



CHEMISTRY

BOOKS - NEET PREVIOUS YEAR (YEARWISE + CHAPTERWISE)

TRANSITION ELEMENTS D- AND F- BLOCK ELEMENTS

Mcq Types

1. The reason for greater range of oxidation state in actinoids is attributed to:

A. the radioactive number of actinoids

B. actinoid contraction

C. 5f, 6d and 7s levels having comparable energies

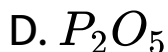
D. 4f and 5d levels being close in energies

Answer: C



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2. Name the gas that can readily decolourise acidified $KMnO_4$ solution:

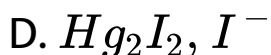
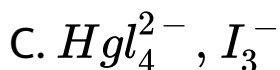
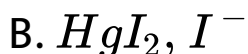
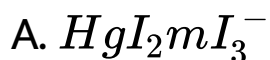


Answer: B



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3. $HgCl_2$ and I_2 both when dissolved in water containing I^- ions the pair of species formed is:



Answer: C



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4. When copper is heated with conc. HNO_3 it produces?

- A. $Cu(NO_3)_2$ and NO
- B. $Cu(NO_3)_2$, N_2O
- C. $Cu(NO_3)_2$ and N_2O
- D. $Cu(NO_3)_2$ and NO_2

Answer: D



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5. When SO_2 is passed through acidified $K_2Cr_2O_7$ solution

A. The solution is decolourised

B. SO_2 is reduced

C. Green $Cr_2(SO_4)$ is formed

D. The solution turns blue

Answer: C



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6. The electronic configuration of Eu (Atomic No. 63), Gd (Atomic No. 64) and Tb (Atomic No. 65) are:

A. $[Xe]4f^65d^16s^2$ and $[Xe]4f^96s^2$

B. $[Xe]4f^65d^16s^2$, $[Xe]4f^75d^16s^2$ and

$$[Xe]4f^85d^16s^2$$

C. $[Xe]4f^76s^2$, $[Xe]4f^75d^16s^2$ and

$$[Xe]4f^96s^2$$

D. $[Xe]4f^76s^2$, $[Xe]4f^86s^2$ and

$$[Xe]4f^85d^16s^2$$

Answer: C



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7. 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

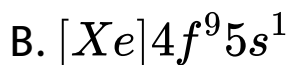
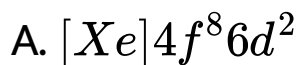
D. Ce^{+4} solution are widely used as oxidising agent in volumetric analysis

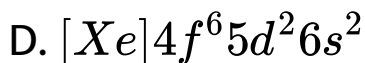
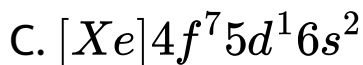
Answer: C



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



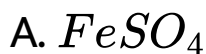


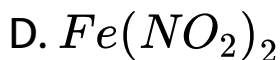
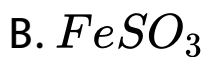
Answer: C



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9. Assuming complete ionization, same moles of which of the following compounds will require the least amount of acidified $KMnO_4$ for complete oxidation ?





Answer: A



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

A. Ti(22) and Zr(40)

B. Zr(40) and Nb(41)

C. Zr (40)and Hf(72)

D. Zr(40) and Ta(73)

Answer: C



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11. Which of the following processes does not involve oxidation of iron ?

A. Rusting of iron sheets

B. Decolourisation of blue $CuSO_4$ solution
by iron

C. Formation of $Fe(CO)_5$ from Fe

D. Liberation of H_2 from steam by iron at
high temperature.

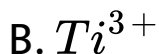
Answer: C



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12. Magnetic moments $2.84B$. M is given by :

(At. nos. $\text{Ni} = 28$, $\text{Ti} = 22$, $\text{Cr} = 24$, $\text{Co} = 27$).

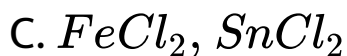
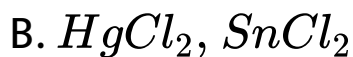
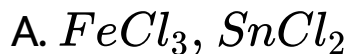


Answer: A



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13. The pair of compounds that can exist together is:



Answer: C



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14. In acidic medium, H_2O_2 changes $Cr_2O_7^{2-}$ to CrO_5 which has two $(-O-O-)$ bonds. Oxidation state of Cr in CrO_5 is

A. +5

B. +3

C. +6

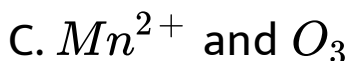
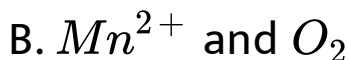
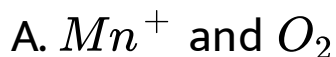
D. -10

Answer: C



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15. The reaction of aqueous $KMnO_4$ with H_2O_2 in acidic conditions gives



Answer: B



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16. Reason of lanthanoid contraction is

A. negligible screening effect of f-orbitals

B. increasing nuclear charge

C. decreasing nuclear charge

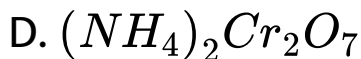
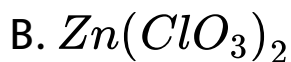
D. decreasing screening effect

Answer: A



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



Answer: D



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18. Which of the following lanthanoid ions is diamagnetic? (Atomic number of

$Ce = 58$, $Sm = 62$, $Eu = 63$, $Yb = 70$]



Answer: D



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19. Which of the following statements about the interstitial compounds is incorrect?

- A. They region metallic conductivity
- B. They are chemically reactive
- C. They are much harder than the pure metal
- D. They have higher melting points than the pure metals.

Answer: B



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20. Identify the alloy containing a non metal as a constituent in it

A. Invar

B. Steel

C. Bell-metal

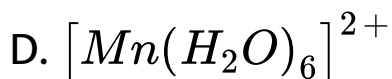
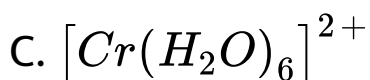
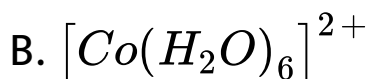
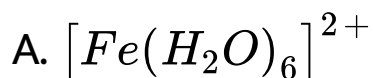
D. Bronze

Answer: B



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21. The d-electron configurations of Cr^{2+} , Mn^{2+} , Fe^{2+} and Co^{2+} are d^4 , d^5 , d^6 and d^7 respectively. Which one of the following will exhibit minimum paramagnetic behaviour?



Answer: B



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

(*At. Nos. Cr = 24, Mn = 25, Fe = 26, Co = 27*)

A. $Fe > Mn > Co > Cr$

B. $Co > Mn > Fe > Cr$

C. $Cr > Mn > Co > Fe$

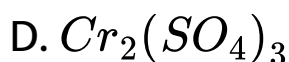
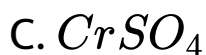
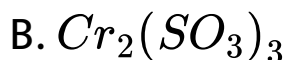
D. $Mn > Fe > Cr > Co$

Answer: D



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23. Acidified $K_2Cr_2O_7$ solution turns green when Na_2SO_3 is added to it. This is due to the formation of

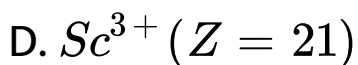
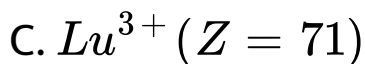
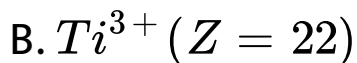
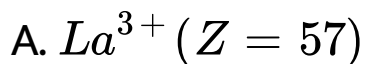


Answer: D



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24. Which of the following ions will exhibit colour in aqueous solution ?



Answer: B



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25. Which one of the following ions has electronic configuration $[Ar]3d^6$?

(*At. Nos. Mn = 25, Fe = 26, Co = 27, Ni = 28*)

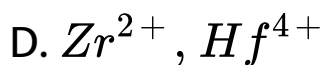
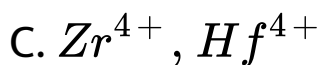
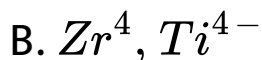
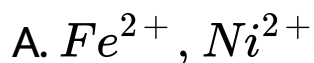


Answer: D



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



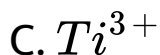
Answer: C



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

(*At. No. Ti* = 22, *V* = 23, *Cr* = 24, *Mn* = 25)



Answer: D



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28. Identify the incorrect statement among the following:

A. There is a decrease in the radii of the atoms or ions as one proceeds from La or Lu

B. Lanthanide contraction is the accumulation of successive shrinkages

- C. As a result of lanthanide contraction, the properties of 4d series of the transition elements have no similarities with the 5d series of elements
- D. Shielding power of 4f electrons is quite weak

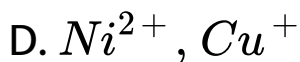
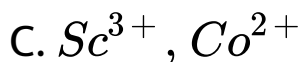
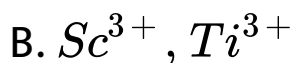
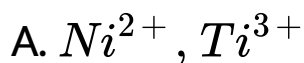
Answer: C



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29. In which of the following pairs both the ions are coloured in aqueous solution? (Atomic number,

$Sc = 21, Ti = 22, Ni = 28, Cu = 29, Co = 27$)

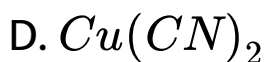
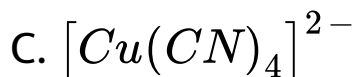
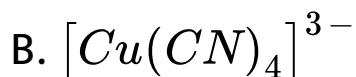


Answer: A



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30. Copper sulphate dissolves in excess of KCN to give :



Answer: B



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31. More number of oxidation states are exhibited by the actinoids than by the lanthanoids. The main reason for this is

A. more energy difference between 5f and 6d orbitals than that between 4f and 5d-orbitals

B. lesser energy difference between 5f and 6d-orbitals than that between 4f and 5d-orbitals

C. greater metallic character of the lanthanides than that of the corresponding actinides

D. more active nature of the actinides.

Answer: B



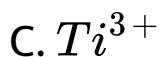
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32. The aqueous solution containing which one of the following ions will be colourless

(Atomic

number

$$Sc = 21, Fe = 26, Ri = 22, Mn = 25)$$



Answer: A



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33. Four successive members of the first row transition elements are listed below with their atomic number. Which one of them is expected to have the highest third ionisation enthalpy ?

A. Vanadium ($Z=23$)

B. Chromium ($Z=24$)

C. Iron ($Z=26$)

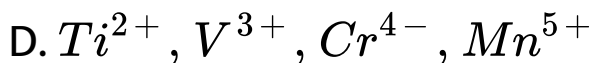
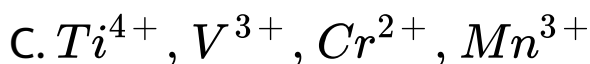
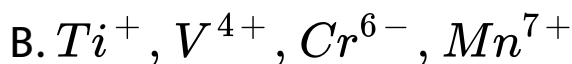
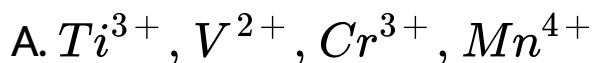
D. Manganese ($Z=25$)

Answer: D



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



Answer: D



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35. Lanthanides are

A. 14 elements in the sixth period (At.no.=90 to 103) that are filling 4f sub-level

B. 14 elements in the seventh period (At.no.=90 to 103) that are filling 5f sub-level

C. 14 elements in the sixth period (At.no.=58 to 71) that are filling 4f sub-level).

D. 14 elements in the seventh period (At. No.=58 to 71) that are filling 4f sub-level

Answer: C



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36. Which one of the following characteristics of the transition metals is associated with their catalytic activity?

A. Colour of hydrated ions

B. Variable oxidation states

C. High enthalpy of atomisation

D. Paramagnetic behaviour

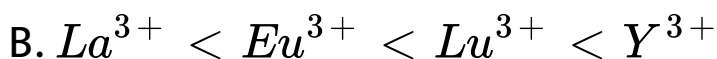
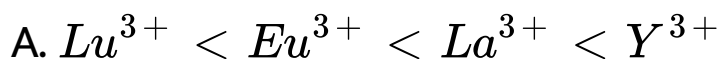
Answer: B

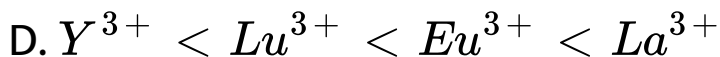
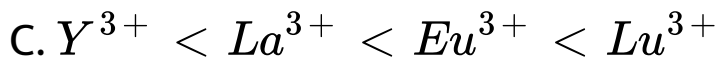


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37. The correct order of ionic radii Y^{3+} , La^{3+} , Eu^{3+} and Lu^{3+} is

(*AT. No*: $Y = 39$, $La = 57$, $Eu = 63$, $Lu = 71$)



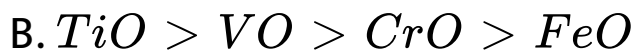


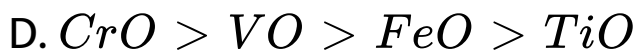
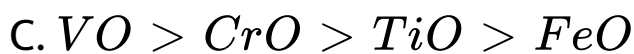
Answer: D



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38. The basic character of the transition metal monoxide follows the order



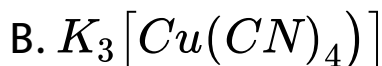
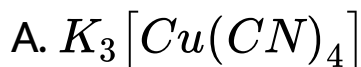


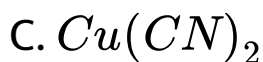
Answer: B



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39. $CuSO_4$ when reacts with KCN forms $CuCN$ which is insoluble in water. It is soluble in excess of KCN due to the formation of the complex.





Answer: B



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40. In the silver plating of copper, $K[Ag(CN)_2]$

is used instead of $AgNO_3$. The reason is

A. a thin layer of Ag is formed on Cu

B. more voltage is required

C. Ag^+ ions are completely removed from solution

D. Less availability of Ag^+ ions, as Cu cannot displace Ag from $[Ag(CN)_2]^-$ is

Answer: D



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41. General electronic configuration of lanthanides is

A. $(n - 2)f^{1-14}(n - 1)s^2p^6d^{0-1}ns^2$

B. $(n - 2)f^{10-14}(n - 1)d^{0-1}ns^2$

C. $(n - 2)f^{0-14}(n - 1)d^{10}ns^2$

D. $(n - 2)d^{0-1}(n - 1)f^{1-14}ns^2$

Answer: A



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42. In the following transition metals, the maximum number of oxidation states are exhibited by

A. chromium ($Z=24$)

B. manganese ($Z=25$)

C. Iron($Z=26$)

D. titanium ($Z=22$)

Answer: B



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43. Which of the following statements is not correct?

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

B. In lanthanide series, ionic radius of Ln^{3+} ion decreases

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

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

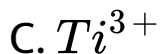
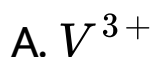
Answer: A



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44. Which one of the following forms a colourless solution in aqueous medium ?

(Atomic number : $Sc = 21$, $Ti = 22$, $V = 23$, and $Cr = 24$)

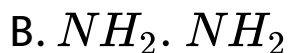
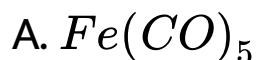


Answer: D



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45. In which of the following compounds transition metal has zero oxidation state ?



Answer: A



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46. Bell metal is an alloy of

A. $Cu + Pb$

B. $Cu + Sn$

C. $Cu + Zn$

D. $Cu + Ni$

Answer: B



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47. Oxidation state of in Fe_3O_4 is

A. $\frac{3}{2}$

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

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

D. $\frac{8}{3}$

Answer: D



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48. Which of the following has more number of unpaired d-electrons ?

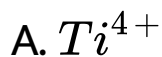


Answer: B



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49. Which one of the following ionic species will impart colour to an aqueous solution ?



Answer: D



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50. Which of the following elements shows maximum number of different oxidation states in its compounds ?

A. Eu

B. La

C. Gd

D. Am

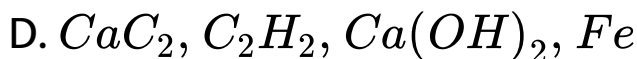
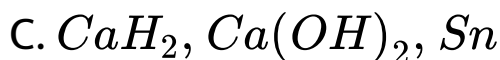
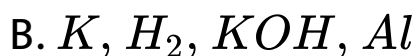
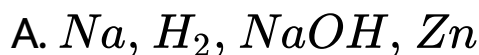
Answer: D



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51. When a substance A reacts with water it produces a combustible gas B and a solution of substance C in water. When another substance

D reacts with this solution of C, it also produces the same gas B on warming but D can produce gas B on reaction with dilute sulphuric acid at room temperature. A imparts a deep golden yellow colour a smokeless flame to Bunsen burner. A,B,C, and D respectively are :

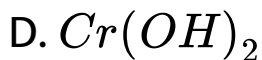
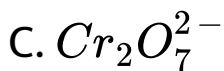
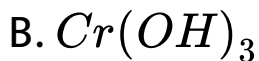


Answer: A



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52. $K_2Cr_2O_7$ on heating with aqueous NaOH gives



Answer: A



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53. The lanthanide contraction is responsible for the fact that

- A. Zr and Yt have about the same radius
- B. Zr and Nb have smaller oxidation state
- C. Zr and Hf have about the same radius
- D. Zr and Zn have the same oxidation state.

Answer: C



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54. Which of the following elements is responsible for oxidation of water to O_2 in biological processes ?

A. Fe

B. Cu

C. Mn

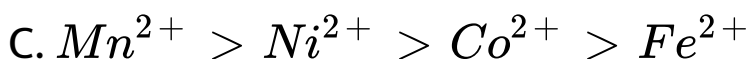
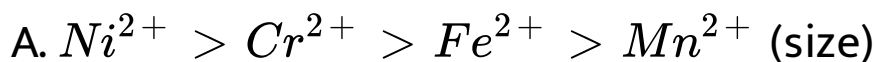
D. Mo

Answer: C

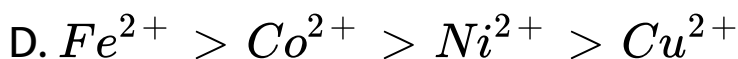


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55. Which of the following does not represent the correct order of the properties indicated?



(unpaired electron)



(unpaired electron)

Answer: A



56. Which of the following may be considered to be an organometallic compound?

A. Nickel tetracarbonyl

B. Chlorophyll

C. $K_3[Fe(C_2O_4)_3]$

D. $[Co(en)_3Cl_3]$

Answer: B



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57. Cuprous compounds such as CuCl , CuCN and CuSCN are the only salts stable in water due to

A. high hydration energy of Cu^+ ions

B. their inherent tendency not to disproportionate

C. diamagnetic nature

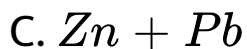
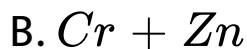
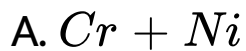
D. insolubility in water.

Answer: A



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58. Stainless steel contains iron and



Answer: A



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59. By passing H_2S in acidified $KMnO_4$ solution we get

A. S

B. K_2S

C. MnO_2

D. K_2SO_3

Answer: A



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60. Among the lanthanides the one obtained by synthetic method is

A. Lu

B. Pm

C. Pr

D. Gd

Answer: B



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61. Actinides

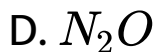
- A. are all synthetic elements
- B. include elements 104
- C. have any short lived isotopes
- D. have variable valency

Answer: D



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62. When $(NH_4)_2Cr_2O_7$ is heated, the gas evolved is



Answer: A



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63. The common oxidation states of Ti are

A. + 2, + 3

B. + 3, + 4

C. 3, - 4

D. + 2, + 3, + 4

Answer: B



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64. The most durable metal plating on iron to protect it against corrosion is

A. nickel plating

B. tin plating

C. copper plating

D. zinc plating

Answer: D



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65. When $CuSO_4$ is electrolysed, using Pt electrodes

A. Copper is liberated at cathode, sulphur at anode

B. Copper is liberated at cathode, oxygen at anode

C. Sulphur is liberated at cathode, oxygen at anode

D. Oxygen is liberated at cathode, copper at anode.

Answer: B



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66. The transition elements have a general electronic configuration:

A. $ns^2 np^6 nd^{1-10}$

B. $(n - 1)d^{1-10}, ns^{0-2}, np^{0-6}$

C. $(n - 1)d^{1-10}, ns^{1-2}$

D. $nd^{1-10} ns^2$

Answer: C



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67. Cinnabar is an ore of

A. Hg

B. Cu

C. Pb

D. Zn

Answer: A



68. While extracting an element from its ore, the ore is grind and leached with dil KCN solution to form the soluble product potassium argentocyanide. The element is

A. lead

B. chromium

C. manganese

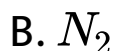
D. silver

Answer: D



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69. Nitriding is a process of hardening steel by treating it in an atmosphere of



Answer: A



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70. Photographic plates and films have an essential ingredient of

- A. silver nitrate
- B. silver bromide
- C. sodium chloride
- D. oleic acid

Answer: B



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71. The oxidation state of Cr in $K_2Cr_2O_7$ is:

A. + 5

B. + 3

C. + 6

D. + 7

Answer: C



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72. Which one of the following is an ore of silver?

A. Argentite

B. Stibnite

C. Haematite

D. Bauxite

Answer: A



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73. The metal which corrodes readily in moist air, is

A. Gold

B. Silver

C. Nickel

D. Iron

Answer: D



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