Question

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

[AIPMT-2006]

1. more active nature of the actinoids

5f, 6d, 7s

2. more energy difference between 4f and 5d orbitals

(Energy gap similar)

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

4. greater metallic character of the lanthanoids than that of the corresponding actinoids

Question

Identify the incorrect statement among the following

[AIPMT-2007]

1. Lanthanoid contraction is the accumulation of successive shrinkages.

2. As a result of lanthanoid contraction, the properties of 4d series of the transition elements have no similarities with the 5d series of elements.

3. Shielding power of 4f electrons is quite weak.

4. there is a decrease in the radii of the atoms or ions as one proceeds from La to Lu.

Question

Which of the following oxidation states is the most common among the lanthanoids :-

[AIPMT-2010]

1. 2
2. 5
3. 3
4. 4

Question

Which of the statements is not true?

[AIPMT Pre.-2012]

1. $K_2Cr_2O_7$ solution in acidic medium is orange

2. $K_2Cr_2O_7$ solution becomes yellow on increasing the pH beyond 7

3. On passing H_2S through acidified $K_2Cr_2O_7$ solution, a milky colour is observed

4. $Na_2Cr_2O_7$ is preferred over $K_2Cr_2O_7$ in volumetric analysis

Question

Which one of the following statements related to lanthanons is incorrect?

[NEET-II 2016]

1. All the lanthanons are much more reactive than aluminium

2. Ce(+4) solutions are widely used as oxidizing agent in volumetric analysis ✓

3. Europium shows +2 oxidation state ✓ (f^7)

4. The basicity decrease as the ionic radius decreases from Pr to Lu ✓

$La(OH)_3$ ——— $Lu(OH)_3$

Size ↓ EN ↑ Acidic ↑ Basic ↓

Question

Generally transition elements form coloured salts due to the presence of unpaired electrons. Which of the following compounds will be coloured in solid state ?

1. Ag_2SO_4 (+1, d^{10})
2. CuF_2 (+2, d^9)
3. ZnF_2 (+2, d^{10})
4. Cu_2Cl_2 (+1, d^{10})

Question

On addition of small amount of $KMnO_4$ to concentrated H_2SO_4, a green oily compound is obtained which is highly explosive in nature. Identify the compound from the following :

1. Mn_2O_7
2. MnO_2
3. $MnSO_4$
4. Mn_2O_3

Question

When $KMnO_4$ solution is added to oxalic acid solution, the decolourisation is slow in the beginning but becomes instantaneous after some time because.

1. CO_2 is formed as the product
2. Reaction is exothermic
3. MnO_4^- catalyses the reaction
4. Mn^{2+} acts as autocatalyst

Question

Which of the following are amphoteric oxides?

Mn_2O_7, CrO_3, Cr_2O_3, CrO, V_2O_5, V_2O_4

1. V_2O_5, Cr_2O_3
2. Mn_2O_7, CrO_3
3. CrO, V_2O_5
4. V_2O_5, V_2O_5

Question

Which of the following actinoids show oxidation states upto + 7 ?

(a) Am
(b) Pu
(c) U
(d) Np

1. a, b
2. b, c
3. c, d
4. b, d

Question

Which of the following will not act as oxidising agents ?

(a) CrO_3 (+6)

(b) WO_3

(c) MoO_3

(d) CrO_4^{2-} (+6)

1. a, b
2. c, d
3. b, c
4. a, d

Question

Which of the following lanthanolds show +2 oxidation state besides the charcteristics oxidastion state +3 of lanthanoids ?

(a) Ce Ce^{+4}

(b) Eu

(c) Yb

(d) Ho

1 a, b

2 b, c

3 c, d

4 a, d

Question

Which of the following oxide of chromium is amphoteric in nature?

1. CrO
2. Cr_2O_3
3. CrO_3
4. CrO_5

H.W

Question

Why is HCl not used to make the medium acidic in oxidation reactions of $KMnO_4$ in acidic medium?

Cl_2 — HCl, HBr, HI ✗

1. Both HCl and $KMnO_4$ act as oxidising agents

HNO_3 ✗

2. $KMnO_4$ oxidises HCl into Cl_2 which is also an oxidising agent

conc. H_2SO_4 ✗

dil H_2SO_4 ✓

3. $KMnO_4$ is a weaker oxidising agent than HCl

4. $KMnO_4$ acts as a reducing agent in the presence of HCl.

Question

Which pair of ions is colourless :

1. Mn^{+3}, Co^{+3}
2. Fe^{3+}, Cr^{+3}
3. Zn^{2+}, Sc^{3+}
4. Ti^{2+}, Cu^{2+}

H.W

Question

$Cr_2O_7^{2-} \underset{Y}{\overset{X}{\rightleftharpoons}} 2CrO_4^{2-}$, X and Y are respectively

Orange Yellow

1. $X = OH^-, Y = H^+$
2. $X = X^+, Y = OH^-$
3. $X = OH^-, Y = H_2O_2$
4. $X = H_2O_2, Y = OH^-$

Question

Select reducing agent from Eu^{+2}, Yb^{+2}, Ce^{+4}, Mn^{+2}, Cr^{+2}, Mn^{+3} :

1. Mn^{2+}, Cr^{2+}, Eu^{2+}
2. Eu^{+2}, Yb^{2+}, Cr^{2+}
3. Cr^{3+}, Eu^{2+}, Yb^{2+}
4. Cu^{+4}, Yb^{2+}, Mn^{3+}

Question

Which of the following statement is not correct?

1. MnO_4^{-2} is stable only in very strong alkali

2. d-block metals can show zero oxidation state with π-acid ligands like CO.

3. $KMnO_4$ does not act as oxidising agent in alkaline medium

4. The purest form of iron is wrought iron

Question

Highest oxidation state of Mn is exhibited in Mn_2O_7. The correct statements about Mn_2O_7 are

(A) Mn is tetrahedrally surrounded by oxygen atoms.

(B) Mn is octahedrally surrounded by oxygen atoms.

(C) Contains Mn-O-Mn bridge.

(D) Contains Mn-Mn bond.

Choose the correct answer from the options given below:

1. A and Conly
2. B and D only
3. A and D only
4. B and C only

Question

Which one amongst the following are good oxidizing agents?

A. Sm^{2+}

B. Ce^{2+}

C. Ce^{4+}

D. Tb^{4+}

O.A

Choose the most appropriate answer from the options given below:

1. A and B only
2. C and D only
3. D only
4. C only

Question

How many of the following metal ions have similar value of spin only magnetic moment in gaseous state? _____

(Given: Atomic number : V, 23; Cr, 24; Fe, 26; Ni, 28

$V^{3+}, Cr^{3+}, Fe^{2+}, Ni^{3+}$

H.W

Question

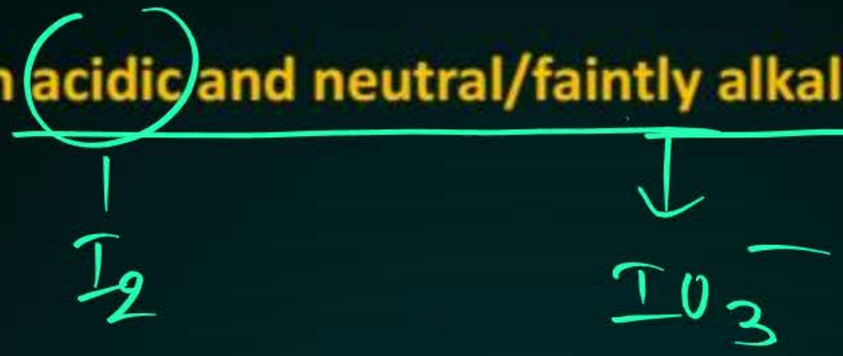
Potassium dichromate acts as a strong oxidizing agent in acidic solution. During this process, the oxidation state changes from

$Cr_2O_7^{2-} \longrightarrow Cr^{3+}$

1. +6 to +3
2. +2 to +1
3. +6 to +2
4. +3 to +1

Question

$KMnO_4$ oxidises I^- in acidic and neutral/faintly alkaline solution, respectively, to



1. I_2 & IO_3^-
2. I_2 & I_1
3. IO_3^- & I_2
4. IO_3^- & IO_3^-

Question

Which of the following elements have half-filled f-orbitals in their ground state?
(Given: atomic number Sm $= 62$; Eu $= 63$; Tb $= 65$; Gd $= 64$, Pm $= 61$)

A. Sm B. Eu

C. Tb D. Gd E. Pm

Choose the correct answer from the options given below:

1. C and D only
2. A and E only
3. B and D only
4. A and B only

Thank You