



CHEMISTRY

BOOKS - CHETANA PUBLICATION

Transition and Inner Transition Elements

Example

1. Which elements in the periodic table are transition elements?



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2. What is the general electronic configuration of transition elements?

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3. In which block of the modern periodic table are the transition and inner transition elements placed ?

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4. What is the position of the transition elements in the periodic table? Comment in brief?

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5. Write the probable electronic configuration of chromium and copper.

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6. Explain, in brief, the electronic configuration of each of the series in the d block.

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7. What is the general electronic configuration of 3d series of d block elements .

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8. Explain, in brief, the oxidation states of first transition series.

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9. Write the electronic configuration of Mn^{+6} , Mn^{+4} , $Fe(4+)$, $Co(3+)$, $Ni(2+)$.

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10. Which of the first transition series elements shows the maximum number of oxidation states and why?

Which elements in the 4d and 5d series will show maximum number of oxidation.

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11. What are the stable oxidation states of plutonium, Cerium, manganese and europium.

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12. Iron exhibits +2 and +3 oxidation states Write their electronic configuration. Which will be more stable? Why?

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13. Explain in brief, the trends in atomic and ionic radii of the transition series.

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14. What is meant by 'shielding of electrons' in an atom?

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15. Explain the trends in ionisation enthalpies of d-block elements.





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16. Explain the trends in ionisation enthalpies of d-block elements.



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17. Write a short note on Magnetic properties of transition metals.

*What is meant by paramag and diamagnetism.



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18. Calculate the spin only magnetic moment of divalent cation of a transition metal with atomic number 25.

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19. Calculate the spin only magnetic moment of divalent cation of element having atomic number 27.

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20. What will be the magnetic moment of transition metal having 3 unpaired electrons?

(a) equal to 1.73 BM,

(b) less than 1.73 BM or

(c) more than 1.73 BM?

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21. Out of cobalt and zinc salts, which is attracted in a magnetic field? Why?

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22. A metal ion from the first transition series has two unpaired electrons. Calculate the magnetic moment.

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23. Pick up the paramagnetic species , $\text{Cu}^{(1^+)}$, $\text{Fe}^{(3^+)}$, $\text{Ni}^{(2^+)}$, $\text{Zn}^{(2^+)}$, $\text{Cd}^{(2^+)}$, $\text{Pd}^{(2^+)}$.

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24. What happens when magnetic field is applied to substances?

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25. What is meant by diamagnetic and paramagnetic?
Give one example of diamagnetic and paramagnetic

transition metal and lathanides metal.

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26. Why are compounds of transition elements generally coloured?

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27. Compounds of s and p block elements are almost white. What could be the absorbed radiation : uv or visible ?

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28. Why salt of Sc^{+3} , $Ti(4+)$, $V(3+)$ are colourless?

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29. Why Zn^{2+} salts are colourless while Ni^{2+} are coloured?

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30. Which of the following ion is colourless?

Cu^{+1} , Cu^{2+}

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31. Which of the following ions are expected to be coloured?



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32. Transition metals are widely used as catalysts.

Explain. Why?



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33. Give some examples of reactions where transition metals are used as catalysts.

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

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35. Explain, the formation of interstitial compound in transition elements.

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36. Explain in brief, why transition metals form alloys.

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37. What is an alloy ?

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38. Do atomic radii of 3d transition elements differ largely ?

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39. How will you prepare $KMnO_4$ by chemical oxidation?

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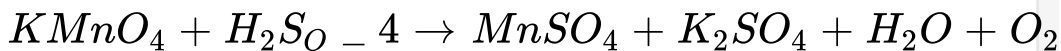
40. How will you prepare $KMnO_4$ by electrolytic oxidation?

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41. With the help of reactions, show that $KMnO_4$ is an oxidising agent.

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42. Balance the following equation.



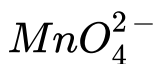
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43. Give uses of $KMnO_4$ uses.



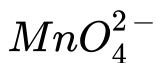
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44. What is the oxidation state of Mn in.



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45. What is the oxidation state of Mn in.



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46. What steps are involved in manufacture of potassium dichromate from chromite are?

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47. Discuss, in brief the chemical properties of $\text{K}_2\text{Cr}_2\text{O}_7$.

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48. How are metals found in nature?



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49. Name two salts of metals that are found in nature.



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50. What is a mineral? Define mineral.



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51. Define an ore.



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52. Enlist the ores of some transition metals like Fe, Cu and Zn.



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53. What are the different types of metallurgical process?



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54. What are the different steps involved in metallurgical process?



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55. Extraction of Iron from Haematite ore using blast furnace:



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56. Name the different zones in blast furnace. Write the reactions taking place in them.



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57. Make a summaries of the reactions in the blast furnace.

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58. Name the different commercial forms of iron?

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59. How can we modify the properties of steel?

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60. What are the difference between cast iron, wrought iron and steel?

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61. Upto what temperature does Iron posses ferrmagnetism?

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62. What are f-block elements? Where are they placed in the periodic table?

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63. Why f-block elements are called inner transition metals?

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64. Give chemical reactions when lanthanides reacts with (i) water(ii) oxygen (iii) Nitrogen (iv) halogens (v) carbon

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65. Enlist some properties of lanthanoids

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66. What is the general electronic configuration of lanthanoids.

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67. Why the ground state electronic configuration of gadolinium and ytterbium are different than expected?

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68. What is ionization enthalpy?

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69. Explain the abnormally low value of third ionization enthalpy of lanthanum, Gadolinium and lutetium.

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70. Write a short note on oxidation states of lanthanides

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71. Cerium and Terbium behave as good oxidising agents in +4 oxidation state. Explain



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72. Europium and ytterbium behave as good reducing agents in +2 oxidation states.



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73. Write a brief note on colour of trivalent ions of lanthanides?



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74. What is lanthanide contraction? What are causes of lanthanide contraction

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75. Do you think that lanthanoid complexes show magnetism?

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76. Calculate the spin only magnetic moment of La^{3+}

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77. What are the application of lanthanoids

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78. What is the position of Actinoids in the periodic table?

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79. What is the general electronic configuration of actinoids.

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80. Write a short note on oxidation states of actinoids.

 [Watch Video Solution](#)

81. Write is actinoid contraction? Explain in brief.

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82. State, in brief, the properties of Actinoids.

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83. The atomic number of an element is 90. Is this element diamagnetic or paramagnetic?

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84. Why nobelium is the only actinoid with +2 oxidation state?

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85. What are the applications of actinoids.

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86. Mention any four points of differences between lanthanides and actinoids

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87. Write the electronic configuration of actinide.

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88. Compare and comment between innertransition and transition metals.

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89. What are postactinoids?



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90. How is uranium extracted?

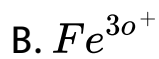


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Exercise

1. Which one of the following is dimagnetic Cr^{2+} Fe^{3+}
 Cu^{2+} Sc^{3+}

A. Cr^{2+}

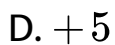
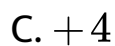
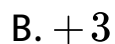
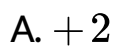


Answer:



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2. Most stable oxidation state of Titanium is



Answer:



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3. Components of Nichrome alloy are

A. Ni,Cr,Fe

B. Ni,Cr,Fe,C

C. Ni,Cr

D. Cu,Fe

Answer:



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4. Most stable oxidation state of Ruthenium is

A. +2

B. +4

C. +8

D. +6

Answer:



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5. Stable oxidation states for chromium are

A. +2, +3

B. +3, +4

C. +4, +5

D. +3, +6

Answer:



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6. Electronic configuration of Cu and Cu^{+1}

A. $3d^{10}, 4s^0, 3d^9, 4s^0$

B. $3d^9, 4s^1, 3d^9, 4s^0$

C. $3d^{10}, 4s^1, 3d^{10}, 4s^0$

D. $3d^8, 4s^1, 3d^{10}, 4s^0$

Answer:



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7. Which of the following have d^0s^0 configuration

Sc³⁺, Ti⁴⁺, V⁵⁺

A. Sc³⁺

B. Ti(4⁺)

C. V⁵⁺

D. all of the above

Answer:



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8. Magnetic moment of a metal complex is 5.9 B.M.
number of unpaired electrons in the complex is

A. 2

B. 3

C. 4

D. 5

Answer:



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9. In which of the following series all the elements are radioactive in nature Lanthanides, Actinides, d-block elements, s-block elements

A. Lanthanides

B. Actinides

C. d-block elements

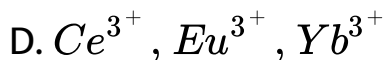
D. s-block elements

Answer:



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10. Which of the following sets of ions contain only paramagnetic ions



Answer:



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11. Which actinoid, other than uranium, occur in significant amount naturally?

A. Thorium

B. Actinium

C. Protactinium

D. Plutonium

Answer:



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12. The flux added during extraction of Iron from hematite are its? Silica ,Calcium carbonate ,Sodium carbonate ,Alumina

A. Silica

B. Calcium carbonate

C. Sodium carbonate

D. Alumina

Answer:



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13. Which of the following exhibits the largest number of oxidation states? Zr,V,Mn,Ni

A. Zr

B. V

C. Mn

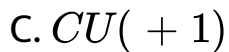
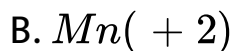
D. Ni

Answer:



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14. Which of the following has all of its electrons paired? Cr^{2+} , Mn^{2+} , Cu^{1+} , Ni^{2+} .



Answer:



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15. Which of the following has the highest I.E.?

Ti, Mn, Fe, Ni

A. Ti

B. Mn

C. Fe

D. Ni

Answer:



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16. Which of the following has largest atomic radius?

Mn,Cr,Ti,Co

A. Mn

B. Cr

C. Ti

D. Co

Answer:



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17. Which of the following has the lowest melting point? V, Cr, Fe, Mn

A. V

B. Cr

C. Fe

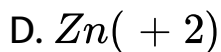
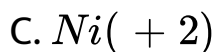
D. Mn

Answer:



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18. Which of the following has the highest magnetic moment?

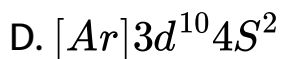
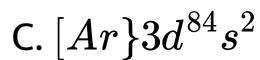
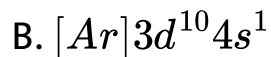
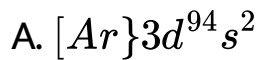


Answer:



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19. The electronic configuration of copper is



Answer:



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



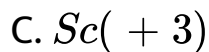
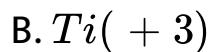
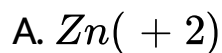


Answer:



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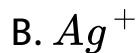
21. Which of the following ions has the highest magnetic moment?



Answer:

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22. Which of the following is paramagnetic?



Answer:

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23. Which of the following does not belong to group 10?

A. Nickel

B. palladium

C. Platinum

D. Iridium

Answer:



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24. The stable oxidation state of cerium is

A. +4

B. +3

C. +2

D. +5

Answer:



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25. The highest oxidation state shown by manganese in its compounds is

A. +7

B. +6

C. +5

D. +8

Answer:



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26. Which of the following has maximum number of unpaired electrons?

A. Mg^{+2}

B. Ti^{+3}

C. V^{+3}

D. Fe^{+2}

Answer:



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27. Which of the following elements belong to the second transition Mo,W,Cu, Hf

A. Mo

B. W

C. Cu

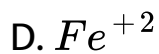
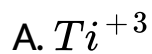
D. Hf

Answer:



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28. Which of the following ions are white?



Answer:



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29. Which of the following is an incorrect statement in logic ?

A. Ce

B. Pm

C. La

D. Lu

Answer:



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30. Which of the following is the purest form of iron?

A. Cast iron

B. wrought iron

C. steel

D. Haematite

Answer:



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31. Bronze is an alloy as

A. copper and tin

B. copper and zinc

C. Nickel and chromium

D. Fe and zinc

Answer:



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32. Copper and zinc metals are found inalloy

A. Bronze

B. Brass

C. Stainless steel

D. Nichrome

Answer:





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33.is used in making statues, medals and trophies

A. Bronze

B. Brass

C. Stainless steel

D. Nic

Answer:



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34.is used to manufacture of steel

A. Iron carbide

B. Tungsten

C. Aluminium

D. Bronze

Answer:



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35.is used as catalyst for oxidation of SO_2 to SO_3 in contact process.

A. MnO_2

B. V_2O_5

C. Mn

D. Ni

Answer:



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36. is used to convert inedible oils into solid fat for production of margarine

A. Ni

B. V_2O_5

C. Cu

D. MnO_2

Answer:



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37.is used in manufacture of ammonia by Haber's process

A. Mo/Fe

B. Co/Th

C. Ni

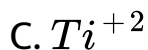
D. V_2O

Answer:



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38. Which of the following $Mn^{+2}, Ni^{+2}, Ti^{+2}, V^{+2}$ has the smallest radii?



Answer:



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39. Which of the following elements belong to second transition series?

A. Mo

B. W

C. Pd

D. Hf

Answer:



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40. Which of the following is not radioactive

A. Pm

B. Pa

C. Am

D. U

Answer:



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41. Which of the following ions are white?

A. Ti^{+3}

B. Cu^{+2}

C. Cd^{+2}

D. Sc^{+3}

Answer:

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42. How will you prepare potassium permanganate from manganate.

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43. Define a mineral

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44. Give any two uses of $KMnO_4$



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45. What is lanthanide contraction? Why is it observed?



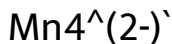
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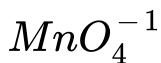
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