

CHEMISTRY

BOOKS - PREMIERS PUBLISHERS

TRANSITION AND INNER TRANSITION ELEMENTS

Evaluation Textbook Questions Answers | Choose The Correct Answer

1. Sc($Z = 21$) is a transition element but Zinc ($z = 30$) is not because :
- A. both Sc^{3+} and Zn^{2+} ions are colourless and form white compounds.
 - B. in case of Sc, 3d orbital are partially filled but in Zn these are completely filled
 - C. last electron as assumed to be added to 4s level in case of zinc.

D. both Sc and Zn do not exhibit variable oxidation states.

Answer: B

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2. Which of the following d block element has half filled penultimate d sub shell as well as half filled valence sub shell ?

A. Cr

B. Pd

C. Pt

D. none of these

Answer: A

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3. Among the transition metals of 3d series, the one that has highest negative (M^{2+} / M) standard electrode potential is :

A. Ti

B. Cu

C. Mn

D. Zn

Answer: A

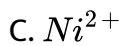


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4. Which one of the following ions has the same number of unpaired electrons as present in V^{3+} ?

A. Ti^{3+}

B. Fe^{3+}



Answer: C

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5. The magnetic moment of Mn^{2+} ion is :

A. 5.92 BM

B. 2.80 BM

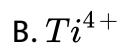
C. 8.95 BM

D. 3.90 BM

Answer: A

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6. Which of the following compounds is colourless ?



Answer: B



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7. The catalytic behaviour of transition metals and their compounds is ascribed mainly due to :

A. their magnetic behaviour

B. their unfilled d orbitals

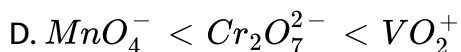
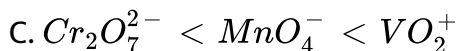
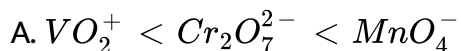
C. their ability to adopt variable oxidation states.

D. their chemical reactivity

Answer: C

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8. The correct order of increasing oxidizing power in the series :



Answer: A

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9. The alloy of copper that contain Zinc is :

A. Monel metal

B. Bronze

C. Bell metal

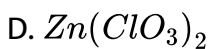
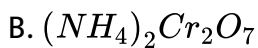
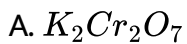
D. Brass

Answer: D



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



Answer: B

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11. In acid medium, potassium permanganate oxidizes oxalic acid to :

A. oxalate

B. Carbon dioxide

C. acetate

D. acetic acid

Answer: B

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12. 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 in colour.
- D. $K_2Cr_2O_7$ solution becomes yellow on increasing the p^H beyond 7.

Answer: B

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13. Permanganate ion changes to in acidic medium :

- A. MnO_4^{2-}
- B. Mn^{2+}
- C. Mn^{3+}
- D. MnO_2

Answer: B

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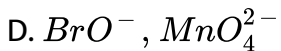
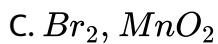
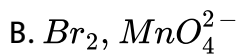
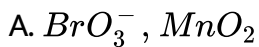
14. A white crystalline salt (A) react with dilute HCl to liberate a suffocating gas (B) and also forms a yellow precipitate. The gas (B) turns potassium dichromate acidified with dil. H_2SO_4 to a green coloured solution (C). A, B and C are respectively :

- A. $Na_2SO_3, SO_2, Cr_2(SO_4)_3$
- B. $Na_2S_2O_3, SO_2, Cr_2(SO_4)_3$
- C. $Na_2S, SO_2, Cr_2(SO_4)_2$
- D. $Na_2SO_4, SO_2, Cr_2(SO_4)_2$

Answer: A

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15. MnO_4^- react with Br^- in alkaline p^H to give :



Answer: A



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16. How many moles of I_2 are liberated when 1 mole of potassium dichromate react with potassium iodide ?

A. 1

B. 2

C. 3

D. 4

Answer: C



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17. The number of moles of acidified $KMnO_4$ required to oxidise 1 mole of ferrous oxalate (FeC_2O_4) is :

A. 5

B. 3

C. 0.6

D. 1.5

Answer: C



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18. When a brown compound of Mn (A) is treated with HCl, it gives gas (B). The gas (B) taken in excess reacts with NH_3 to give an explosive compound (C). The compound A, B and C are :

- A. MnO_2, Cl_2, NCl_3
- B. MnO, Cl_2, NH_4Cl
- C. Mn_3O_4, Cl_2, NCl_3
- D. MnO_3, Cl_2, NCl_2

Answer: A



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19. Which one of the following statements related to lanthanons is incorrect ?

- A. Europium shows + 2 oxidation state.

- B. The basicity decreases as the ionic radius decreases from Pr to Lu.
- C. All the lanthanons are much more reactive than aluminium.
- D. Ce^{4+} solutions are widely used as oxidising agents in volumetric analysis.

Answer: C

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20. Which of the following lanthanoid ions is diamagnetic ?

- A. Eu^{2+}
- B. Yb^{2+}
- C. Ce^{2+}
- D. Sm^{2+}

Answer: B



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21. Which of the following oxidation states is most common among the lanthanoids ?

A. 4

B. 2

C. 5

D. 3

Answer: D



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22. Assertion : Ce^{4+} is used as an oxidizing agent in volumetric analysis.

Reason : Ce^{4+} has the tendency of attaining + 3 oxidation state.

- 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. Both assertion and reason are false.

Answer: A



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23. The most common oxidation state of actinoids is :

A. +2

B. +3

C. +4

D. +6

Answer: C



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24. The actinoid elements which show the highest oxidation state of +7 are :

A. Np, Pu, Am

B. U, Fm, Th

C. U, Th, Md

D. Es, No, Lr

Answer: A

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25. Which one of the following is not correct ?

A. $La(OH)_2$ is less basic than $Lu(OH)_3$.

B. In lanthanoid series ionic radius of Ln^{3+} ions decreases.

C. La is actually an element of transition metal series rather lanthanide series.

D. Atomic radii of Zr and Hf are same because of lanthanide contraction.

Answer: A

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1. What are transition metals ? Give four examples.

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2. Explain the oxidation states of 3d series elements.

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3. What are inner transition elements ?

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4. Justify the position of lanthanides and actinides in the periodic table.

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5. What are actinides ? Give three examples.

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6. Why Gd^{3+} is colourless ?

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7. Explain why compounds of Cu^{2+} are coloured but those of Zn^{2+} are colourless.

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8. Describe the preparation of potassium dichromate.

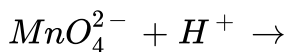
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9. What is lanthanide contraction and what are the effects of lanthanide contraction ?

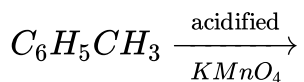
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10. Complete the following :



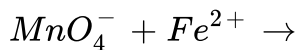
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11. Complete the following :



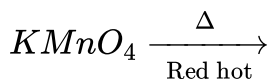
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12. Complete the following :



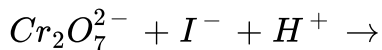
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13. Complete the following :



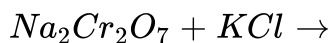
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14. Complete the following :



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15. Complete the following :





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16. What are interstitial compounds ?



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17. Calculate the number of unpaired electrons in Ti^{3+} , Mn^{2+} and calculate the spin only magnetic moment.



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18. Write the electronic configuration of Ce^{4+} and Co^{2+} .



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19. Explain briefly how + 2 states becomes more and more stable in the first half row transition elements with increasing atomic number.

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20. Which is more stable ? Fe^{3+} or Fe^{2+} - Explain.

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21. Explain the variation in $E_{M^{3+} / M^{2+}}^0$, series.

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22. Compare lanthanides and actinides.

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23. Explain why Cr^{2+} is strongly reducing while Mn^{3+} is strongly oxidizing.

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24. Compare the ionization enthalpies of first series of the transition elements.

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25. Actinoid contraction is greater from element to element than the lanthanoid contraction, why ?

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26. Out of $Lu(OH)_3$ and $La(OH)_3$ which is more basic and why ?

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27. Why europium (II) is more stable than Cerium (II) ?

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28. Why do zirconium and hafnium exhibit similar properties ?

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29. Which is stronger reducing agent Cr^{+2} or Fe^{+2} ?

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30. The $E_{M^{2+}/M}^{\circ}$ value for copper is positive. Suggest a possible reason for this.

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31. Predict which of the following will be coloured in aqueous solution

Ti^{2+} , V^{3+} , Sc^{4+} , Cu^{+} , Sc^{3+} , Fe^{3+} , Ni^{2+} and Co^{3+} .



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32. Describe the variable oxidation state of 3d series elements.



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33. Which metal in the 3d series exhibits + 1 oxidation state most frequently and why ?



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34. Why first ionization enthalpy of chromium is lower than that of zinc ?



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35. Transition metals show high melting points why ?



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Other Important Questions Answers I Choose The Correct Answer

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

A. $Cr > Mn > V > Ti$

B. $V > Mn > Cr > Ti$

C. $Mn > Cr > Ti > V$

D. $Ti > V > Cr > Mn$

Answer: A



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2. The electronic configuration of Cu(II) is $3d^{10}$ 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) salts depends on the nature of copper salts.

Answer: A



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3. Although zirconium belongs to 4d transition series and Hafnium belongs to 5d transition series even their have similar physical and

chemical properties because :

- 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.

Answer: C



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4. Why HCl is not used to make the medium acidic in oxidation reactions of $KMnO_4$ in acidic medium ?

- A. Both HCl and $KMnO_4$ act as oxidising agents.
- B. $KMnO_4$ oxidises HCl, to 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.

Answer: B

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5. $KMnO_4$ acts as an oxidising agent in acidic medium. The number of moles of $KMnO_4$ that will be needed to react one mole of sulphide ions in acidic solution is :

A. $\frac{2}{5}$

B. $\frac{3}{5}$

C. $\frac{4}{5}$

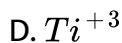
D. $\frac{1}{5}$

Answer: A

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6. Which one of the following ions is the most stable in aqueous solution :

Note : Atomic No : Ti = 22, V = 23, Cr = 24, Mn = 25.



Answer: B



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7. In acidic medium MnO_4^{-2} :

A. disproportionates to MnO_2 and MnO_4^-

B. is oxidised to MnO_4^-

C. reduced to MnO_2

D. is reduced to Mn^{+2}

Answer: A



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8. Consider the following statements :

(i) $La(OH)_3$ is the least basic among hydroxides of lanthanides

(ii) Zn^{+4} and Hl^{+4} possess almost same ionic radii

(iii) Ce^{+4} can act as oxidising agent. Which of the above is/are true ?

A. All

B. (ii) and (iii)

C. (ii) only

D. (i) and (iii)

Answer: B



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9. Large number of oxidation states are exhibited by actinoids than these by the lanthanoids, the main reason being :

- A. more energy difference between 5f and 6d than between 4f and 5d orbitals.
- B. more reactive nature of the actinoids than the lanthanoids.
- C. 4f orbitals more diffused than 5f orbitals.
- D. less energy difference between 5f and 6d than between 4f and 5d orbitals.

Answer: D



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10. Irregular trend in the standard reduction potential value of the first row transition elements is due to :

- A. regular variation of first and second row enthalpies.
- B. irregular variation of sublimation enthalpies.
- C. regular variation of sublimation enthalpies.
- D. increase in number of unpaired electrons.

Answer: B

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11. Knowing that the chemistry of lanthanoids (Ln) is determined by its + 3 oxidation state, which of the following statement is incorrect ?

- A. The ionic size of Ln(III) decrease in general with increasing atomic number.

B. Ln(III) compounds are generally colourless.

C. Ln(III) hydroxides are mainly basic in character.

D. Because of large size of Ln(III) ions the bonding in its compounds is predominantly ionic in character.

Answer: B

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12. Which of the following statements regarding cerium (atomic no. 58) is incorrect ?

A. The common oxidation state of cerium are + 3 and + 4.

B. + 3 oxidation state of Ce is more stable than + 4.

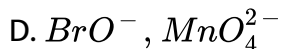
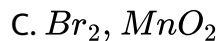
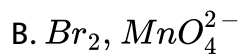
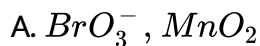
C. The + 4 oxidation state of Ce is not known in solution.

D. Cerium (IV) acts as an oxidising agent.

Answer: C

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13. MnO_4^- react with Br^- in alkaline p^H to give :



Answer: A

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14. Amount of oxalic acid present in a solution can be determined by 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 carbondioxide and water.
- C. gets oxidised by oxalic acid to chlorine.
- D. furnishes H^+ ions in additional to those from oxalic acid.

Answer: A



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15. The spin only magnetic moment of Fe^{+2} (in B_{μ}) is approximately :

- A. 4
- B. 7
- C. 5
- D. 6

Answer: C



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16. Electronic configuration of a transition element X in + 3 oxidation state is $[Ar]3d^5$. What is its atomic number ?

A. 25

B. 26

C. 27

D. 24

Answer: B



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17. Metallic radii of some elements are given below : Which of these elements will have highest density ?

Element	<i>Fe</i>	<i>Co</i>	<i>Ni</i>	<i>Cu</i>
Metallic radii/pm	126	125	125	128

A. Fe

B. Ni

C. Co

D. Cu

Answer: D

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18. 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. $3d^2$

Answer: B



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19. There are 14 elements in actinoid series which of the following elements does not belong to this series ?

A. Cl

B. Np

C. Tm

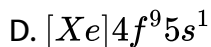
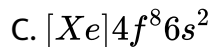
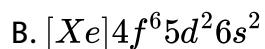
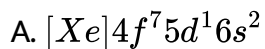
D. Fm

Answer: C



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20. Gadolinium belongs to 4f series. Its atomic number is 64. Which of the following is the correct electronic configuration of gadolinium?



Answer: A



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21. Highest oxidation state of manganese in fluoride is $+4(MnF_4)$ but the highest oxidation state in oxides is $+7(Mn_2O_7)$ because :

- A. fluorine is more electronegative than oxygen.
- B. fluorine does not possess 'd' orbital.
- C. fluorine stabilises lower oxidation state.
- D. in covalent compounds fluorine can form only single bonds while oxygen can form double bonds.

Answer: D

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22. Assertion : Mercury is not considered as a transition element.

Reason : Mercury is liquid.

- A. If both assertion and reason are true and reason is the correct explanation of the assertion.
- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true, but reason is false.
- D. If both assertion and reason are false.

Answer: B



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23. Assertion : In any transition series the magnetic moment of M^{+2} ions first increases and then decreases.

Reason : In a transition series, the number of unpaired electrons increases and then decreases.

- A. If both assertion and reason are true and reason is the correct explanation of the assertion.
- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true, but reason is false.
- D. If both assertion and reason are false.

Answer: A



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24. The complex forming tendency of a transition metal depends upon :

- A. the availability of number of vacant 'd' orbitals.
- B. high ionisation energy.
- C. large size of the cation or high charge density.

D. variable oxidation states.

Answer: A

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25. Which lanthanide is most commonly used ?

A. La

B. No

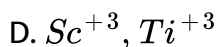
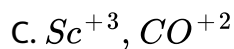
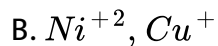
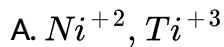
C. Th

D. Ce

Answer: A

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26. In which of the following pairs are both the ions coloured in aqueous solution ?



Answer: A



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27. When manganese dioxide is fused with KOH or K_2CO_3 in air, it gives :

A. potassium permanganate

B. manganese oxide

C. manganese heptoxide

D. potassium manganate

Answer: D

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Other Important Questions Answers | Answer The Following Questions

1. Write the electronic configuration of (a) Cr^{+3} , (b) Cu^{+} , (c) CO^{+2} , (d) Mn^{+2} , (e) Pm^{+3} , (f) Ce^{+4} , (g) Lu^{+2} , (h) Th^{+4} .

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2. To what extent do the electronic configuration decide the stability of oxidations states in the first series of transition elements. Illustrate your answer with an example.

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3. Explain why transition elements have many irregularities in their electronic configuration.

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4. 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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5. What are the stable oxidation states of the transition elements with the electronic configuration in their ground states of their atoms $3d^3$, $3d^5$, $3d^8$, and $3d^4$.

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6. For M^{+2}/M and M^{+3}/M^{+2} systems, the E° values for some metals are as follows :

$$Cr^{+2}/Cr = -0.9V, Cr^{+3}/Cr^{+2} = -0.4V$$

$$Mn^{+2}/Mn = -1.2V, Mn^{+3}/Mn^{+2} = +1.5V$$

$$Fe^{+2}/Fe = -0.4V, Fe^{+3}/Fe^{+2} = +0.80V$$

Use this data to comment upon :

the stability of Fe^{+3} in acid solution as compared to Cr^{+3} or Mn^{+3}



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7. For M^{+2}/M and M^{+3}/M^{+2} systems, the E° values for some metals are as follows :

$$Cr^{+2}/Cr = -0.9V, Cr^{+3}/Cr^{+2} = -0.4V$$

$$Mn^{+2}/Mn = -1.2V, Mn^{+3}/Mn^{+2} = +1.5V$$

$$Fe^{+2}/Fe = -0.4V, Fe^{+3}/Fe^{+2} = +0.80V$$

Use this data to comment upon :

the case with which iron can be oxidised as compared to a similar process for either chromium or manganese metal.



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



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9. How would you account for the following ?

Many of the transition elements and their compounds can act as good catalysts.



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10. How would you account for the following ?

The metallic radii of the third (5d) series of transition elements are literally the same as those of the corresponding members of the second series.

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11. How would you account for the following ?

There is a greater range of oxidation states among actinoids than those of lanthanoids.

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12. 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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13. The electronic configuration of chromium and copper are $[Ar]3d^54s^1$ and $[Ar]3d^{10}4s^1$ respectively instead of $[Ar]3d^44s^2$ and $[Ar]3d^93s^2$. Explain.



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14. The melting and boiling points of Zn, Cd and Hg are low why ?



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15. Why Zn, Cd and Hg are soft and have low melting point ?



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16. Account for the trend in melting points of 3d series.

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17. Explain why manganese has a lower melting point than chromium.

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18. The second and third members of each group of transition elements have similar atomic radii - Explain.

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19. The atomic radii of the elements in a transition series do not vary much while they do vary in case of 's' and 'p' block elements explain.

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20. How would you account for the following ?

The atomic radius of metals of third (5d) series of elements are virtually same as those of corresponding members of the second (4d) series.

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21. How would you account for the following ?

Chromium is a typical hard metal while mercury is a liquid.

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

Reason for irregular variation of first IE :

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23. Silver atom has completely 'd' orbitals ($4d^{10}$) in its ground state.

How can you say that it is a transition element ?

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24. Which of the 3d transition metals exhibit the largest number of oxidation states ? and why ?

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

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26. What may be the stable oxidation state of the transition element with the following 'd' electronic configuration in the ground state of their atoms. $3d^3$, $3d^5$, $3d^8$ and $3d^4$.

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

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

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29. To what extent do the electronic configuration decide the stability of oxidations states in the first series of transition elements. Illustrate your answer with an example.

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30. Explain why $E^\circ (Mn^{+3} / Mn^{+2})$ couple is more positive than for $E^\circ (Fe^{+3} / Fe^{+2})$ (At. No. of Mn = 25, Fe = 26).

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31. The E° values in respect of the electrodes of chromium ($z = 24$), manganese ($z = 25$) and iron ($z = 26$) are :
 $Cr^{+3} / Cr^{+2} = -0.4V$, $Mn^{+3} / Mn^{+2} = 1.5V$, $Fe^{+3} / Fe^{+2} = 0.80V$.
. On the basis of the above information compare the feasibilities of further oxidation of their + 2 oxidation states.

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32. The $E^\circ (M^{+2} / M)$ value for copper is positive 0.34V. Explain why ?

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

$E^\circ (Cr^{+3} / Cr^{+2}) = -0.4/V$ and $E^\circ (Fe^{+3} / Fe^{+2})$ is 0.77V.

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34. Explain the terms paramagnetism and diamagnetism with a suitable examples.

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35. Calculate the magnetic moment of following ions.



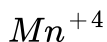
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36. Calculate the magnetic moment of following ions.



[View Text Solution](#)

37. Calculate the magnetic moment of following ions.



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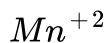
38. Calculate the magnetic moment of following ions.





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39. Calculate the magnetic moment of following ions.



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40. Calculate the magnetic moment of following ions.



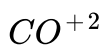
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41. Calculate the magnetic moment of following ions.



[View Text Solution](#)

42. Calculate the magnetic moment of following ions.



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43. Calculate the magnetic moment of following ions.



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44. Calculate the magnetic moment of following ions.



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45. Explain how transition metals and their compounds act as catalysts.

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46. Given examples wherein transition metal compounds acts as catalysts in various industrial processes.

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47. What is an alloy ? How are they formed ?

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48. Explain why transition metals have a tendency to form alloys.

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49. What are interstitial compounds ? Give examples.

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50. Mention the properties of interstitial compounds.

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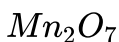
51. What are complexes or coordination compounds ? Give a brief account of complexes formed by transition metals.

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52. Give a brief account of oxides formed by transition metals.

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53. Classify the following oxides as acidic, basic and amphoteric



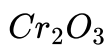
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54. Classify the following oxides as acidic, basic and amphoteric



 [View Text Solution](#)

55. Classify the following oxides as acidic, basic and amphoteric



 [View Text Solution](#)

56. Classify the following oxides as acidic, basic and amphoteric



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57. Give example and suggest reason for the following :

The lowest oxide of transition metal is basic, the highest is acidic.

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58. Give example and suggest reason for the following :

A transition metal exhibits higher oxidation states in oxides and fluorides.

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59. Give example and suggest reason for the following :

The highest oxidation state is exhibited in oxo anion of a metal.

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60. Indicate the steps involved in the preparation of

$K_2Cr_2O_7$ from chromite are

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61. Indicate the steps involved in the preparation of

$KMnO_4$ from pyrolusite are

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62. Give chemical oxidation and electrolytic oxidation of MnO_4^{-2} to

MnO_4^- .

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63. What happens when potassium dichromate is heated ? Give equation.



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64. Discuss the action of alkali on potassium dichromate.



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65. What is the effect of p^H on a solution of potassium dichromate ?



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66. Draw the structure of dichromate ion.



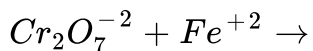
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67. Write the ionic equation to show that $K_2Cr_2O_7$ is an oxidising agent in acid medium.



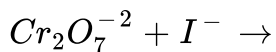
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68. Complete and balance the following equation : (all in acid medium)



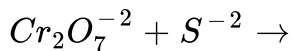
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69. Complete and balance the following equation : (all in acid medium)



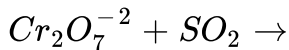
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70. Complete and balance the following equation : (all in acid medium)



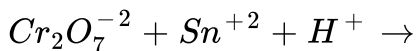
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71. Complete and balance the following equation : (all in acid medium)



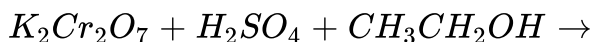
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72. Complete and balance the following equation : (all in acid medium)



 [View Text Solution](#)

73. Complete and balance the following equation : (all in acid medium)



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74. Describe chromyl chloride test.

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75. Mention the uses of potassium dichromate.

 [View Text Solution](#)

76. Draw the structure of MnO_4^- ion.

 [View Text Solution](#)

77. What happens when :

potassium permanganate is heated.

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78. What happens when :

is heated with cold conc. H_2SO_4

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79. What happens when :

is heated with hot conc. H_2SO_4 ?

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80. How does potassium permanganate act as an oxidising agent in neutral medium ? Explain with examples.

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81. Write ionic equation or the half reaction for the oxidising action of $KMnO_4$ in alkaline medium.

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82. What is Bayer's reagent ? Mention its use.

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83. What is the action of acidified $KMnO_4$ on

ferrous salts

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84. What is the action of acidified $KMnO_4$ on

Potassium iodide

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85. What is the action of acidified $KMnO_4$ on

Oxalic acid

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86. What is the action of acidified $KMnO_4$ on

Sulphide ion

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87. What is the action of acidified $KMnO_4$ on

nitrite ion

 [View Text Solution](#)

88. What is the action of acidified $KMnO_4$ on

Sulphite ion

 [View Text Solution](#)

89. Mention the uses of potassium permanganate.



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90. Find the equivalent weight of $KMnO_4$ in acidic, basic and neutral medium.



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91. What are inner transition elements ?

Decide which of the given atomic numbers are the numbers of inner transition elements : 29, 59, 74, 95, 102, 104.



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92. The chemistry of actinoid elements is not so smooth as that of lanthanoids justify then statement by giving some example from the oxidation state of these element.



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93. What is the last element in the series of actinoids? Comment on the possible oxidation state of element.

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94. Name of the members of the lanthanoid series which exhibit + 4 oxidation state. Try to correlate this type of behaviour with the electronic configuration of these elements.

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95. Write the electronic configuration of the elements with atomic numbers 61, 91, 101 and 109.

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96. Compare the chemistry of actinoids with that of lanthanoids with special reference to electronic configuration

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97. Compare the chemistry of actinoids with that of lanthanoids with special reference to Oxidation state

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98. Compare the chemistry of actinoids with that of lanthanoids with special reference to Atomic and ionic radii

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99. Compare the chemistry of actinoids with that of lanthanoids with special reference to

Chemical reactivity

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100. The + 3 oxidation state of lanthanum ($Z = 57$), gadolinium ($Z = 64$) and lutetium ($Z = 71$) are especially stable. Why ?

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101. The outer electronic configuration of two members of the lanthanoid are as follows :

(i) $4f^1, 5f^1, 6s^2$ and (ii) $4f^7 5d^0 6s^2$

What are their atomic number predict the oxidation state exhibited by these elements in their compounds.

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102. Give an explanation for each of the following observations.

The gradual decrease in size (actinoid contraction) from element to element is greater among actinides than that among lanthanides.

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103. Give an explanation for each of the following observations.

The actinoids exhibit greater range of oxidation states than the lanthanoids.

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104. Give an explanation for each of the following observations.

Zr and Hf have identical sizes.

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105. Give an explanation for each of the following observations.

Ionisation enthalpies of Ce, Pr and Nd are higher than Th, Pa Cl. Why ?

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106. Give an explanation for each of the following observations.

Ce^{+4} is used as an oxidising agent in volumetric analysis.

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107. Account for the following :

Europium (II) is more stable than cerium (II)

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108. Account for the following :

Actinoid ions are generally coloured.



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109. On the basis of lanthanoid contraction, explain the following :

Nature of bonding in La_2O_3 and Lu_2O_3 .



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110. On the basis of lanthanoid contraction, explain the following :

Trends in the stability of oxosaltes of lanthanoids from La to Lu.



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111. On the basis of lanthanoid contraction, explain the following :

Stability of complexes of lanthanides.



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112. On the basis of lanthanoid contraction, explain the following :

Radii of 4d and 5d block element.



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113. On the basis of lanthanoid contraction, explain the following :

Trends in acidic character of lanthanoid oxides.



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114. What is meant by the term Lanthanoid contraction ? What is it due to and what consequences does it have on the chemistry of lanthanides in the periodic table.



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