2316 250

Class – B.Sc -IV Sem
Subject – Chemistry
Paper – Inorganic

Time Allowed : 3 Hours Maximum Marks : 35

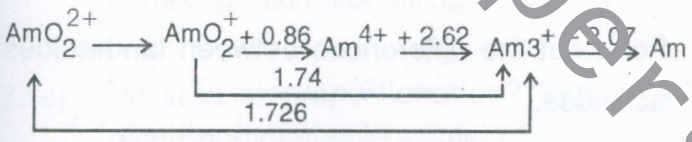
SECTION-A

Attempt all questions. Each question carries 1 mark.

1. The complex $[Co(NH_3)_5 CO_3]Cl$ has two ionization isomers. Write their structural formulae & also define conization isomerism.

2. Oxalic acid is commonly used to remove rust stains. Justify.

3. The Latimer diagram for Americium is



Predict the species which can disproportionate and into which species.

4. Will it be possible to oxidize Cl^- & Co^{2+} with acidic $Cr_2O_7^{2-}$

$E^oCl_2/Cl^- = +1.3595V$, $E^oCo^{3+}/Co^{2+} = +1.81V$ & $E^o_{(Cr_2O_7^{2-}/2Cr^{3+})} = +1.33\,V$

5. Which of the following obeys EAN rule :

(a) $[Cr(Co)_6]$ (ii) $[Ni(NH_3)_6]^{2+}$

6. Can pyrazinium ion act as ligand? Explain.

7. What is the oxidation state of UO_2^{2+} in & UO_2^{+}?

8. Work out the number of unpaired e's in La^{+3} & Ce^{+4} ions. (1 × 8)

SECTION-B

Attempt two questions from each part.

PART-I

9. (a) Chemistry of all lanthanides is identical. Explain.

   (b) What are transuranic elements? List them in order. 2½, 2

10. Compare the following properties of lanthanides with those of transition elements.

    (a) Magnetic Properties (b) Coloured spectra 4½

11. Point out the differences between lanthanides and actinides. 4½

PART-II

12. What is chelate effect? Discuss factors affecting it. 4½

13. (a) Write IUPAC name of (i) $[C_6H_5)_3P]$ RhCl,
    (ii) $[Pt(py)_4][PtCl_4]$.

    (b) Write name and all possible isomers of dichlorobis (ethylene diamine) cobalt (III) ion. 2, 2½

14. (a) Why $[Ni(CN)_4]^{-2}$ is diamagnetic & square planar

while $[NiCl_4]^{-2}$ is paramagnetic and tetrahedral?

(b) Sketch structure of

(i) trans $[Co(NH_3)_4 Cl_2]$

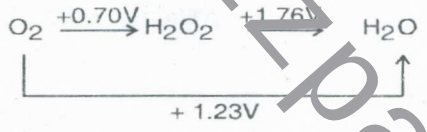
(ii) $[Pt(gly)_2]$

(iii) $[RhCl_3(py)_3]$ 1½, 3

PART-III

15. Discuss Pourbaix diagram for any system. What information does it give? 4½

16. (a) Construct a Frost diagram for oxygen from Latimer diagram



(b) Explain the term disproportionation and comproportionation using Frost diagram. 1½, 3

17. (a) What is disproportionation? Explain why Cu^+ disproportionates in solution.

(b) Discuss redox stability of metal ion in water. 3, 1½

******