Solution

776. Compare the chemistry of actinides with that of Lanthanides with special reference to oxidation state

Watch Video Solution

777. Compare the chemistry of actinides with that of the lanthanides with special reference to chemical reactivity.

Watch Video Solution

778. Compare the chemistry of actinides with that of the lanthanides with special reference to atomic and ionic sizes.

Watch Video Solution

779. Compare the chemistry of actinides with that of Lanthanides with special reference to oxidation state

Watch Video Solution

780. How do you prepare: K_2MnO_4 from MnO_2 ?

Watch Video Solution

781. How do you prepare: $Na_2Cr_2O_7$ from Na_2CrO_4 ?

Watch Video Solution

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

Watch Video Solution

783. Account for the following : The enthalpy of atomization is lowest for Zn in 3d series of the transition elements.

Watch Video Solution

784. How would you account for the following: There is a greater range of oxidation states among the actinoids than among the lanthanoids.

Watch Video Solution

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

Watch Video Solution

786. Which transition metal of 3d series has positive $E^{\circ}_{M^{2+}|M}$ value and why ?

Watch Video Solution

787. Why Cr^{2+} is strongly reducing while Mn^{3+} is strongly oxidising ?

Watch Video Solution

788. Name a member of the lanthanoid series which is well known to exhibit +2 oxidation state.

Watch Video Solution

789. Express 2120 in roman numbers.

Watch Video Solution

790. Out of Cu^{2+} and Cu^{+} ion, which one is colourless and why?

Watch Video Solution

791. What is lanthanoid contraction? Explain Any two consequences of lanthanoid contraction.

Watch Video Solution

792. The ionisation energies of 6d elements are Greater than 3d elements. Give reason.

Watch Video Solution

793. Express 2121 in roman numbers.

Watch Video Solution

794. Express 1202 in roman numbers.

Watch Video Solution

795. Express 2123 in roman numbers.

Watch Video Solution

796. Express 2125 in roman numbers.

Watch Video Solution

797. Explain why $\left[Ti(H_2O)_6\right]^{3+}$ is violet while $\left[Ti(H_2O)_6\right]^{4+}$ is colourless.

Watch Video Solution

798. Transition metals form alloys with other transition metals. Explain.

Watch Video Solution

799. What are the main consequences of lanthanoid contraction ?

Watch Video Solution

800. What happens when $K_2Cr_2O_7$ reacts with NaCl in the presence of conc. H_2SO_4.

Watch Video Solution

801. What happens when Acidified $KMnO_4$ reacts with H_2S ?

Watch Video Solution

802. Explain why $TiCl_3$ is coloured but $TiCl_4$ is colourless ?

Watch Video Solution

803. Why transition metals show catalytic properties?

Watch Video Solution

804. Why do lanthanoids have very similar chemical reactivity?

Watch Video Solution

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

Watch Video Solution

806. Why transition elements form a large number of alloys ?

Watch Video Solution

807. Express 2126 in roman numbers.

Watch Video Solution

808. What are the main consequences of lanthanoid contraction ?

Watch Video Solution

809. Why transition metals show catalytic properties?

Watch Video Solution

810. Express 2127 in roman numbers.

Watch Video Solution

811. Why is + 4 oxidation state of titanium more stable than its +3 state? (Z = 22)

Watch Video Solution

812. Express 2128 in roman numbers.

Watch Video Solution

813. Give the comparison of lanthanides and actinides.

Watch Video Solution

814. Express 210 in roman numbers.

Watch Video Solution

815. Express 2131 in roman numbers.

Watch Video Solution

816. Express 2132 in roman numbers.

Watch Video Solution

817. Express 2133 in roman numbers.

Watch Video Solution

818. Express 2135 in roman numbers.

Watch Video Solution

819. Why transition element show coloured Ions ? Explain.

Watch Video Solution

820. Out of Cu^{+} and $V^{+}2$ which will be coloured and why ? (Atomic number Of V is 23 and Cu is 29).

Watch Video Solution

821. Why +3 oxidation state of Fe (Z = 26) is more stable than its +2 oxidation state ?

Watch Video Solution

822. Is Au (Z = 79) a transition metal or not ? Explain.

Watch Video Solution

823. Transition metals formlarge number of complex compounds.Explain.

Watch Video Solution

824. Express 2137 in roman numbers.

Watch Video Solution

825. Why the actinoids exhibit a large number of oxidation states than the corresponding lanthanoids ?

Watch Video Solution

826. Transition elements and their compounds are found to be good catalysts. Give examples.

Watch Video Solution

827. Complete the following chemical equation : $Cr_2O_7^{2-}(aq) + H_2S(g) + H^+(aq) \rightarrow$

Watch Video Solution

828. Complete the following chemical equation :

$Cu^{2+}(aq) + I^{-}(aq) \rightarrow$

Watch Video Solution

829. How would you account for the following ? The oxidising power of oxoanions are in the order

$VO_2^+ < Cr_2O_7^{2-} < MnO_4^-$.

Watch Video Solution

830. How would you account for the following ? The third ionization enthalpy of manganese (Z = 25) is exceptionally high.

Watch Video Solution

831. How would you account for the following ? Cr^{2+} is stronger reducing agent than Fe^{2+}.

Watch Video Solution

832. Complete the following chemical equation : $MnO_4^-(aq) + S_2O_3^{2-}(aq) + H_2O(l) \rightarrow$

Watch Video Solution

833. Complete the following chemical equation : $Cr_2O_7^{2-}(aq) + Fe^{2+}(aq) + H^+(aq) \rightarrow$

Watch Video Solution

834. Explain the following observation : La^{3+} (Z =57) and Lu^{3+} (Z = 71) do not show any colour in solutions.

Watch Video Solution

835. Explain the following observation : Among the divalent cations in the first series of transition elements, manganese exhibits the maximum paramagnetism .

Watch Video Solution

836. Explain the following observation : Cu^{+} ion is not known in aqueous solutions.

Watch Video Solution

837. Give reason for the following : Mn^{3+} is a good oxidising agent.

Watch Video Solution

838. Give reason for the following : $E^{\circ}_{M^{2+}|M}$ values are not regular for first row transition metals (3d series).

Watch Video Solution

839. Express 2138 in roman numbers.

Watch Video Solution

840. Express 2150 in roman numbers.

Watch Video Solution

841. What is gypsum?

Watch Video Solution

842. Express 2151 in roman numbers.

Watch Video Solution

843. Why do transition elements show variable oxidation states ? Name the element showing maximum number of oxidation states among the first series of transition metals from Sc (Z = 21) to Zn (Z= 30).

Watch Video Solution

844. What is lanthanoid contraction ? Name an important alloy which contains some of the lanthanoid metals.

Watch Video Solution

845. Complete the following equation : $Cr_2O_7^{2-} + 2OH^- \rightarrow$

Watch Video Solution

846. Complete the following equation : $MnO_4^- + 4H^+ + 3e^- \rightarrow$

Watch Video Solution

847. Account for the following : Zn is not considered as a transition element.

Watch Video Solution

848. Express 2152 in roman numbers.

Watch Video Solution

849. Express 2153 in roman numbers.

Watch Video Solution

850. Express 2155 in roman numbers.

Watch Video Solution

851. Name a member of the lanthanoid series which is well known to exhibit +4 oxidation state.

Watch Video Solution

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

Watch Video Solution

853. Out of Mn^{3+} and Cr^{3+} which is more paramagnetic and why ? (Atomic nos. Mn = 25, Cr = 24)

Watch Video Solution

854. Account for the following: Mn shows the highest oxidation state of +7 with oxygen but with fluorine it shows the highest oxidation state of +4.

Watch Video Solution

855. Why Zr and Hf exhibit similar properties ?

Watch Video Solution

856. Why transition metals show catalytic properties?

Watch Video Solution

857. Complete the following chemical equation : $MnO_2 + KOH + O_2 \rightarrow$

Watch Video Solution

858. Complete the following chemical equation : $Cr_2O_7^{2-} + H^+ + I^- \rightarrow$

Watch Video Solution

859. The elements of 3d transition series are given as: Sc Ti V Cr Mn Fe Co Ni Cu Zn Answer the following: Write the element which is not regarded as an transition element. Give reason.

Watch Video Solution

860. The elements of 3d transition series are given as: Sc Ti V Cr Mn Fe Co Ni Cu Zn Answer the following: Which element has the highest m.p?

Watch Video Solution

861. Express 2156 in roman numbers.

Watch Video Solution

862. The elements of 3d transition series are given as: Sc Ti V Cr Mn Fe Co Ni Cu Zn Answer the following: Write the element which can show an oxidaition state of +1.

Watch Video Solution

863. Raghav was returning with his family from a marriage party. On the way, a traffic policeman stopped their car. He asked Raghav's father who was driving the car to exhale his breath into an instrument to check whether he has drunk or not. After checking from the instrument, he allowed them to go. As a student of chemistry: Can you explain the theory behind this test ?

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864. Raghav was returning with his family from a marriage party. On the way, a traffic policeman stopped their car. He asked Raghav's father who was driving the car to exhale his breath into an instrument to check whether he has drunk or not. After checking from the instrument, he allowed them to go.

As a student of chemistry: Name the instrument used by the traffic policeman.

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865. Express 2158 in roman numbers.

Watch Video Solution

866. Express 2157 in roman numbers.

Watch Video Solution

867. The decomposition of potassium chlorate $(KClO_3)$ is a slow process. But the decomposition becomes fast in the

presence of a black powder. Answer the following question : What is black powder?

Watch Video Solution

868. The decomposition of potassium chlorate $(KClO_3)$ is a slow process. But the decomposition becomes fast in the presence of a black powder. Answer the following question : What is black powder?

Watch Video Solution

869. The decomposition of potassium chlorate $(KClO_3)$ is a slow process. But the decomposition becomes fast in the presence of a black powder. Answer the following question :

Can you name the substance which can slow down the decomposition of H_2O_2 ?

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870. Zinc is a transition element and has many useful applications. The presence of zinc in trace amounts is essential in humans and many animals. Answer the following question : What is the role of zinc in the body of humans and animals?

Watch Video Solution

871. Zinc is a transition element and has many useful applications. The presence of zinc in trace amounts is essential in humans and many animals. Answer the following question : A

compound of zinc is used as a rodent poison. Name the compound.

Watch Video Solution

872. Zinc is a transition element and has many useful applications. The presence of zinc in trace amounts is essential in humans and many animals. Answer the following question : Name the compound of zinc used in paints.

Watch Video Solution

873. Express 2160 in roman numbers.

Watch Video Solution

874. Give and justify the electronic configuration of copper and chromium.

A. $[Ar]3d^9 4s^2$

B. $[Ar]3d^{10} 4s^1$

C. $[Ar]3d^8 4s^2$

D. $[Ar]3d^{10} 4s^2$

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875. Express 2161 in roman numbers.

Watch Video Solution

876. Express 2162 in roman numbers.

Watch Video Solution

877. Express 2163 in roman numbers.

Watch Video Solution

878. In which of the following ions, the colour is not due to d-d transition ?

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

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

C. $[CoF_6]^{3-}$

D. CrO_4^{2-} .

Watch Video Solution

879. Percentage of gold in 18 carat gold is:

A. 0.3867

B. $75.0\ \%$

C. $80.0\ \%$

D. $20.0\ \%$

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880. Express 2165 in roman numbers.

Watch Video Solution

881. Express 2166 in roman numbers.

Watch Video Solution

882. Which of the following is an acidic oxide ?

A. Mn_2O_7

B. Mn_3O_4

C. MnO

D. Mn_2O_3 .

Watch Video Solution

883. Which of the following ions has smallest radius ?

A. Mn^{2+}

B. Ni^{2+}

C. Ti^{2+}

D. V^{2+}

Watch Video Solution

884. Which of the following is the strongest base ?

A. $Sc(OH)_3$

B. $La(OH)_3$

C. $Lu(OH)_3$

D. $Yb(OH)_3$.

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885. Zr and Hf have same atomic and ionic radii because

A. of diagonal relationship

B. of lanthanoid contraction

C. of actinoid contraction

D. both belong to f-block of elements.

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886. What is the equivalent weight of $KMnO_4$ in acidic medium is equal to:

A. $\frac{Mol.\ wt.}{3}$

B. $\frac{Mol.\ wt.}{5}$

C. $\frac{Mol.\ wt.}{2}$

D. Mol. wt.

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887. Which metal has lowest melting point? Cs Hg Mn Cu

A. Cs

B. He

C. Mn

D. Cu.

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888. The maximum oxidation state of Os is ?

A. $+6$

B. $+7$

C. $+5$

D. $+8$.

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889. Express 2167 in roman numbers.

Watch Video Solution

890. Express 2168 in roman numbers.

Watch Video Solution

891. $KMnO_4$ on heating gives

A. K_2MnO_4, Mn_2O_3

B. K_2MnO_4, MnO, O_2

C. K_2MnO_4, MnO_2, O_2

D. K_2MnO_4, MnO_2, O_3

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892. Chromyl chloride is :

A. CrO_2Cl_2

B. $CrOCl_2$

C. $CrCl_3$

D. Cr_2OCl_2

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893. Express 2170 in roman numbers.

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894. In the reaction : $CrO_4^{2-} + X \rightarrow$ Cr_2O_7^(2-)`, X is

A. OH^-

B. H_2O

C. H^+

D. O_2

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895. In which of the following pairs, the atomic size is almost the same ?

A. La - Ce

B. Nb - Ta

C. Zn - Hf

D. Nb - Zr.

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896. The hybridisation of Cr in $Cr_2O_7^{2-}$ ion is

A. sp^3d

B. sp^3d^2

C. sp^3

D. sp^2 .

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897. In alkaline medium, equivalent weight of $KMnO_4$ is ,

A. 31.6

B. 52.67

C. 79

D. 158

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898. What is lanthanoid contraction ?

A. Zr and Y have about the same radius

B. Zr and Nb have similar oxidation state

C. Zr and Hf have about the same radius

D. Zr and Zn have the same oxidation state.

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899. In acidic medium the equivalent weight of $K_2Cr_2O_7$, is :

A. M

B. M/2

C. M/3

D. M/6.

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900. Ammonium dichromate is used in fireworks. The green coloured powder blown in air is

A. CrO_3

B. Cr_2O_3

C. Cr

D. $CrO(O_2)$

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901. The number of moles of $KMnO_4$ that will be needed to react with

one mole of sulphite ion acidic solution, is

A. $2/5$

B. $3/5$

C. $4/5$

D. 1

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902. The number of unpaired electrons in Ni^{2+} is :

A. Zero

B. 2

C. 4

D. 8

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903. The electronic configuration of terbium (IV) (At. No. 65) is

A. $[Xe]4f^5 6s^2$

B. $[Xe]4f^7 6s^0$

C. $[Xe]4f^8 6s^0$

D. $[Xe]4f^7 6s^2$

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904. Which of the following statement is not correct ?

A. $La(OH)_3$ is less basic than $Lu(OH)_3$

B. In lanthanoid series, ionic radius decreases from a La^{3+} to Lu^{3+} ion.

C. La is actually an element of transition series rather than lanthanoids

D. Atomic radius of Zr and Hf are same because of lanthanoid contraction.

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905. In the standardisation of $Na_2S_2O_3$ using $K_2Cr_2O_7$ by iodometry, the equivalent weight of $K_2Cr_2O_7$ is :

A. mol wt/2

B. mol wt/6

C. mol wt/3

D. same as mol wt.

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906. Give-one reaction in each case to show that H_2O_2 is an reducing agent

A. 3, 5, 4 and 1

B. 4, 3, 1 and 5

C. 1, 3, 4 and 5

D. 5, 4, 3 and 1.

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907. The basic character of the transition metal monoxides follows the order :

A. VO gt CrO gt TiO gt FeO

B. CrO gt VO gt FeO gt TiO

C. TiO gt FeO gt VO gt CrO

D. TiO gt VO gt CrO gt FeO.

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908. The correct order of ionic radii of Y^{3+}, La^{3+}, Eu^{3+} and Lu^{3+} is :

A. $Y^{3+} + < La^{3+} < Eu^{3+} < Lu^{3+}$

B. $Y^{3+} < Lu^{3+} + < Eu^{3+} + < La^{3+}$

C. $Lu^{3+} < Eu^{3+} < La^{3+} + < Y^{3+}$

D. `La^(3+) lt Eu^(3+) lt Lu^(3+) lt Y^(3+).

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909. In which of the following pairs, both the ions are coloured in aqueous solutions ? (At. No. Se = 21, Ti = 22, Ni = 28, Co= 27, Cu = 29)

A. Sc^{3+}, Ti

B. Sc^{3+}, Co^{2+}

C. Ni^{2+}, Cu^{+}

D. Ni^{2+}, Ti^{3+}

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910. The number of moles of $KMnO_4$ that will be needed to react with

one mole of sulphite ion acidic solution, is

A. 1

B. $3/5$

C. $4/5$

D. $2/5$

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911. Which one of the following ions will exhibit colour in aqueous solutions

A. Mn^{3+}

B. Cr^{3+}

C. V^{3+}

D. Ti^{3+}

Watch Video Solution

912. The correct order of decreasing second ionisation enthalpy of Ti (22), V (23), Cr (24) and Mn (25)

A. VgtMngtCrgtTi

B. Mn gtCrgtTigtV

C. Tigt VgtCrgtMn

D. CrgtMngtVgtTi

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913. Transition elements exhibit a large number of oxidation states.Explain.

A. $3d^5 4s^1$

B. $3d^5 4s^2$

C. $3d^2 4s^2$

D. $3d^3 4s^2$

Watch Video Solution

914. Which one of the following ions will exhibit colour in aqueous solutions

A. $Lu^{3+}(Z=71)$

B. $Sc^{3+}(Z=21)$

C. $La^{3+}(Z=57)$

D. $Ti^{3+}(Z=22)$

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915. Which of the following pairs has the same size ?

A. Zr^{4+}, Hf^{4+}

B. Zn^{2+}, Hf^{4+}

C. Fe^{2+}, Ni^{2+}

D. Zr^{4+}, Ti^{4+}

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916. Acidified $K_2Cr_2O_7$ solution turns green when $Na - 2SO_3$, is added to it. This is due to the formation of

A. $Cr_2(SO_4)_3$

B. CrO_4^{2-}

C. $Cr_2(SO_3)_3$

D. $CrSO_4$

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917. Write the iupac name of the compound : $K[CrF_4O]$

A.

B.

C.

D.

Watch Video Solution

918. Express 2171 in roman numbers.

Watch Video Solution

919. Express 2172 in roman numbers.

Watch Video Solution

920. Express 2173 in roman numbers.

Watch Video Solution

921. Express 2175 in roman numbers.

Watch Video Solution

922. Express 2176 in roman numbers.

Watch Video Solution

923. Express 2177 in roman numbers.

Watch Video Solution

924. Express 2178 in roman numbers.

Watch Video Solution

925. Express 2180 in roman numbers.

Watch Video Solution

926. Express 2181 in roman numbers.

Watch Video Solution

927. Express 2182 in roman numbers.

Watch Video Solution

928. Express 2183 in roman numbers.

Watch Video Solution

929. Express 2185 in roman numbers.

Watch Video Solution

930. Express 2186 in roman numbers.

Watch Video Solution

931. Express 2187 in roman numbers.

Watch Video Solution

932. Express 2188 in roman numbers.

Watch Video Solution

933. Express 2200 in roman numbers.

Watch Video Solution

934. Express 2201 in roman numbers.

Watch Video Solution

935. Express 2202 in roman numbers.

Watch Video Solution

936. Write the iupac name of the compound : $\left[Pt(NH_3)_2Cl(NO_2)\right]$

A.

B.

C.

D.

Watch Video Solution

937. Which one of the following transition metal ions is colourless in aqueous solution ?

A. Ti^{4+}

B. V^{4+}

C. Mn^{2+}

D. Fe^{3+}

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938. The oxidation state of chromium in the final product formed by the reaction between KI and acidified potassium dichromate solution is

A. $+4$

B. $+6$

C. $+2$

D. $+3$

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939. The spin only magnetic moment (in units of Bohr magneton) of

Ni^{2+} would be (At. No. of Ni = 28)

A. 4.90

B. 0

C. 1.73

D. 2.84

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940. Amount of oxalic acid present in a solution can be determined by its titration with $KMnO_4$ solution in the presence of H_2SO_4. The titration gives unsatisfactory result when carried out in the presence of HCl, because HCl

A. reduces permanganate to Mn^{2+}

B. oxidises oxalic acid to carbon dioxide and water

C. gets oxidised by oxalic acid to chlorine

D. furnishes H^+ ions in addition to those from Oxalic acid.

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941. The correct structure of $Fe(CO)_5$ is

A. FegtMngtCr gt Co

B. CrgtMngtFegt Co

C. MngtCrgtFegtCo

D. CrgtFegtMngtCo.

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942. In context of the lanthanoids, which of the following statement is not correct ?

A. There is a gradual decrease in the radii of the members with increasing atomic number in the series.

B. All the members exhibit +3 oxidation state.

C. Because of Similar Properties the Separation of lanthanoids is not easy.

D. Availability of 4f electrons results in the formation of compounds in +4 State for all the members of the series.

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943. Iron exhibits +2 ang +3 oxidation States. Which of the following Statements about iron is incorrect ?

A. Ferrous compounds are relatively more ionic than the corresponding ferric compounds.

B. Ferrous compounds are less Volatile than the corresponding ferric compounds.

C. Ferrous compounds are more easily hydrolysed than the corresponding ferric compounds.

D. Ferrous oxide is more basic in nature than the ferric oxide.

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944. Four successive members of the first row transition elements are listed below with atomic numbers. Which one of them is expected to have the highest $E^{\circ}_{M^{3+}|M^{2+}}$ value ?

A. Co (Z =27)

B. Cr (Z = 24)

C. Mn (Z = 25)

D. Fe (Z = 26)

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945. Which of the following arrangement does not represent the correct order of the property stated against it?

A. Sclt Ti lt CrltMn : number of oxidation states

B. $Ve^{2+} < Cr^{2+} < Mn^{2+} < Fe^{2+}$: paramagnetic behaviour

C. $Ni^{2+} < Co^{2+} < Fe^{2+} < Mn^{2+}$: ionic size

D. $Co^{3+} < Fe^{3+} < Cr^{3+} < Sc^{3+}$:Stability in aqueous solution

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946. Which series of rections correctly represents chemical reactions related to iron and its compound ?

A. $Fe \xrightarrow{dil\,H_2SO_4} FeSO_4 \xrightarrow{H_2SO_4 . O_2} Fe_2(SO_4)_3 \xrightarrow{heat} Fe$

B. $Fe \xrightarrow{O_2, heat} FeO \xrightarrow{dil\,H_2SO_4} FeSO_4 \xrightarrow{heat} Fe$

C. $Fe \xrightarrow{Cl_2, heat} FeCl_3 \underset{air}{\xrightarrow{heat}} FeCl_2 \xrightarrow{Zn} Fe$

D. $Fe \xrightarrow{O_2, heat} Fe_3O_4 \xrightarrow{CO, 600^\circ C} FeO \xrightarrow{CO, 700^\circ C} Fe$

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947. The colour of $KMnO_4$ is due to

A. L $\rightarrow$ M charge transfer transition

B. $\sigma \rightarrow \sigma^*$ transition

C. M $\rightarrow$ L charge transfer transition

D. d -d transition

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948. MnO_4^- ions are reduced in acidic condition to Mn^{2+} ions whereas they are reduced in neutral condition to MnO_2. The oxidation of 25 ml of a solution X containing Fe^{2+} ions required in acidic condition 20 ml of a solution Y containing

MnO_4^- ions. What volume of solution Y would be required to oxidise 25 ml of solution X containing Fe^{2+} ions in neutral condition ?

A. 11.4 ml

B. 12.0 ml

C. 33.3 ml

D. 35.0 ml

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949. Mark the correct statement(s). (1) Manganese exhibits +7 oxidation state (2) Zinc forms coloured ions (3) $[CoF_6]^{3-}$ is diamagnetic (4) Sc forms +4 oxidation state (5) Zn exhibits only +2 oxidation state

A. 1 and 2

B. 1 and 5

C. 2 and 4

D. 3 and 4

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950. The maximum oxidation state exhibited by actinide ions is

A. $+5$

B. $+4$

C. $+7$

D. $+8$.

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951. $KMnO_4$ gets reduced to

A. K_2MnO_4 in neutral medium

B. MnO_2 in acidic medium

C. Mn^{2+} in alkaline medium

D. MnO_2 in neutral medium

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952. All Cu (II) halides are known except the iodide. The reason for is that

A. iodide is a bulky ion

B. Cu^{2+} oxidizes iodide to iodine

C. Cu^{2+} (aq) has much more negative hydration enthalpy

D. Cu^{2+} ion has smaller size

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953. The transition metal ion that has 'spin-only' magnetic moment value of 5.916 is

A. Mn^{2+}

B. Fe^{2+}

C. V^{2+}

D. Cu^{2+}

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954. Write a short note on chromyl chloride test.

A. chromic acid

B. lead chromate

C. lead acetate

D. sodium chromate

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955. The bonds present in the structure of dichromate ion are

A. four equivalent Cr - O bonds only

B. Six equivalent Cr -O bonds are one O - O bond

C. six equivalent Cr - O bonds and one Cr - Cr bond

D. six equivalent Cr -O bonds and one Cr - O - Cr bond

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956. When H_2O_2 is shaken with an acidified solution of $K_2Cr_2O_7$ in presence of ether, the ethereal layer turns blue due to the formation of

A. Cr_2O_3

B. CrO_4^{2-}

C. $Cr_2(SO_4)_3$

D. CrO_5

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957. The reddish brown vapours formed when sodium chloride is heated with $K_2Cr_2O_7$ and conc. H_2SO_4 are due to the formation of ..... .

A. Cl_2

B. CrO_2Cl_2

C. CrO_3

D. H_2CrO_3

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958. How would you account for the increasing oxidising power in the series $VO_2^+ < Cr_2O_7^{2-} < MnO_4^-$?

A. $VO_2^+ < Cr_2O_7^{2-} < MnO_4^-$

B. $Cr_2O_7^{2-} < VO_2^+ < MnO_4^-$

C. $Cr_2O_7^{2-} < MnO_4^- < VO_2^+$

D. $MnO_4^- < Cr_2O_7^{2-} < VO_2^+$

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959. An orange solid A on heating gives a colourless gas B. The gas B in dry conditions is Passed Over heated Ca to give a solid C. The solid C further reacts with water to Produce gas D which forms a blue coloured compound E on reaction with copper

sulphate solution. Identify A, B,C,D,E and give the sequence of reactions involved .

A. $(NH_4)_2Cr_2O_7$ and Cr_2O_3

B. $Na_2Cr_2O_7$ and Cr_2O_3

C. $K_2Cr_2O_7$ and CrO_3

D. $(NH_4)_2CrO_4$ and CrO_3

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960. In neutral or faintly alkaline medium, thiosulphate is quantitatively oxidized by $KMnO_4$ to

A. SO_3^{2-}

B. SO_4^{2-}

C. SO_2

D. SO_5^{2-}

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961. Which of the following ions has the same number of unpaired electrons as present in V^{3+} ?

A. Ti^{3+}

B. Fe^{3+}

C. Ni^{3+}

D. Cr^{3+}

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962. Among the following actinoid pairs, the maximum oxidation states is shown by

A. U and Np

B. Np and Pu

C. Pu and Am

D. U and Pa

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963. The atomic number of cerium (Ce) is 58. The correct electronic configuration of Ce^{3+} ion is

A. $[Xe]4f^1$

B. $[Kr]4f^1$

C. $[Xe]4f^{13}$

D. $[Kr]4d^1$

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964. The only radioactive element among the lanthanoids is

A. Gadolinium

B. Holmium

C. Promethium

D. Neodynium

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965. Identify a ‘Chemical twin' among the following

A. Zr-Ta

B. Nb-Te

C. Hf-Re

D. Nb-Ta

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966. How many grams of potassium dichromate are required to oxidise 20.0 g of Fe^{2+} in $FeSO_4$ to Fe^{3+} if the reaction is carried out in an acidic medium? Molar masses of $K_2Cr_2O_7$ and $FeSO_4$are 294 and 152 respectively.

A. 6.45 g

B. 7.45 g

C. 8.45 g

D. 9.45 g

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967. Which of the following statement regarding lanthanides is false?

A. All lanthanides are solid at room temperature

B. Their usual oxidation state is +3

C. They can be separated from one another by ion -exchange method

D. Ionic radii of trivalent lanthanides steadily increase with increase in atomic number.

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968. How is sodium chromate converted into sodium dichromate, in the manufacture of potassium dichromate from chromite ore?

A. By the action of concentrated sulphuric acid

B. By roasting with soda ash

C. By the action of sodium hydroxide

D. By the action of lime stone

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969. Identify the metal that forms colourless compounds.

A. Iron (Z = 26)

B. Chromium (Z = 24)

C. Vanadium (Z = 23)

D. Scandium (Z = 21)

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970. What is the general molecular formula of the products obtained on heating lanthanoids (Ln) with sulphur?

A. LnS

B. $\ln S_3$

C. $\ln_3 S_2$

D. $\ln_2 S_3$

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971. Choose the wrong statement in the following:

A. TiO_2 is used in the pigment industry

B. MnO_2 is used in dry battery cells

C. V_2O_5 catalyses the oxidation of SO, in the manufacture of sulphuric acid

D. The 'silver' UK coins are made of Ag/Ni alloy

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972. In aqueous solution, Cr^{2+} is stronger reducing agent than Fe^{2+}. This is because

A. Cr^{2+} ion is more stable than Fe^{2+}

B. Cr^{3+} ion with d^3 configuration has favourable crystal field stabilisation energy

C. Cr^{3+} has half-filled configuration and hence more stable

D. Fe^{3+} in aqueous solution is more stable than Cr^{3+} .

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973. Choose the correct matching of transition metal ion and magnetic moment from the codes given below: (At. No: Ti= 22, V=23 , Fe=26)

Transition element	Magnetic moment (B.M.
(A) Titanium (III)	(1) 4.9
(B) Vanadium (II)	(2) 1.73
(C) Iron (II)	(3) 3.87

A. (A) -(2), (B) - (3), (C) -(1)

B. (A) -(2), (B) - (1), (C) -(3)

C. (A) -(1), (B) - (2), (C) -(3)

D. (A) -(1), (B) - (3), (C) -(2)

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974. The bivalent metal ion having maximum paramagnetic behaviour is

A. Mn^{2+}

B. Cu^{2+}

C. Sc^{2+}

D. Cu^{+}

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975. When a brown compound of manganese (A) is treated with HCl it gives a gas (B). The gas taken in excess, reacts with NH_3 , to give an explosive compound (C). Identify compounds A, B and C.

A. $A = MnO_2, B = Cl_2, C = NCl_3$

B. $A = MnO, B = Cl_2, C = NH_4Cl$

C. $A = Mn_3O_4, B = Cl_2, C = NCl_3$

D. $A = MnO_3, B = Cl_2, C = NCl_2$

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

A. Mn^{2+} is more stable with high 3rd ionisation energy

B. Mn^{2+} is bigger in size

C. Mn^{2+} has completely filled d-orbitals

D. Mn^{2+} does not exist

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977. When I^- is oxidised by MnO_4^- in alkaline medium, I^- converts into

A. IO_3^-

B. I_2

C. IO_4^-

D. IO^-

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978. Blue solution of $CuSO_4$ on treatment with excess KCN give colourless solution due to the

A. formation of CuCN

B. formation of $Cu(OH)_2$

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

D. Cu^{2+} is reduced by CN^- to Cu^+ which forms the complex $\left[Cu(CN)_4\right]^{3-}$.

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979. Consider a titration of potassium dichromate solution with acidified Mohr's salt solution using diphenylamine as indicator.

The number of moles of Mohr's salt required per mole of dichromate is

A. 3

B. 4

C. 5

D. 6

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980. Among the following, The coloured compound is

A. CuCl

B. $K_3[Cu(CN)_4]$

C. CuF_2

D. $\left[Cu(CH_3CN)_4\right]BF_4$

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981. The complex showing a spin only magnetic moment of 2.82 B.M. is

A. $Ni(CO)_4$

B. $[NiCl_4]^{2-}$

C. $Ni(PPh_3)_4$

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

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982. The colour of light absorbed by an aqueous solution of $CuSO_4$ is

A. orange-red

B. blue-green

C. yellow

D. violet

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983. Which of the following pairs have almost similar atomic radii ?

A. Nb - Ru

B. Zr - Hf

C. Mo - W

D. Pd - Ag.

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984. Which of the following ions are colourless ?

A. Ti^{3+}

B. Cu^{2+}

C. Cd^{2+}

D. Sc^{3+}

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985. Which of the following ions have same number of unpaired electrons ?

A. Ni^{2+}

B. Ti^{2+}

C. V^{3+}

D. Fe^{3+}

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986. Which of the following statements is/are wrong ?

A. Ti^{4+} and Ag^{+} are repelled by magnetic field.

B. Mn^{2+} shows maximum magnetic character among the first transition series.

C. Fe^{2+} is more stable than Mn^{2+} towards oxidation to +3 state.

D. Cr in $Cr_2O_7^{2-}$ ion involves sp^3d^3 hybridisation.

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987. In which of the following oxides, the first is not more acidic than the second ?

A. Mn_2O_7, Mn_2O_3

B. CrO_2, CrO_3

C. MnO, Mn_3O_4

D. Mn_3O_4, Mn_2O_3 .

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988. Which of the following statements are correct when a mixture of NaCl and $K_2Cr_2O_7$ is generally warmed with conc. H_2SO_4 ?

A. A deep red vapour is obtained

B. The vapour when passed into NaOH solution gives yellow solution of `Na_2CrO_4.

C. Chlorine gas is evolved

D. Chromyl chloride is formed.

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989. Which of the following statements are correct with reference to ferrous and ferric ions ?

A. Fe^{3+} gives brown colour with potassium ferricyanide

B. Fe^{2+} gives blue precipitate with potassium ferricyanide

C. Fe^{3+} gives red colour with potassium thiocyanate

D. Fe^{2+} gives brown colour with ammonium thiocyanate.

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990. Reduction of the metal centre in aqueous permanganate ion involves

A. 3 electrons in neutral medium

B. 6 electrons in neutral medium

C. 3 electrons in alkaline medium

D. 5 electrons in acidic medium.

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991. The correct statements(s) about Cr^{2+} and Mn^{3+} is (are)

[Atomic numbers of Cr = 24 and Mn = 25]

A. Cr^{2+} is a reducing agent

B. Mn^{3+} is an oxidizing agent

C. both Cr^{2+} and Mn^{3+} exhibit d^4 electronic configuration

D. when Cr^{2+} is used as a reducing agent, the chromium ion attains d^5 electronic configuration.

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992. Which of the following statement(s) is (are) correct when. a mixture

of NaCl and $K_2Cr_2O_7$ is gently warmed with conc. H_2SO_4 ?

A. A deep red vapour is evolved

B. The vapour when passed through NaOH solution, gives a yellow solution.

C. Chlorine gas is also evolved.

D. Chromyl chloride is formed

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993. The yellow solution (X) is

A. CrO_3

B. CrO_5

C. CrO_2Cl_2

D. $CrOCl_2$

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994. The yellow solution (X) is

A. K_2CrO_4

B. `Na_2CrO_4

C. $CrCl_3$

D. $Cr(OH)_3$

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995. Which of the following compounds will give a yellow precipitate with iodine and alkali ?

A. PbS

B. $PbCO_3$

C. $PbCrO_4$

D. $PbSO_4$

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996. The yellow solution (X) is

A. K_2CrO_4

B. $K_2Cr_2O_7$

C. K_2SO_4

D. $(CH_3COO)_2Pb$

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997. The oxidation state of Cr in compound CrO5 is

A. $+10$

B. $+8$

C. $+6$

D. $+5$.

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998. Describe the formation of

Coal

A. Cr^{3+} and O_2

B. CrO_4^{2-} and Cr^{3+}

C. $Cr_2\_7^{2-}$ and Cr^{3+}

D. CrO_3

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999. Why is helium placed in p-block elements although its last electron enters in the s-orbital ?

A. $+3,\ +4$

B. $+2,\ +3,\ +4$

C. $+3,\ +4,\ +5$

D. $+2,\ +3,\ +4+5$

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1000. The atomic numbers of three lanthanide elements X,Y and Z are 65,68 and 70 respectively. The basic character of their hydroxides will decrease as

A. XgtYgtZ

B. XgtZgtY

C. Zgt Ygt X

D. Zgt Ygt X

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1001. Ce (Z = 58) and Yb (Z = 70) exhibit stable +4 and +2 oxidation states respectively. This is because

A. Ce^{4+} and Yb^{2+} acquire f^7 configurations

B. Ce^{4+} and Yb^{2+} acquire f^0 configurations

C. Ce^{4+} and Yb^{2+} acquire f^0 and f^{14} configurations

D. Ce^{4+} and Yb^{2+} acquire f^7 and f^{14} configurations

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1002. Which of the following statements is not true?

A. $La(OH)_3$ is more basic than $Lu(OH)_3$

B. All f-block elements are radioactive in nature.

C. The principal oxidation state of lanthanides is +3.

D. The size of trivalent lanthanide ions decrease in 4f block series.

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1003. The questions given below consist of an Assertion and the Reason. Use the following key to choose the appropriate answer : (a) If both assertion and reason are CORRECT and reason is the correct explanation of the assertion. (b) If both assertion and reason are CORRECT, but reason is NOT THE CORRECT explanation of the assertion. (c) If assertion is CORRECT but reason is INCORRECT. (d) If assertion is INCORRECT but reason is CORRECT. (e) If both assertion and reason are INCORRECT. Assertion : Tungsten has very high melting point. Reason : Tungsten is a covalent compound.

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1004. Assertion : Cuprous salts are diamagnetic.

Reason : Cu has 3d-filled subshell.

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1005. Electronic configuration of Fe^{2+} .....

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1006. Assertion : $La(OH)_3$ is less basic than $Lu(OH)_3$.

Reason : Basic character of hydroxides of lanthanoids increase on moving from La^{3+} to Lu^{3+}.

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1007. Assertion : $FeCl_3$ reacts with KCNS to give blood red colouration.

Reason : $FeCl_3$ reacts with KCNS to form potassium ferro-ferricyanide.

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1008. Sodium chloride is used to clear snow from roads. Explain.

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1009. Assertion : Zn^{2+} and Cu^{2+} are colourless. Reason : Both Zn^{2+} and Cu^{2+} contain 3d-filled subshell.

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1010. Assertion : There is a continuous decrease in size among lanthanoids. Reason - Lanthanoids show lanthanoid contraction.

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1011. Assertion : Lanthanoids show a limited number of oxidation states whereas actinoids show a large number of oxidation states. Reason : Energy gap between 4f, 5d and 6s subshells is small whereas that between 5f. 6d and 7s subshells is large.

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1012. Pt^{4+} is less/more stable than Ni^{4+} .

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1013. Match the element in Column I with the property mentioned in Column II

Column I		Column II	
(A)	Actinium	(*p*)	show oxidation state of +4
(B)	Terbium	(*q*)	show oxidation state of +3
(C)	Ytterbium	(*r*)	show oxidation state of +2
(D)	Uranium	(*s*)	are radioactive in nature

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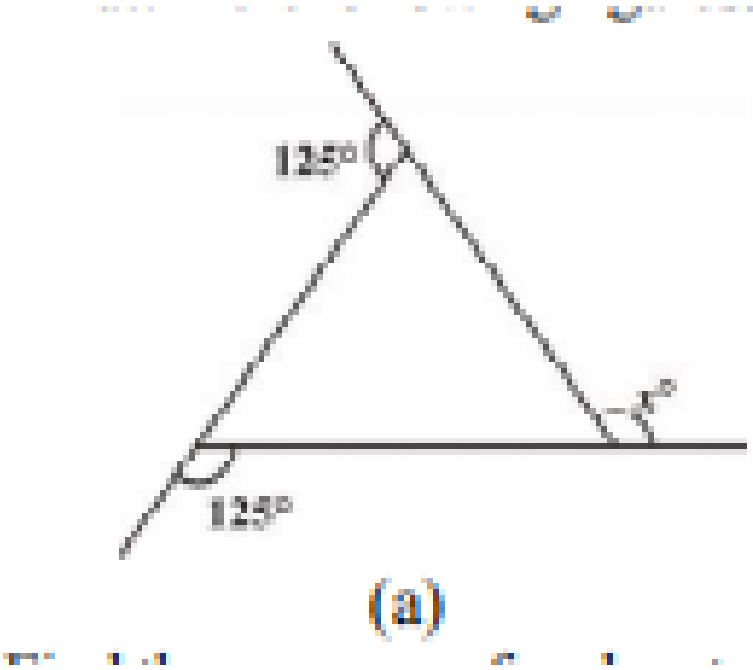
1014. Find x in the following figures.



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1015. The answer to each of the following questions is a single-digit-integer ranging from 0 to 9. Darken the correct digit. Acidified $KMnO_4$ oxidises H_2O_2 to H_2O and O_2. The coefficient of H_2O_2 in the balanced chemical reaction of

$KMnO_4$ with H_2O_2 in the presence of dil H_2SO_4 is

0	1	2	3	4	5	6	7	8	9

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1016. The number of electrons present in the 4f-subshell of Gd (Z = 64) is

0	1	2	3	4	5	6	7	8	9

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1017. Write the iupac name of the compound : $Li[AlH_4]$

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1018. The number of paramagnetic ions among $Ti^{3+}, Cr^{3+}, Ti^{4+}, Fe^{2+}, Co^{2+}, Zn^{2+}, Cu^{+}, ^{3+}, Mn^{2+}$ is

0	1	2	3	4	5	6	7	8	9

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1019. The magnetic moment of a transition metal ion is found to be 4.90 BM. The number of unpaired electrons present in the ion is

0	1	2	3	4	5	6	7	8	9

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1020. The oxidation number of Mn in the product of alkaline oxidative fusion of MnO_2 is + x. The value of x is

0	1	2	3	4	5	6	7	8	9

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1021. In neutral or faintly alkaline solution, 8 moles of permanganate anion quantitatively oxidise thiosulphate anions to produce X moles of a sulphur containing product. The magnitude of X is

0	1	2	3	4	5	6	7	8	9

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1022. Electronic configuration of a transition element X in +3 oxidation state is $[Ar]3d^5$.What is its atomic number? 25, 26, 27, 24.

A. 25

B. 26

C. 27

D. 24

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1023. The electronic configuration of Cu (II) is $3d^9$ whereas that of Cu (I) is $3d^{10}$. Which of the following is correct?

A. Cu (II) is more stable

B. Cu (II) is less stable

C. Cu (I) and Cu (II) are equally stable

D. Stability of Cu (I) and Cu (II) depends on nature of copper salts

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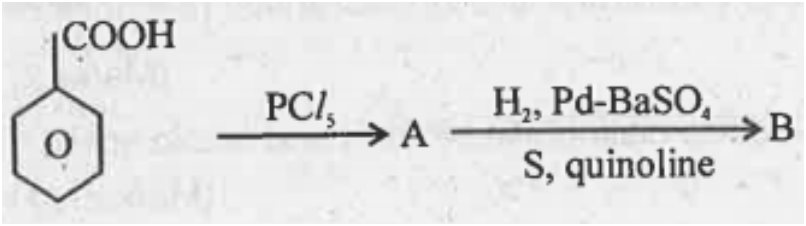
1024. Complete the following:



A. Fe

B. Ni

C. Co

D. Cu

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1025. Generally transition elements form coloured salts due to the presence of unpaired electrons, Which of the following compounds will be coloured in solid state ?

A. Ag_2, SO_4

B. CuF_2

C. ZnF_2

D. Cu_2Cl_2

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1026. On addition of small amount of $KMnO_4$ to concentrated H_2SO_4, a green oily compound is obtained which is highly explosive in nature. Identify the compound from the following.

A. Mn_2O_7

B. MnO_2

C. $MnSO_4$

D. Mn_2O_3 .

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1027. The magnetic nature of elements depends on the presence of unpaired electrons, Identify the configuration of transition element, which shows highest magnetic moment .

A. $3d^7$

B. $3d^5$

C. $3d^8$

D. $3d^2$

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1028. Which of following oxidation state is common for all lanthanide ?

A. $+2$

B. $+3$

C. $+4$

D. $+5$.

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1029. Which of the following reactions are disproportionation reactions ? (i) $Cu^{+} \rightarrow Cu^{2+} + Cu$ (ii) $3MnO_4^{2-} + 4H^{+} \rightarrow 2MnO_4^{-} + MnO_2 + 2H_2O$ (iii) $2KMnO_4 \rightarrow K_2MnO_4 + MnO_2 + O_2$ (iv) $2MnO_4^{-} + 3Mn^{2+} + 2H_2O \rightarrow 5MnO_2 + 4H^{+}$

A. i ,ii

B. i,ii, iii

C. ii, iii, iv

D. i, iv

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1030. The commercial name of calcium sulphate is-

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1031. There are 14 elements in actinoid series. Which of the following elements does not belong to this series?

A. U

B. Np

C. Tm

D. Fm

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1032. The number of moles of $KMnO_4$ that will be needed to react with

one mole of sulphite ion acidic solution, is

A. $\frac{2}{5}$

B. $\frac{3}{5}$

C. $\frac{4}{5}$

D. $\frac{1}{5}$

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1033. Which of the following is amphoteric oxide? $Mn_2O_7, CrO_3, Cr_2O_3, CrO, V_2O_5, V_2O_4$

A. V_2O_5, Cr_2O_3

B. Mn_2O_7, CrO_3

C. CrO, V_2O_5

D. V_2O_5, V_2O_4

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1034. Gadolinium belongs to 4f series. It's atomic number is 64. Which of the following is the correct electronic configuration of gadolinium ?

A. $[Xe]4f^7 5d^1 6s^2$

B. $[Xe]4f^6 5d^2 6s^2$

C. $[Xe]4f^8 6d^2$

D. $[Xe]4f^9 5s^1$

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1035. Interstitial compounds are formed when small atoms are trapped inside the crystal lattice of metals. Which of the following is not the characteristic property of interstitial compounds ?

A. They have high melting points in comparison to pure metals

B. They are very hard

C. They retain metallic conductivity

D. They are chemically very reactive

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1036. The magnetic Moment is associated with its spin angular momentum and orbital angular momentum. Spin only magnetic moment value of Cr^{3+} ion is _____ .

A. 2.87 BM.

B. 3.87 BM.

C. 3.47 BM.

D. 3.57 BM.

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1037. How does $KMnO_4$ act as a powerful oxidizing agent in neutral, alkaline or acidic medium ?

A. I_2

B. IO^-

C. IO_3^-

D. IO_4^-

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1038. Which of the following statements is not correct ?

A. Copper liberates hydrogen from acids.

B. In its higher oxidation States, manganese forms stable compounds with oxygen and fluorine.

C. Mn^{3+} and Co^{3+} are oxidising agents in aqueous solution.

D. Ti^{2+} and Cr^{2+} are reducing agents in aqueous Solution.

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1039. When acidified $K_2Cr_2O_7$ solution is added to Sn^{2+} salts than Sn^{2+} changes to

A. Sn

B. Sn^{3+}

C. Sn^{4+}

D. Sn^{+}

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1040. Fe shows an oxidation state of $+1$ in :

A. fluorine is more electronegative than Oxygen.

B. fluorine does not Possess d-orbitals

C. fluorine stabilises lower oxidation State

D. in covalent compounds fluorine can form single bond only while oxygen forms double bond.

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1041. Why do elements in the same group have similar physical and chemical properties ?

A. both belong to d-block

B. both have same number of electrons

C. both have similar atomic radius

D. both belong to the same group of the periodic table

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1042. Write one oxidising reaction of $KMnO_4$ in basic medium.

A. Both HCl and $KMnO_4$ act as oxidising agents.

B. $KMnO_4$oxidises HCl into Cl_2 which is also an oxidising agent.

C. $KMnO_4$ is a weaker oxidising agent than HCl.

D. $KMnO_4$ acts as a reducing agent in the presence of HCl.

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1043. Give the formula of following compound : pentaamminecarbonatocobalt(III)chloride

A.

B.

C.

D.

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1044. Give the formula of following compound : mercury tetrathiocyanatocobaltate(III)

A.

B.

C.

D.

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1045. Write the iupac name of the compound : $\left[Co(NH_3)_4(H_2O)Cl\right]Cl_2$

A.

B.

C.

D.

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1046. Write the iupac name of the compound : $K_3\left[Al(C_2O_4)_3\right]$

A.

B.

C.

D.

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1047. Write the iupac name of the compound : $\left[Co(en)_2Cl_2\right]^{+1}$

A.

B.

C.

D.

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1048. Write the iupac name of the compound : $\left[Ni(NO)_4\right]$

A.

B.

C.

D.

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1049. Write the iupac name of the compound : $[Cu(NH_3)(H_2O)Cl_2]$

A.

B.

C.

D.

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1050. Write the iupac name of the compound : $K_2\left[Cu(CN)_4\right]$

A.

B.

C.

D.

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1051. Write the iupac name of the compound : $\left[Cr(en)_3\right]Cl_3$

A.

B.

C.

D.

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1052. Write the iupac name of the compound : $K_3[Fe(CN)_5NO]$

A.

B.

C.

D.

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1053. Write the iupac name of the compound : $[CrCl(NH_3)(en)_2]^+$

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1054. Write the iupac name of the compound : $\left[CoCl_2(NH_3)_4\right]^+$

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1055. Match the properties given in Column I with the metals given in Column II.

Column I (Property)	Column II (Metal)
(a) An element which can show +8 oxidation state	(i) Mn
(b) 3d block element that can show upto +7 oxidation state	(ii) Cr (iii) Os
(c) 3d block element with highest melting point	(iv) Fe

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1056. Match the statements given in Column I with the oxidation states given in Column II.

Column I	Column II
(*a*) Oxidation state of Mn in MnO_2 is	(*i*) +2
(*b*) Most stable oxidation state of Mn is	(*ii*) +3
(*c*) Most stable oxidation state of Mn in oxides is	(*iii*) +4
(*d*) Characteristic oxidation state of lanthanoids is	(*iv*) +5
	(*v*) +7

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1057. Match the solutions given in Column I and the colours given in Column II.

Column I (Aqueous solution of salt)	Column II (Colour)
(*a*) $FeSO_4.7H_2O$	(*i*) Green
(*b*) $NiCl_2.4H_2O$	(*ii*) Light pink
(*c*) $MnCl_2.4H_2O$	(*iii*) Blue
(*d*) $CoCl_2.6H_2O$	(*iv*) Pale green
(*e*) Cu_2Cl_2	(*v*) Pink
	(*vi*) Colourless

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1058. Write the iupac name of the compound : $\left[Co(en)_3\right]^{+3}$

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1059. Match the properties given in Column I with the metals given in Column II.

Column I (Property)	Column II (Metal)
(a) Element with highest second ionisation enthalpy	(i) Co
(b) Element with highest third ionisation enthalpy	(ii) Cr
(c) M in $M(CO)_6$ is	(iii) Cu
(d) Element with highest heat of atomisation	(iv) Zn
	(v) Ni

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1060. Assertion : Cu^{2+} iodide is not known.

Reason : Cu^{2+} oxidises I^- to iodine.

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

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

C. (c) Assertion is true but reason is false.

D. (d) Assertion is false but reason is true.

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1061. Write the IUPAC name of the following: $Al\left[Co(en)_3\right]$

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1062. Write the IUPAC name of the following: $Mg[NiCl_4]$

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1063. Assertion : Cu cannot liberate hydrogen from acids.

Reason : Because it has positive electrode potential.

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1064. Assertion : The highest oxidation state of osmium is +8.

Reason : Osmium is a 5d-block element.

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1065. Explain the following observation : Cu^+ ion is not known in aqueous solutions.

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1066. Why is equropium (II) more stable than cerium (II) (Eu = 63, Ce =58) give one reason.

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1067. Which ion has maximum size in Lanthanoid series ?

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1068. Write the general electronic configuration of lanthanoids.

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1069. Why does Mn(II) shows maximum paramagnetic character among the divalent ions of first transition series ?

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1070. How would you account for the irregular variation of ionisation enthalpies (first and second) in the first series of the transition elements?

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1071. Write chemical reaction for preparation of K2Cr207 from chromite ore.

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1072. What is meant by 'disproportionation'? Give two examples of disproportionation reaction in aqueous solution.

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1073. Compare the chemistry of actinides with that of Lanthanides with special reference to oxidation state

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1074. Compare the chemistry of actinides with that of Lanthanides with special reference to oxidation state

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1075. The 4d and 5d series of transition metals have more frequent metal-metal bonding in their compounds than do the 3d transition metals. Explain.

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1076. What are the main consequences of lanthanoid contraction ?

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1077. Complete the following reaction equation : $MnO_4^- + Fe^{2+} + H^+ \rightarrow$

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1078. Complete the following reaction equation :

$MnO_4^- + I^- + H_2O \rightarrow$

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1079. Complete the following reaction equation :

$S_2O_3^{2-} + Cr_2O_7^{2-} + H^+ \rightarrow$

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1080. How would you account for the following : The transition elements exhibit high enthalpy of atomization.

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1081. How would you account for the following : Of the d^4 species, Cr^{2+} is strongly reducing while Mn(III) is strongly oxidising.

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1082. How would you account for the following: Cobalt(II) is stable in aqueous solution but in the presence of complexing reagents it is easily oxidised.

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1083. Why is equropium (II) more stable than cerium (II) (Eu = 63, Ce =58) give one reason.

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1084. Why Zr and Hf exhibit similar properties ?

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1085. Explain the following : Scandium forms no coloured ions, yet it is regarded as a transition metal.

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1086. Explain the structure of chromate and dichromate ions.

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1087. Why do transition metals and their compounds are found to be good catalysts and form alloys ?

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1088. The paramagnetic character of first transition series increases upto manganese and then decreases. Explain .

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1089. Why do transition metals form complexes and coloured ions?

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