



CHEMISTRY

BOOKS - FULL MARKS CHEMISTRY

(TAMIL ENGLISH)

TRANSITION AND INNER TRANSITION ELEMENTS

Textbook Evaluation

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: C



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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

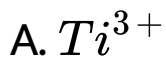
D. none of these

Answer: A



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



Answer: C



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

A. 5.92BM

B. 2.80BM

C. 8.95BM

D. 3.90BM

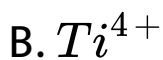
Answer: A



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5. Which of the following compounds is colourless?

A. Fe^{3+}



Answer: B



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

to

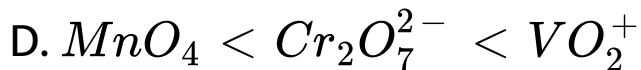
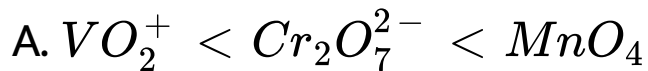
- A. their magnetic behaviour
- B. their unfilled d orbitals
- C. their ability to adopt variable oxidation states
- D. their chemical reactivity

Answer: C



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7. The correct order of increasing oxidizing power in the series

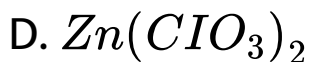
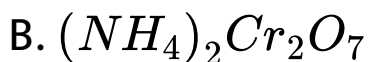


Answer: A



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



Answer: B



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9. 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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10. 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

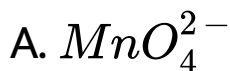
D. $K_2Cr_2O_7$ solution becomes yellow on increasing the pH beyond

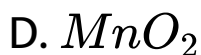
Answer: B



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11. Permanganate ion changes to..... in acidic medium.





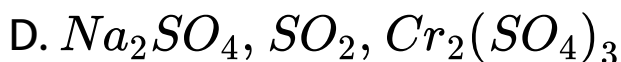
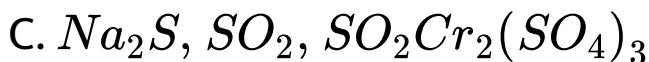
Answer: B



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12. 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.....

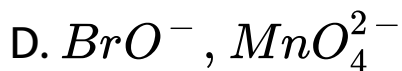
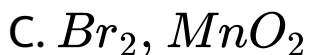
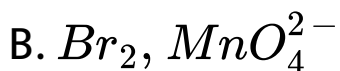
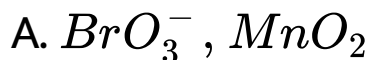


Answer: B



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13. MnO_4^- react with Br in alkaline pH to give



Answer: A



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14. 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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15. The number of moles of acidified KMnO_4 , required to oxidize 1 mole of ferrous oxalate (FeC_2O_4) is

A. 5

B. 3

C. 0.6

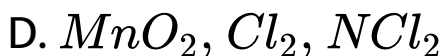
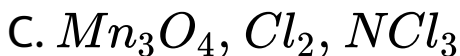
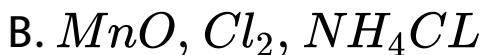
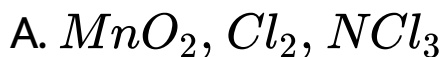
D. 1.5

Answer: C



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16. When a brown compound of Mn (A) is treated with HCl, it gives a 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



Answer: A



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17. 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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18. Which of the following lanthanoid ions is diamagnetic?

A. Eu^{2+}

B. Yb^{2+}



Answer: B



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19. 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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20. 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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21. The most common oxidation state of actinoids is

A. 2

B. 3

C. 4

D. 6

Answer: C



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22. 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, LT

Answer: A



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23. 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 than lanthanide series

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

Answer: A



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24. What are transition metals? Give four examples



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



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26. What are inner transition elements?

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

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28. What are actinoides? Give three examples.



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



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



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31. Describe the preparation of potassium dichromate.



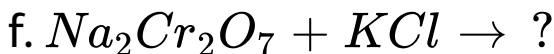
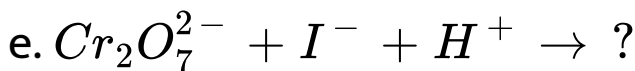
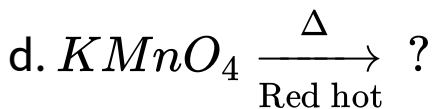
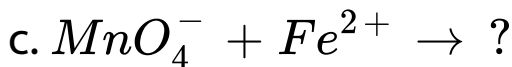
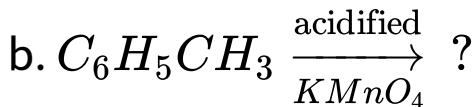
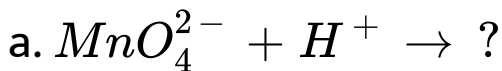
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32. What is lanthanide contraction and what are the effects of lanthanide contraction?



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33. Complete the following



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34. What are interstitial compounds?





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



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



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



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38. Which is more stable? Fe^{3+} or Fe^{2+} - explain.



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39. Explain the variation in $E_{M^{2+} / M^{3+} + 3d}$ series



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40. Compare lanthanides and actinides.



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





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



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



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

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

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46. Why do zirconium and Hafnium exhibit similar properties?



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



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48. The $E_{M^{2+}/M}^0$ value for copper is positive.

Suggest a possible reason for this.



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

Ti^{2+} , V^{3+} , Se^{4+} , Cu^+ , Sc^{3+} , Fe^{3+} , Ni^{2+} ,

and Co^{3+}



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



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



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



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53. Transition metals show high melting points why?



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Evaluate Yourself

1. Compare the stability of Ni^{4+} and Pr^{4+} from their ionisation enthalpy values.

IE	Ni	Pt
I	737	864
II	1753	1791
III	3395	2800
IV	5297	4150

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2. Why iron is more stable in +3 oxidation state than in +2 and the reverse is true for Manganese?

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Additional Questions | Choose The Correct Answer

1. The elements whose atom has incomplete d sub-shell are called

- A. s-block element
- B. Alkali metals
- C. transition elements
- D. Representative elements

Answer:



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2. Which one of the following is the other name of d-block elements?

A. Chalcogens

B. Halogens

C. Inner-transition elements

D. Transition elements

Answer:



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3. Which metals play an important role in the development of human civilization?

A. Al and Mg

B. Na and K

C. Fe and Cu

D. Mn and Ni

Answer:



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4. Which metal is used in manufacturing artificial joints?

A. Molybdenum

B. Titanium

C. Tungsten

D. Iron

Answer:



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5. Which transition metal is applied in the manufacturing of boiler plants?

A. Iron

B. Copper

C. Aluminium

D. Molybdenum

Answer:



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6. The metal cobalt is present in

A. Vitamin-A

B. Vitamin- B_1

C. Vitamin- B_{12}

D. Vitamin- B_6

Answer:



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7. Consider the following statements

(i) Transition metals occupy group-3 to group-12 of the modern periodic table

(ii) Representative elements occupy group-3 to group-12 of the modern periodic table.

(iii) Except group-11 elements of all transition metals are hard.

(iv) d-block elements are mostly non-metals.

Which of the above statements is/ are incorrect?

A. ii and iv

B. i and iii

C. iii only

D. i only

Answer:



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8. Consider the following statements.

(i) d-block elements composed of 3d series, Sc to Zn (4th period).

(ii) 4d series composed of Y to Cd.

(iii) 5d series composed of La, Hf to Mercury.

(iv) d-block elements composed of 4d series Y to Cd.

Which of the above statements is/ are incorrect.

A. i and iv

B. i, ii and ii

C. iii and iv

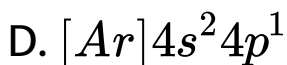
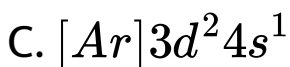
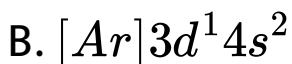
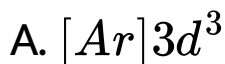
D. iv only

Answer:



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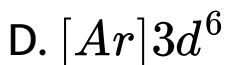
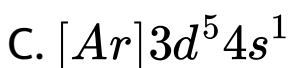
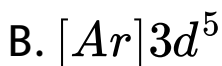
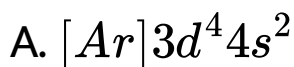
9. Which of the following is the correct electronic configuration of Sc ($Z = 21$)?



Answer:



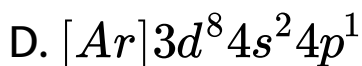
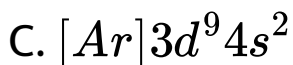
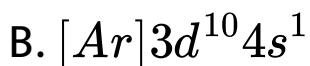
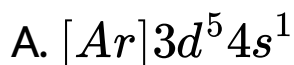
10. The correct electronic configuration of Cr is.....



Answer:



11. Which of the following is the correct electronic configuration of copper?



Answer:

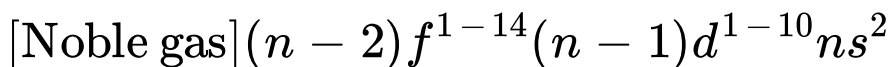


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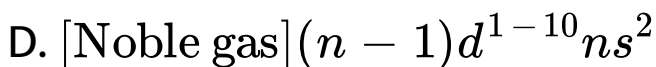
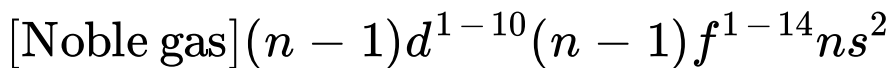
12. Which one of the following is the general electronic configuration of transition elements?



B.



C.



Answer:



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13. Which one of the following transition element has maximum oxidation states?

A. Manganese

B. Copper

C. Scandium

D. Titanium

Answer:



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14. Consider the following statements.

(i) In 3d series, the middle element Mn has +2 to +7 oxidation states.

(ii) The oxidation state of Ru and Os is +8.

(iii) Scandium has six different oxidation states.

Which of the above statements is/ are not correct?

A. i and ii

B. ii only

C. i only

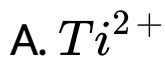
D. iii only

Answer:



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15. Which one of the following elements show high positive electrode potential?

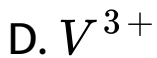
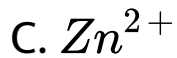
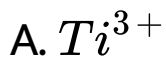


Answer:



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16. Which one of the following is diamagnetic in nature?

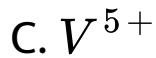
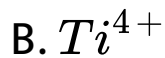


Answer:



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17. Which one of the following is paramagnetic in nature?

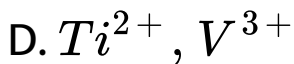
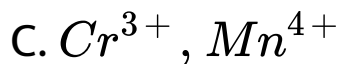
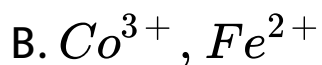
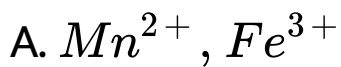


Answer:



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18. Which of the following pair has maximum number of unpaired electrons?

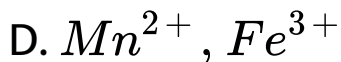
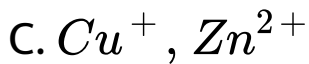
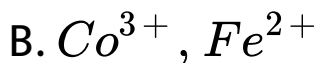
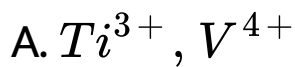


Answer:



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19. Which of the following pair has d^{10} electrons?



Answer:



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20. Which of the following is used as a catalyst in the manufacture of sulphuric acid from SO_3

A. V_2O_5

B. Rh-Ir

C. Ni

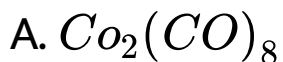
D. Fe

Answer:

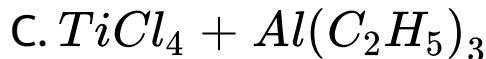


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21. Which one of the following is Zeigler-Natta catalyst?



B. Rh/Ir complex



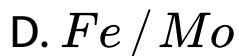
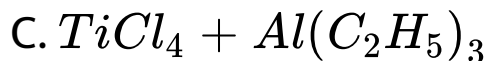
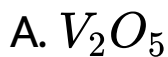
D. Fe / Mo

Answer:



View Text Solution

22. Which one of the following is used as a catalyst in the polymerisation of propylene?



Answer:



View Text Solution

23. Consider the following statements.

(i) Transition metal hydrides are used as powerful oxidising agents.

(ii) Metallic carbides are chemically active.

(iii) Interstitial compounds are hard and show electrical and thermal conductivity.

Which of the above statements is/ are incorrect?

A. i and ii

B. ii and iii

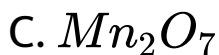
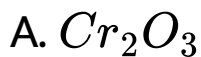
C. iii only

D. i only

Answer:



24. Which one of the following oxide is covalent?



Answer:



25. Which one of the following oxide is amphoteric in nature?

A. CrO

B. Cr_2O_3

C. Mn_2O_7

D. MnO

Answer:



View Text Solution

26. Which one of the following is used to identify chloride ion in inorganic qualitative analysis?

A. Barium chloride test

B. Chromyl chloride test

C. Brown ring test

D. Ammonium molybdate test

Answer:



View Text Solution

27. Which one of the following is the formula of chromyl chloride?



Answer:



View Text Solution

28. Which ore is used to prepare potassium permanganate?

A. Pyrolusite

B. Chromite

C. Argentite

D. Cuprite

Answer:



View Text Solution

29. Which one of the following geometry is possessed by permanganate ion?

A. Pyramidal

B. Tetrahedral

C. Octahedral

D. linear

Answer:



View Text Solution

30. The hybridisation state of Mn^{7+} is permanganate ion is.....

- A. sp_2 hybridisation
- B. dsp^2 hybridisation
- C. d^2sp^3 hybridisation
- D. sp^3 hybridisation

Answer:



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31. Which one of the following is known as Baeyer's reagent?

A. Cold dilute alkaline $KMnO_4$

B. Chromyl Chloride

C. Acidified potassium dichromate

D. Acidified potassium manganate

Answer:



View Text Solution

32. Which reagent is used in the conversion of ethylene into ethylene glycol?

A. Chromyl chloride

B. Zeigler-Natta catalyst

C. Cold dilute alkaline $KMnO_4$

D. Acidified $K_2Cr_2O_7$

Answer:



View Text Solution

33. Baeyer's reagent is used to detect.....
unsaturation in an organic compound.

A. Chloride ion

B. unsaturated organic compound

C. Sulphate ion

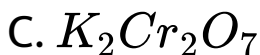
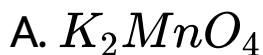
D. Chromate ion

Answer:



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34. Which one of the following is used for the estimation of ferrous salts, oxalates, hydrogen peroxide and iodides?

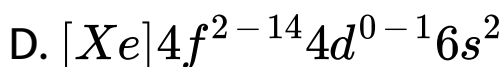
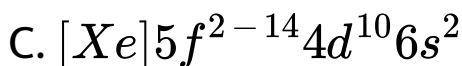
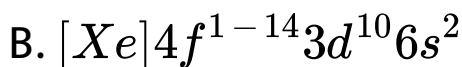
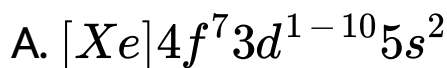


Answer:



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35. Which of the following is the general electronic configuration of lanthanoids?

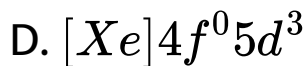
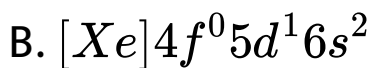
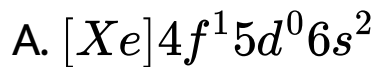


Answer:



View Text Solution

36. The expected electron configuration of La (Z= 57) is

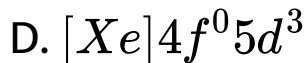
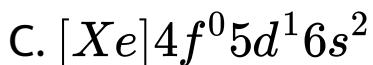
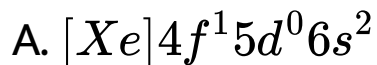


Answer:



View Text Solution

37. The actual electron configuration of La(Z=57) is



Answer:



View Text Solution

38. Which one and of the following lanthanoids have completely filled Lu 4f orbital?

A. Gd and Eu

B. La and Ce

C. Yb and Lu

D. Pr and Pm

Answer:



View Text Solution

39. Which one of the following is main cause of lanthanoid contraction?

A. Poor shielding effect of 5f sub shell

B. more shielding effect of 4f sub shell

C. Poor shielding effect of 4f sub shell

D. more shielding effect of 4f sub shell

Answer:



View Text Solution

40. Which of the following pair has more or less same atomic radius due to lanthanide contraction?

A. Ti and V

B. Fm and Md

C. No and Lr

D. Zr and Hf

Answer:



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41. Consider the following statement.

(i) All the actinoids are non radioactive.

(ii) Neptunium and other heavier elements are produced. by artificial transformation of nature rally occurring elements by nuclear reactions

(iii) Most of the actinoids have long half lives.

Which of the above statements is/ are not correct.

A. i only

B. i and ii

C. ii and iii

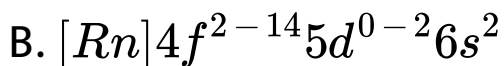
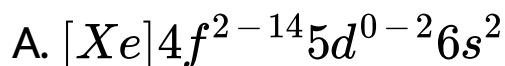
D. i and iii

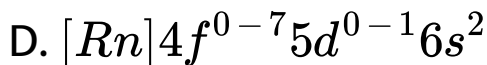
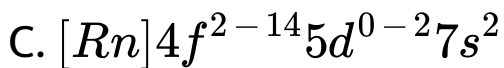
Answer:



View Text Solution

42. The general valence shell electronic configuration of actinoids is





Answer:



[View Text Solution](#)

43. Which pair of actinoids show +2 oxidation state?

A. Am and Th

B. Pa and U

C. Pu and Cm

D. No and Lr

Answer:



View Text Solution

44. Consider the following statement.

(i) Most of the actinoids are coloured.

(ii) Actinoids show greater tendency to form complexes.

(iii) Most of the actinoids are non-radioactive.

Which of the above statements is/ are correct.

A. i only

B. i and iii

C. i and ii

D. ii and iii

Answer:



View Text Solution

45. Consider the following statement.

(i) Lanthanoids do not form oxo cations.

(ii) Most of the lanthanoids are colourless.

(iii) Binding energy of 4f orbitals are lower

Which of the above statement is/ are not correct.

A. i and ii

B. iii only

C. i and iii

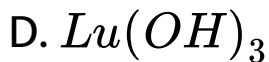
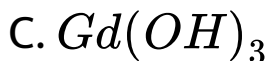
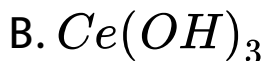
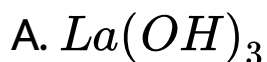
D. i, ii and iii

Answer:



View Text Solution

46. Which one of the following is more basic in nature?

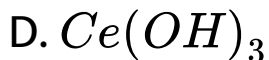
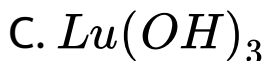
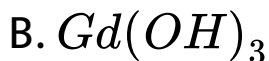
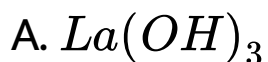


Answer:



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47. Which one of the following is less basic in nature?



Answer:



View Text Solution

Additional Questions II Fill In The Blanks

1. Transition elements occupy the central position of the periodic table between..... elements.



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2. Except elements, all transition metals are hard and have very high melting point



[View Text Solution](#)

3. metal is used in manufacture of artificial joints



[View Text Solution](#)

4. The extra stability of Cr and Cu is due to of electrons and exchange energy.



[View Text Solution](#)

5. The maximum melting point at about the middle of transition metal series indicates that configuration is favourable for strong attraction.



[View Text Solution](#)

6. The atomic radius of 5d elements and 4d elements are nearly same due to....



[View Text Solution](#)

7. Ni (II) compounds are thermodynamically..... than Pt (II) compounds.



[View Text Solution](#)

8. The first transition metal exhibits only +3 oxidation state



[View Text Solution](#)

9. The middle transition element has six different oxidation states.



[View Text Solution](#)

10. The substance which is oxidised is a..... agent and the one which is reduced is an agent.



[View Text Solution](#)

11. The oxidising and reducing power of an element is measured in terms of

 [View Text Solution](#)

12. If the E^0 of a metal is large and negative, the metal is a

 [View Text Solution](#)

13. The species with all paired electrons exhibit

.....



View Text Solution

14. The magnetic moment of an ion is given by

.....



View Text Solution

15. Many industrial processes use..... or their as catalyst.



View Text Solution

16. In the preparation of acetic acid from acetaldehyde the catalyst used in



View Text Solution

17. The catalyst used in the hydroformylation of olefins is

 [View Text Solution](#)

18. catalyst is used in polymerization of propylene.

 [View Text Solution](#)

19. Cr_2O_3 is..... and CrO is in nature



[View Text Solution](#)

20. Mn_2O_7 dissolves in water to give



[View Text Solution](#)

21. On heating potassium dichromate, it decomposes to give and molecular oxygen.



[View Text Solution](#)

22. Potassium dichromate is a powerful agent in acidic medium.



[View Text Solution](#)

23. is used in leather tanneries for chrome tanning.



[View Text Solution](#)

24. Potassium dichromate is used in quantitative analysis for the estimation of

And



[View Text Solution](#)

25. Permanganate ion has geometry in which Mn^{7+} is hybridised



[View Text Solution](#)

26. Cold dilute alkaline $KMnO_4$ is known as

.....



[View Text Solution](#)

27. is used for the treatment of skin infections and fungal infections of the foot.



[View Text Solution](#)

28. Baeyer's reagent is used for detecting
in an organic compounds.



[View Text Solution](#)

29. Due to the decrease in the size of Ln^{3+}
ions, the ionic character of Ln-OH bond
decreases which results in the



[View Text Solution](#)

30. All the actinoids are and most of them have half lives.



[View Text Solution](#)

31. do not form oxo cations.



[View Text Solution](#)

**Additional Questions iii Match The Following
Using The Code Given Below**

1. Match the following using the code given below

A. Tungsten	1. Development of human civilization			
B. Titanium	2. Light bulb filament			
C. Molybdenum	3. Artificial joint			
D. Copper	4. Boiler plants			
Code:	A	B	C	D
(a)	2	3	4	1
(b)	3	2	1	4
(c)	4	1	3	2
(d)	1	4	2	3



[View Text Solution](#)

2. Match the following using the code given below

A. Iron

B. Platinum

C. Cobalt

D. Titanium

1. Artificial joints

2. Hemoglobin

3. Catalysis

4. Vitamin-B₁₂

Code:	A	B	C	D
(a)	1	2	3	4
(b)	2	3	4	1
(c)	3	4	1	2
(d)	4	1	2	3



[View Text Solution](#)

3. Match the following using the code given below

A. Sc to Zn

B. Y to Cd

C. La to Hg

D. Ac to Lr

1. 5d series

2. Actinoids

3. 3d series

4. 4d series

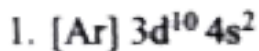
Code:	A	B	C	D
(a)	3	4	1	2
(b)	4	2	3	1
(c)	1	3	2	4
(d)	2	1	4	3



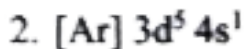
[View Text Solution](#)

4. Match the following using the code given below

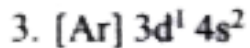
A. Cr



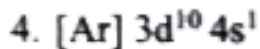
B. Cu



C. Zn



D. Sc



Code: A B C D

(a) 1 2 3 4

(b) 3 1 4 2

(c) 2 4 1 3

(d) 4 3 2 1



[View Text Solution](#)

5. Match the following using the code given below



Code:	A	B	C	D
(a)	1	2	3	4
(b)	2	1	4	3
(c)	3	4	2	1
(d)	4	3	1	2



[View Text Solution](#)

Additional Questions Iv Assertion And Reason

1. Assertion (A): Cr and Cu having $[Ar]3d^54s^1$ and $[Ar]3d^{10}4s^1$ are more stable.

Reason (R): The extra stability of elements Cr and Cu is due to symmetrical distribution of electrons and exchange energy.

- A. Both (A) and (R) are correct and (R) explains (A)
- B. Both (A) and (R) are correct but (R) is not the correct explanation of (A).
- C. (A) is correct but (R) is wrong

D. (A) is wrong but (R) is correct.

Answer:



[View Text Solution](#)

2. Assertion (A): In 3d transition elements, the expected decrease in atomic radius is observed from Sc to V, thereafter upto Cu, the atomic radius nearly remains the same.

Reason (R): As we move from Sc to V, the added 3d electrons only partially shield the

increased nuclear charge but upto Cu, the extra electron added to 3d sub-shell repel the 4s electrons and the slight increase in nuclear charge operated in opposite direction and it leads to constancy in atomic radii.

A. Both (A) and (R) are correct and (R) explains (A).

B. Both (A) and (R) are correct but (R) is not the correct explanation of (A).

C. (A) is correct but (R) is wrong.

D. (A) is wrong but (R) is correct.

Answer:



View Text Solution

3. Assertion (A): In transition metal series, the ionization enthalpy increases.

Reason (R): This is due to increase in nuclear charge corresponding to the filling of d electrons.

A. Both (A) and (R) are correct and (R) explains (A).

B. Both (A) and (R) are correct but (R) is not the correct explanation of (A),

C. A) is correct but (R) is wrong.

D. (A) is wrong but (R) is correct.

Answer:



View Text Solution

4. Assertion (A): Ni (II) compounds are thermodynamically more stable than Pt (II) compounds.

Reason (R): The energy required to form Ni^{2+} is less than that of Pt^{2+} .

A. Both (A) and (R) are correct and (R) explains (A).

B. Both (A) and (R) are correct but (R) is not the correct explanation of (A).

C. (A) is correct but (R) is wrong.

D. (A) is wrong but (R) is correct.

Answer:



View Text Solution

5. Assertion (A): Except Scandium all 3d series, transition elements exhibit variable oxidation states,

Reason (R): By losing electrons from (n-1)d orbital and ns orbital as the energy difference between them is very small

A. Both (A) and (R) are correct and (R) explains (A).

B. Both (A) and (R) are correct but (R) is not the correct explanation of (A).

C. (A) is correct but (R) is wrong.

D. (A) is wrong but (R) is correct.

Answer:



View Text Solution

6. Assertion (A): Mn^{2+} is more stable than Mn^{4+} .

Reason (R): $Mn^{2+} (3d^5)$ is more stable than

$Mn^{4+} (3d^3)$ is due to extra stability of half-filled electronic configuration.

A. Both (A) and (R) are correct and (R) explains (A).

B. Both (A) and (R) are correct but (R) is not the correct explanation of (A).

C. (A) is correct but (R) is wrong.

D. (A) is wrong but (R) is correct.

Answer:



View Text Solution

7. Assertion (A): Copper is unique in 3d series having a stable +1 oxidation state.

Reason (R): Copper is prone to disproportionate to the +2 and 0 oxidation states.

A. Both (A) and (R) are correct and (R) explains (A).

B. Both (A) and (R) are correct but (R) is not the correct explanation of (A).

C. (A) is correct but (R) is wrong.

D. (A) is wrong but (R) is correct.

Answer:



[View Text Solution](#)

8. Assertion (A): Transition metals form large number of complexes.

Reason (R): Transition metals are small and highly charged and they have vacant low

energy orbitals to accept an electron pair donated by other groups,

A. Both (A) and (R) are correct and (R) explains (A).

B. Both (A) and (R) are correct but (R) is not the correct explanation of (A).

C. (A) is correct but (R) is wrong.

D. (A) is wrong but (R) is correct.

Answer:



[View Text Solution](#)

Additional Questions V Find The Odd One Out

1. Find the odd one out.

A. Sc

B. Titanium

C. Yb and Lu

D. Cr

Answer: C



 [View Text Solution](#)

2. Find the odd one out.

A. Ru

B. Rh

C. Pd

D. Pt

Answer: D



[View Text Solution](#)

3. Find the odd one out.

A. Th

B. La and Ce

C. Ce

D. Lu

Answer: A



View Text Solution

4. Find the odd one out.

A. La

B. Pr

C. Am

D. Lu

Answer: C



View Text Solution

5. Find the odd one out.

A. Ce

B. Th

C. U

D. Pu

Answer: A



View Text Solution

6. Find the odd one out.

A. Ac

B. U

C. Pa

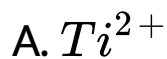
D. Np

Answer: A



View Text Solution

7. Find the odd one out.

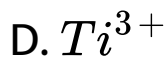
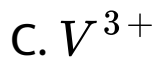


Answer: D



View Text Solution

8. Find the odd one out.



Answer: A



View Text Solution

9. Find the odd one out.

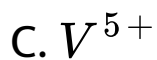
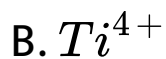


Answer: C



View Text Solution

10. Find the odd one out.

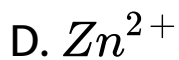


Answer: D



View Text Solution

11. Find the odd one out.



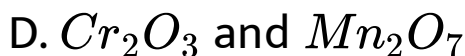
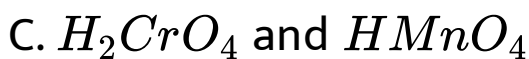
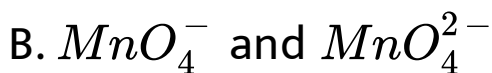
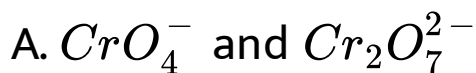
Answer: D



View Text Solution

Additional Questions Vi Find Out The Correct Pair

1. Find out the correct pair



Answer: A



View Text Solution

2. Find out the correct pair

A. Zn, Cu

B. Hf, Zr

C. Ag, Au

D. Ti, Cu

Answer: B



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3. Find out the correct pair

A. Ru, Os

B. Mn, Cu

C. Sc, Cu

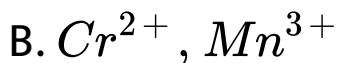
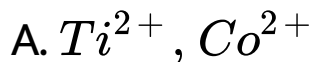
D. Ni, Co

Answer: A



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4. Find out the correct pair

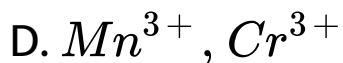
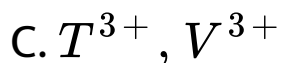
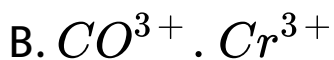
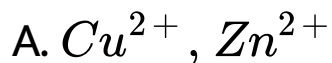


Answer: D



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5. Find out the correct pair



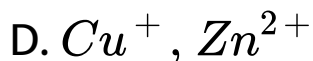
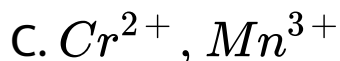
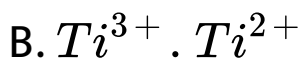
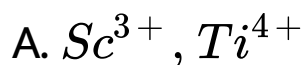
Answer: D



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Additional Questions Vii Find Out The Incorrect Pair

1. Find out the incorrect pair



Answer: B



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2. Find out the incorrect pair

A. Sc and Zn

B. Y and Cd

C. Ag and Au

D. Na and K

Answer: A



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Additional Questions Viii Two Mark Questions

1. d-block elements are called transition elements. Justify this statement.



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2. How many series are in d-block elements?
What are they?



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3. Zn, Cd, Hg belong to d-block elements even though they do not have partially filled d-orbitals. Give reason.



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4. Applying Aufbau principle, write down the electronic configuration of Sc ($Z = 21$) and Zn ($Z = 30$).



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5. Write a note about atomic radius of Zinc.

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6. Write a note about oxidation state of 3d series.

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7. Mn^{2+} is more stable than Mn^{4+} . Why?

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8. Ru and Os have highest oxidation state in which compounds? Explain with example.



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9. Copper is unique in 3d series. Prove this statement.



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10. Define - Standard electrode potential.



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11. Which metal is used to reduce Cr^{3+} ion?

Why?



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12. Sc^{3+} , Ti^{4+} , V^{5+} are diamagnetic. Give reason.



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13. Calculate the magnetic moment of Ti^{3+} and V^{4+} .



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14. Cr^{3+} , Mn^{4+} , V^{2+} are paramagnetic. Calculate their magnetic moment values.



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15. Mn^{2+} , Fe^{3+} have high magnetic moment.

Prove it.



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16. How many unpaired electrons are present in Co^{3+} , Fe^{2+} ? Calculate their magnetic moment.



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17. Calculate the magnetic moment and the number of unpaired electrons in Cu^{2+} .

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18. Cu^+ , Zn^{2+} are diamagnetic. Prove it.

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19. Most of the transition metals act as catalyst. Justify this statement.



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20. Explain the catalytic hydrogenation of alkene to alkane with equation.



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21. Which catalyst is used in the hydroformylation of olefins? Give equation.



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22. Which catalyst is used in the conversion of acetaldehyde to acetic acid? Give equation.



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23. What is Zeigler -Natta catalyst? In which reaction it is used? Give equation.



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24. d-block elements readily form complexes.

Give reason.



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25. Prove that acidified potassium dichromate is a powerful oxidising agent.



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26. What are the uses of potassium dichromate?



View Text Solution

27. Draw and explain about the structure of permanganate ion.



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28. Explain the action of heat on potassium permanganate.



View Text Solution

29. Prove that Potassium permanganate is an oxidising agent in neutral medium.



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30. What happens when thiosulphate ion is treated with permanganate ion?



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31. What is Baeyer's reagent? Where it is used?



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32. Acidified $KMnO_4$ is a very strong oxidising agent. Prove it.



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33. $KMnO_4$ does not act as oxidising agent in the presence of HCl. Why?



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34. HNO_3 cannot be used as an acid medium along with $KMnO_4$ Why?



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35. Among HCl , HNO_3 and H_2SO_4 which is the suitable medium for KMnO_4 in oxidising reaction?



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36. Explain about the causes of lanthanide contraction.



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Additional Questions | 3 Mark Questions

1. Cr and Cu are more stable. Give reason.



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2. Explain about the metallic behaviour of d-block elements.



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3. Explain about the variation of melting point among the transition metal series.



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4. Explain about the variation of atomic radius along a period of 3d series.



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5. Ni (II) compounds are more stable than Pt (II) compounds. Give reason.



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6. Compare the reduction potentials of Mn^{3+} / Mn^{2+} and Fe^{3+} / Fe^{2+} .



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7. How alloys are formed in d-block elements?



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8. What are interstitial compounds? Give their properties.





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9. Explain the action of heat on potassium dichromate.



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10. Draw and explain about the structure of chromate and dichromate ion.



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11. Explain the action of acidified $K_2C_2O_7$ with

(i) Iodide (ii) Sulphide



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12. Explain the action of acidified $K_2C_2O_7$ with

(i) Sulphur dioxide (ii) Alcohols.



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13. Explain about chromyl chloride test.



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14. Explain the action of Conc. H_2SO_4 on potassium permanganate.



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15. What are the uses of Potassium permanganate?



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16. Calculate the equivalent weight of $KMnO_4$ in (i) Acidic medium (ii) Basic medium (iii) Neutral medium



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17. Explain about the oxidation state of actinoids.



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18. Write the electronic configuration of (i) AC (Z = 89) (ii) Am (Z = 95) (iii) Lr (Z = 103)



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Additional Questions X 5 Mark Questions

1. Explain about the magnetic properties of transition elements,



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2. How will you prepare potassium permanganate from pyrolusite ore?

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3. Explain acidified KMnO_4 is a powerful oxidising agent with 5 examples.

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4. Explain about the oxidation state of Lanthanoids.



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