

Unit 4 - Week 2

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

● Lecture 5 : Ellingham Diagram

● Lecture 6 : Thermit Process and Zone Refining

● Lecture 7 : Coordination Chemistry: 18 electron rule and VBT

○ Lecture 8 : Crystal Field Theory: Octahedral Complex

○ Lecture 9 : Crystal Field Theory: Tetrahedral Complex

○ Quiz : Week 2 : Assignment 2

○ Download Videos

○ Weekly Feedback

Week 3

Week 4

Text Transcripts

Week 2 : Assignment 2

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-02-12, 23:59 IST.

1) The total number of geometrical and optical isomers for the complex ion $[\text{Co}(\text{en})_2\text{Cl}_2]^+$ is

1 point

- 3
 2
 4
 6

No, the answer is incorrect.
Score: 0

Accepted Answers:
3

2) In which of the following Ni is in the highest oxidation state?

1 point

- $\text{K}_4[\text{Ni}(\text{CN})_6]$
 $\text{K}_2[\text{NiF}_6]$
 $[\text{Ni}(\text{CO})_4]$
 $[\text{Ni}(\text{CN})_4]^{2-}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\text{K}_2[\text{NiF}_6]$

3) What is the relation between tetrahedral splitting energy (Δ_t) and octahedral splitting energy (Δ_o).

1 point

- $\Delta_t = 0.33 \Delta_o$
 $\Delta_o = 0.33 \Delta_t$
 $\Delta_t = 0.44 \Delta_o$
 $\Delta_o = 0.44 \Delta_t$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\Delta_t = 0.44 \Delta_o$

4) The correct order for the wavelength of absorption in the visible region is

1 point

- $[\text{Ni}(\text{NO}_2)_6]^{4-} < [\text{Ni}(\text{NH}_3)_6]^{2+} < [\text{Ni}(\text{H}_2\text{O})_6]^{2+}$
 $[\text{Ni}(\text{NO}_2)_6]^{4-} < [\text{Ni}(\text{H}_2\text{O})_6]^{2+} < [\text{Ni}(\text{NH}_3)_6]^{2+}$
 $[\text{Ni}(\text{H}_2\text{O})_6]^{2+} < [\text{Ni}(\text{NH}_3)_6]^{2+} < [\text{Ni}(\text{NO}_2)_6]^{4-}$
 $[\text{Ni}(\text{NH}_3)_6]^{2+} < [\text{Ni}(\text{H}_2\text{O})_6]^{2+} < [\text{Ni}(\text{NO}_2)_6]^{4-}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $[\text{Ni}(\text{NO}_2)_6]^{4-} < [\text{Ni}(\text{NH}_3)_6]^{2+} < [\text{Ni}(\text{H}_2\text{O})_6]^{2+}$

5) Among the following which one is paramagnetic?

1 point

- $[\text{Co}(\text{NH}_3)_6]^{+3}$
 $[\text{NiCl}_4]^{2-}$
 $[\text{Fe}(\text{CN})_6]^{4-}$
 $\text{K}_2[\text{NiF}_6]$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $[\text{NiCl}_4]^{2-}$

6) Consider the 18 electron rule as a guide and determine the value of n in the following complex.
 $\text{Rh}(\text{h}^5\text{-C}_5\text{H}_5)(\text{CO})_n$

1 point

- 5
 2
 4
 3

No, the answer is incorrect.
Score: 0

Accepted Answers:
2

7) What will be the electronic configuration for the complex $\text{K}_3[\text{Fe}(\text{oxalate})_3] \cdot 3\text{H}_2\text{O}$?

1 point

- $t_{2g}^4 e_g^1$
 $t_{2g}^3 e_g^2$
 $t_{2g}^2 e_g^3$
 $t_{2g}^5 e_g^0$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $t_{2g}^3 e_g^2$

8) The electronic configuration of $[\text{CoF}_6]^{3-}$ and $[\text{Co}(\text{NH}_3)_6]^{3+}$ are respectively

1 point

- $t_{2g}^5 e_g^2, t_{2g}^6 e_g^1$
 $t_{2g}^6 e_g^1, t_{2g}^5 e_g^2$
 $t_{2g}^4 e_g^2, t_{2g}^6$
 $t_{2g}^6, t_{2g}^4 e_g^2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $t_{2g}^4 e_g^2, t_{2g}^6$

9) Which one of the following octahedral complexes does not show geometrical isomerism? (A and B are monodentate ligands)

1 point

- $[\text{MA}_2\text{B}_4]$
 $[\text{MA}_3\text{B}_3]$
 $[\text{MA}_4\text{B}_2]$
 $[\text{MA}_5\text{B}]$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $[\text{MA}_5\text{B}]$

10) What is the limitation of Ellingham diagram?

1 point

- Gives idea about thermal stability of compound.
 The main application of Ellingham diagrams is in the extractive metallurgy industry.
 Does not consider kinetics of the reactions
 The diagrams are useful in predicting the conditions under which an ore will be reduced to its metal.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Does not consider kinetics of the reactions