



# CHEMISTRY

## BOOKS - JEEVITH PUBLICATIONS CHEMISTRY (KANNADA ENGLISH)

### THE 'd' - AND 'f' - BLOCK ELEMENTS

#### Question and Answer

1. Define the term transition element.



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2. Give the general electronic configurations of 'd' block elements.



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3. Why scandium ( $z=21$ ) is a transition element but zinc is not?



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4. Write electronic configuration, calculate magnetic moment and predict magnetic properties of '3d' elements.



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5. Write electronic configuration, calculate magnetic moment and predict magnetic properties of some 3d element ions.



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6. Write the formula to calculate spin only magnetic moment.



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7. Name the metal of the 1<sup>st</sup> row transition series that has maximum no. of unpaired electrons in its ground state.



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8. Name the metal of the 1<sup>st</sup> row transition series that has zero spin only magnetic moment in its +2 oxidation state.



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9. Name the metal of the 1<sup>st</sup> row transition series that Exhibits maximum number of oxidation states.



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**10.** With reference to the first row transition metals.

Name a metal which shows maximum number of oxidation states.



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**11.** With reference to first row transition series.

Among  $Zn^{+2}$  and  $Cu^{+2}$  which is colourless.



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**12.** With reference to first row transition series.

Between  $Ti^{+2}$  and  $V^{+2}$  which ion contains more number unpaired electrons.



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**13.** Calculate the spin only magnetic moment of  $Fe^{2+}$



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14. Which element of 3d series exhibits maximum oxidation state?



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15. Between  $Cu_{(aq)}^{2+}$  and  $Cu_{(aq)}^{+}$  which is more stable?



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**16.** Transition metals are very hard and have high melting and boiling points. Give reason.



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**17.** d' block elements shows variable oxidation states Why.



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



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**19.**  $Sc^{3+}$  ions are colourless where as  $V^{3+}$  ions are coloured. Give reason.



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20. Why  $Sc^{3+}$  salts are colourless whereas  $Cr^{3+}$  salts are coloured.



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21. Why  $Ti^{4+}$  is colourless where as  $Cr^{3+}$  salts are coloured.



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**22.** Name the electrode system which have positive  $E^0$  value in 3d series. Give reason.



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**23.** Give any two reasons for the formation of large number of complex compounds by transition metals.



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24.  $Cu^{2+}$  ions are coloured but  $Zn^{2+}$  ions are colourless. Give reason.



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25. Transition elements shows catalytic property. Give two reason.



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26. What are interstitial compounds?



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27. How is potassium dichromate prepared from chromite ore ?



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28. Show that chromates and dichromates are interconvertible.



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29. Give the structure of chromate ion?



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30. Give two example to show that potassium dichromate is an oxidising agent.



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31. How is potassium permanganate manufactured from  $MnO_2$  (pyrolusite)?





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**32.** Name a compound which is isostructural with  $KMnO_4$ .



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**33.** What happens when potassium permanganate crystals are heated?



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**34.** What is the shape of manganate and permanganate ions? Write structures.



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**35.** What is the magnetic nature of manganate and permanganate ions.



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**36.** Give four examples to show that acidified  $KMnO_4$  is an oxidising agent.



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**37.** What is lanthanoid contraction? Mention the cause for it.



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**38.** What is lanthanoid contraction? Write the general oxidation state of actinoids.



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**39.** Give two consequences of lanthanoid contraction.



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**40.** What happens when lanthanoids are heated in Oxygen



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**41.** What happens when lanthanoids are heated in Nitrogen



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**42.** What happens when lanthanoids are heated in Halogen



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**43.** What happens when lanthanoids are heated in Carbon?



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**44.** How lanthanoids reacts with water and dil. Acids?



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**45.** What is mischmetal? Give its one use.



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**46.** What is actinoid contraction? Why actinoid contraction is greater than lanthanoid contraction?



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**47.** Give reason: Actinoid contraction is greater from element to element than lanthanoid contraction.



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**48.** Give general oxidation state of actinoids. Why actinoids shows variable oxidation states?



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**49.** Zr and Hf have almost identical atomic radii. Give reason.



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**50.** Give reasons:

Actinoids show variable oxidation states.



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**51.** Give reasons:

Zr and Hf have almost identical radii.



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**52.** Give reason: Why Lanthanoids are less reactive than actinoids.



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**53.** Out of the following elements identify the element which does not exhibit variable oxidation state Cr Co Zn.



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**54.** Give Reason.

Most of the transition metals have high melting point and boiling point.



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**55. Give Reason.**

Second ionisation enthalpy of copper is exceptionally high.



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**56. Give reason.**

Atomic size of 4d and 5d series elements are almost the same.



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57. Study of actinoid elements is difficult. Give two reasons.



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58. Give reasons :

Cerium (Ce) exhibits +4 oxidation state



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59. Among  $Fe^{2+}$  and  $Fe^{3+}$  which is more stable? Give reason.



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**60.** Give reason:

Mn exhibits the higher oxidation state of +7 among 3d series transition elements.



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**61.** Give reason:

$Cu^{2+}$  is paramagnetic and  $Cu^{+}$  is diamagnetic.



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**62.** Give reason 'transition metals generally form coloured compound'.



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