

Assignment NPTEL  
30-01-2022



Match column A with column B.

Column A (Composition)	Column B (Complex)
(I) $\text{CoCl}_3 \cdot 5\text{NH}_3$	(P) $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+ (\text{Cl}^-)$
(II) $\text{CoCl}_3 \cdot 4\text{NH}_3$	(Q) $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]$
(III) $\text{CoCl}_3 \cdot 3\text{NH}_3$	(R) $[\text{Co}(\text{NH}_3)_5\text{Cl}]^{2+} (\text{Cl}^-)_2$

- a) I-R; II- P; III-Q
- b) I-P; II- Q; III-R
- c) I-Q; II-P; III-R
- d) I-R, II- Q; III-P

Ans. a)



What happens when  $\text{Ag}^+$  reacts with the complex  $[\text{Co}(\text{NH}_3)_3(\text{Cl})_3]$ ?

- a) One mole of  $\text{AgCl}$  will precipitate
- b) No  $\text{AgCl}$  will precipitate
- c) Three moles of  $\text{AgCl}$  will precipitate
- d) Two moles of  $\text{AgCl}$  will precipitate

Ans. b)



Fill in the blank with the suitable option given below.

When  $\text{CoCl}_2$  is dissolved in  $\text{H}_2\text{O}$  and  $\text{NH}_3$  is added to the reaction, then the geometry of the produced complex will be \_\_\_\_\_.

- a) Tetrahedral
- b) Trigonal planar
- c) Linear
- d) Octahedral

Ans. d)



**NPTEL**

Which statement is INCORRECT for transition metal?

- a) These have variable oxidation states.
- b) They formed colored complexes when they are dissolved in the water molecule.
- c) They are not able to form metal complexes.
- d) Electrons from both d and s subshells can be involved in compound formation.

Ans. c)



**NPTEL**

Match column A and column B.

	<b>Ligand (Column A)</b>	<b>Donor atoms (Column B)</b>
I.	Ethylenediamine	A. O, O donor atoms
II.	Glycine	B. N, N donor atoms
III.	Catechol	C. N, N, N donor atoms
IV.	Terpyridine	D. N, O donor atoms

- a) I.-B; II.-D; III.-A; IV.-C
- b) I.-A; II.-B; III.-C; IV.-D
- c) I.-B; II.-C; III.-D; IV.-A
- d) I.-C; II.-A; III.-B; IV.-D

Ans. a)



**NPTEL**

What is the oxidation state of Fe in the complex of  $K_3[Fe(CN)_6]$  complex?

- a) +6
- b) +4
- c) -2
- d) +3

<b>Sc</b>				<b>+3</b>			
<b>Ti</b>	+1	+2	+3	+4			
<b>V</b>	+1	+2	+3	+4	+5		
<b>Cr</b>	+1	+2	+3	+4	+5	+6	
<b>Mn</b>	+1	+2	+3	+4	+5	+6	+7
<b>Fe</b>	+1	+2	+3	+4	+5	+6	
<b>Co</b>	+1	+2	+3	+4	+5		
<b>Ni</b>	+1	+2	+3	+4			
<b>Cu</b>	+1	+2	+3				
<b>Zn</b>			<b>+2</b>				

Ans. d)



**NPTEL**

Which one contains heme group?

- a) Myoglobin
- b) Cytochrome
- c) Catalase
- d) All of these

Ans. d)



**NPTEL**



Fill in the blank with the suitable option given below.

The color of the ferric ion from very light yellow to red blood color can detect \_\_\_\_\_ anion.

- a)  $\text{N}_3^-$
- b)  $\text{SCN}^-$
- c)  $\text{COO}^-$
- d)  $\text{Cl}^-$

Ans. b)



**NPTEL**

Which complex is formed in the brown ring test for detection of nitrate?

- a)  $[\text{Fe}(\text{H}_2\text{O})_5\text{NO}]^{2+}$
- b)  $[\text{Fe}(\text{H}_2\text{O})_6\text{NO}]$
- c)  $[\text{Fe}(\text{H}_2\text{O})_4(\text{NO})_2]^{2+}$
- d)  $[\text{Fe}(\text{H}_2\text{O})_3(\text{NO})_3]^+$

Ans. a)



The coordination number of the metal ions in complexes  $[\text{Ag}(\text{H}_2\text{O})_2]\text{Cl}$ ,  $[\text{Fe}(\text{H}_2\text{O})_6]\text{Cl}_2$ ,  $\text{K}_4[\text{Fe}(\text{CN})_6]$  and  $[\text{Ni}(\text{NH}_3)_4]\text{Cl}_2$  are respectively

- a. 3, 6, 6 and 6
- b. 2, 6, 6 and 4
- c. 2, 6, 6 and 6
- d. 3, 8, 10 and 6

