Set – 1

Table 9.1: Formulation of Cobalt(III) Chloride-Ammonia Complexes

Colour	Formula	Solution conductivity corresponds to
Yellow	$[Co(NH_3)_6]^{3+}3Cl^-$	1:3 electrolyte
Purple	$[CoCl(NH_3)_5]^{2+}2Cl^-$	1:2 electrolyte
Green	$[CoCl_2(NH_3)_4]^+Cl^-$	1:1 electrolyte
Violet	$[CoCl_2(NH_3)_4]^+Cl^-$	1:1 electrolyte

Q1. Which of the following compounds shows yellow colour?

A. $[Co(NH_3)_6]^{3+}3Cl^-$
B. $[CoCl(NH_3)_5]^{2+}2Cl^-$
C. $[CoCl_2(NH_3)_4]^+Cl^-$
D $[CoCl_3(NH_3)_3]$

Ans. (A)

Q2. The electrolyte ratio of solution conductivity of [CoCl(NH3)5]2+2Cl–is:

A. 1:3
B. 1:2
C. 1:1
D. 3:1

Ans. (B)

Q3. Which of the following represents purple colour?

A. $[CoCl_3(NH_3)_3]$
B. $[CoCl_2(NH_3)_4]^+Cl^-$
C. $[CoCl(NH_3)_5]^{2+}2Cl^-$
D. $[Co(NH_3)_6]^{3+}3Cl^-$

Ans. (C)

Q4. Which of the following represents green colour?

A. $[CoCl_2(NH_3)_4]^+Cl^-$
B. $[CoCl(NH_3)_5]^{2+}2Cl^-$
C. $[Co(NH_3)_6]^{3+}3Cl^-$
D. $[CoCl_3(NH_3)_3]$

Ans. (A)

Q5. The electrolyte ratio of solution conductivity of [CoCl2(NH3)4]+Cl–is:

A. 1:1
B. 2:1
C. 3:1
D. 1:2

Ans. (A)

Set – 2

Table 9.3: Relationship between the Wavelength of Light absorbed and the Colour observed in some Coordination Entities

Coordinaton entity	Wavelength of light absorbed (nm)	Colour of light absorbed	Colour of coordination entity
$[CoCl(NH_3)_5]^{2+}$	535	Yellow	Violet
$[Co(NH_3)_5(H_2O)]^{3+}$	500	Blue Green	Red
$[Co(NH_3)_6]^{3+}$	475	Blue	Yellow Orange
$[Co(CN)_6]^{3-}$	310	Ultraviolet	Pale Yellow
$[Cu(H_2O)_4]^{2+}$	600	Red	Blue
$[Ti(H_2O)_6]^{3+}$	498	Blue Green	Violet

Not in visible region

Q1. Which of the following coordination entity absorbs the maximum wavelength of light?

A. $[Co(CN)_6]^{3â€“}$
B. $[Cu(H_2O)_4]_{2+}$
C. $[Ti(H_2O)_6]^{3+}$
D. $[Co(NH_3)_5(H_2O)]^{3+}$

Ans. (B)

Q2. Which of the following represents the true colour of $[Cu(H_2O)_4]^{2+}$ coordination compound?

A Red
B. Blue green
C. Yellow
D. Blue

Ans. (D)

Q3. Colour absorbed by $[Ti(H_2O)_6]^{3+}$ coordination entity is:

A. Blue green
B. Yellow
C. Red
D. blue

Ans. (A)

Q4. Which of the following is the actual colour of ruby?

A. Blue
B. Green
C. Yellow
D. red

Ans. (D)

Q5. Red colour of ruby is caused by the presence of:

A. Al^{3+} in CrO_2
B. Cr^{3+} in AlO_2
C. Fe^{3+} in AlO_2
D. Fe^{3+} in CrO_2

Ans. (B)

Q6. Which of the following is the true colour of emerald?

A. Green
B. Blue

C. Pink
D. white

Ans. (A)