



CHEMISTRY

BOOKS - SHARAM PUBLICATION

D AND F BLOCK ELEMENTS

Exercise

1. Which of the following factor may be regarded as the main cause of lanthanide contraction ?

A. Poor shielding of one of the 4f electrons

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B. Effective shielding of one of the 4f electrons by another in the sub shell

C. Poor shielding of 5d electron by 4f electrons

D. Greater shielding of 5d electrons by 4f electrons.

Answer:



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2. Which element does not show variable oxidation state ?

A. *Sc*

B. *V*

C. *Fe*

D. *Hg*

Answer:



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3. Which of the following oxidation state-is the most common among the lanthanoids?

A. 4

B. 2

C. 5

D. 3

Answer:



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4. In the first transition series which of the following has lowest enthalpy of atomisation ?

A. *Sc*

B. *Cu*

C. *Ti*

D. *Zn*

Answer:



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5. Which of the following is not a transition element ?

A. *Zn*

B. *Ru*

C. *Ag*

D. *Pb*

Answer:



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6. Formation of interstitial compounds make the transition metal :

A. more soft

B. more ductile

C. more metallic

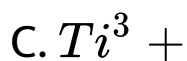
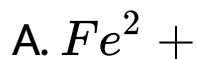
D. more hard and brittle

Answer:



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7. Which of the following ion is colourless in aqueous solution ?



Answer:



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8. Which of the following statement about transition elements is correct ?

A. They show variable oxidaton states

B. All ions are coloured

C. They exhibit diamagnetic and paramagnetic properties

D. They exhibit catalytic property

Answer:



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9. Permanent magnets are generally made of alloys of :

A. *Fe*

B. *Co*

C. *Ni*

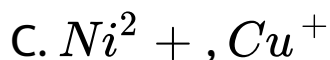
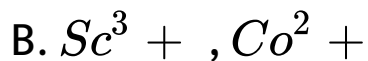
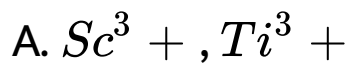
D. None of these

Answer:



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



Answer:



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11. The main reason for the large number of oxidation states exhibited by actinoids than the corresponding lanthanoids is

A. Large atomic size of actinoids than the lanthanoids

B. Greater reactivity of actinoids than lanthanoids

C. More energy difference between 5 f and 6d orbitals than between 4f and 5d orbitals.

D. Less energy difference between 5f and 6d orbitals than between 4f and 5d orbitals

Answer:



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12. Among the following out electronic configuration of atoms the highest oxidation state is achieved by which of the following :

A. $(n - 1)d^3ns^2$

B. $(n - 1)d^5ns^2$

C. $(n - 1)d^8ns^2$

D. $(n - 1)d^5ns^1$

Answer:



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13. A reduction in atomic size with increase in atomic number is a characteristic of elements of

A. d- block

B. f- block

C. radioactive series

D. high atomic masses

Answer:



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14. The magnetic character of transition elements of its ion is due to

- A. the presence of unpaired electrons
- B. presence of paired electrons
- C. d-d transition
- D. All of these

Answer:



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15. Which of the following transition metals show the maximum oxidation state ?

A. *Fe*

B. *Mn*

C. *Cr*

D. *Cu*

Answer:



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16. Among the following series of transition metal ions the one where all the metal ions

have $3d^2$ configuration is - (At No $T_i = 22$,

$V=23$, $Cr = 24$, $Mn = 25$)

A. Ti^{2+} , V^{3+} , Cr^{4+} and Mn^{5+}

B. Ti^{3+} , V^{2+} , Cr^{3+} and Mn^{4+}

C. Ti^{4+} , V^{4+} , Cr^{6+} and Mn^{7+}

D. Ti^{4+} , V^{3+} , Cr^{2+} and Mn^{3+}

Answer:



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17. Which of the following d- block elements has half filled penultimate d- sub shell as well as half filled valence s- sub shell ?

A. *Cr*

B. *Cu*

C. *Au*

D. *Pt*

Answer:



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18. The catalyst used for olefin polymerisation is

A. Zeigler - Natta catalyst

B. Wilkinson's catalyst

C. Raney nickel catalyst

D. Merrified resin

Answer:



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19. The malleability and ductility of metals can be accounted due to

A. the capacity of layer of metal ions to slide over the other

B. the interaction of electrons with metal ions of the lattice

C. the presence of electrostatic force

D. the crystalline structure of the metal

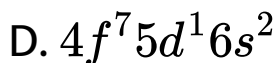
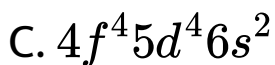
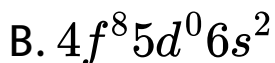
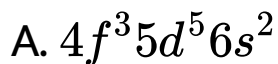
Answer:



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20. Write down the electronic configuration of gadolinium (Gd).

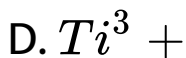
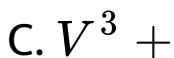
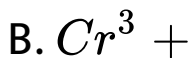
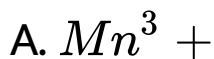
Its atomic number is 64.



Answer:



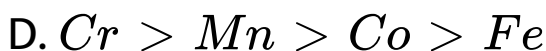
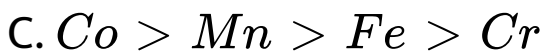
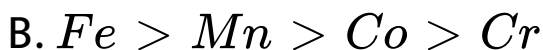
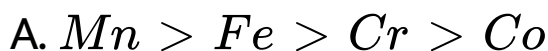
21. Which of the following ions is most stable in aqueous solution ?



Answer:



22. For the four successive transition elements (Cr, Mn, Fe and Co), the stability of +2 oxidation state will be in the following order.



Answer:



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23. Write the electronic configuration Nickel.



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24. Why are most of the transition metal compounds are paramagnetic ?



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25. Which of the d - block elements are not regarded as transition element ?



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26. Why Fe^{3+} is more stable than Fe^{2+} ?



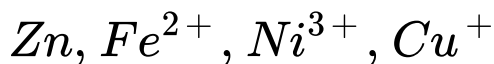
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27. Why are scandium salts colourless ?



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28. Out of the following which one has more number of unpaired electrons ?



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29. Why enthalpy of atomisation Zn is the lowest in the first transition series ?



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30. Between Sc^{3+} and Cr^{3+} ion which will give colourless compound.



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31. What is the general electronic configuration of d-block elements ?



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32. Which metals form the alloy brass ?





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33. When Ethylene reacts with alkaline solution of $KMnO_4$ a dihydric alcohol is formed .What is it ?



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



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35. Write the formula of one complex ion of *Cu* and *Ni*.



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36. Why do transition elements exhibit variable oxidation states ?



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37. Fill in the blanks : The first transition series starts with the elementand ends with the element



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38. Fill in the blanks : The only metal which has a positive standard reduction potential in the first transition series is



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39. Fill in the blanks : The transition metals in which vacant spaces are occupied by small atoms such as hydrogen, carbon etc. are called



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40. Fill in the blanks : f- block elements are known as



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41. Fill in the blanks :Philosopher's Wool is the name of the compound



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42. In 1st row transition series the highest oxidation number is shown by



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43. Fill in the blanks :The reaction in which the same substance undergoes oxidation and

reduction is called



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44. Name the metal present in haemoglobin



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45. Fill in the blanks :The d- block elements are known as



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46. Fill in the blanks :The catalyst used in Haber 's process of manufacture of ammonia is



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47. In the 1st row transition element , the metal that forms colourless compounds is



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48. Which metal is commonly used for galvanising iron?



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49. Fill in the blanks :The electronic configuration of Cu^+ is



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50. Discuss the general characteristics properties of transition elements.



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51. What are alloys ? Name two alloys.



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52. Cu^+ is diamagnetic , but Cu^{2+} is paramagnetic . Why ?



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53. Why do transitional elements form complex compounds ?



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54. Why are the salts of Zn , Cd and Hg are colourless.



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55. Why Fe^{2+} forms Fe^{3+} , but Mn^{2+} does not form Mn^{3+} ?



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56. Why do transition metal ions have high enthalpy of hydration?



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57. Why the properties of third transition series are very similar to second transition series ?



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58. How would you account for the fact that the transition metals and their compounds are good catalysts in many process ?



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59. Scandium forms no coloured ions, yet it is regarded as a transition elements. Why ?



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60. The paramagnetic character in 3d-transition series increases up to manganese and then decreases. Give reason.



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61. Explain why Zn shows only +2 oxidation state ?



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62. Manganese exhibits highest oxidation state of +7. Give reason.



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63. Explain, why Cu^+ ion is not stable in aqueous solution.



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64. Why does copper not displace hydrogen from acids ?



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65. Reactivity of transition elements decreases almost regularly from Sc to Cu. Why ?



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66. An ion has three unpaired electrons . Calculate its magnetic moment.



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67. Explain, why Cu^+ ion is not stable in aqueous solution.



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68. Predict which of the following will be coloured in aqueous solution giving reason.

$(Cu^+, V^{3+}, Zn^{2+}, Sc^{3+}, Fe^{3+}, Co^{2+})$



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69. Why Zn^{2+} salts are white while Ni^{2+} and Cu^{2+} salts are coloured ?



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70. What is the basic difference between the electronic configuration of transition and inner transition elements.



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71. Which element of first transition series has highest second ionization enthalpy ?



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72. Discuss the general characteristics properties of transition elements.



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