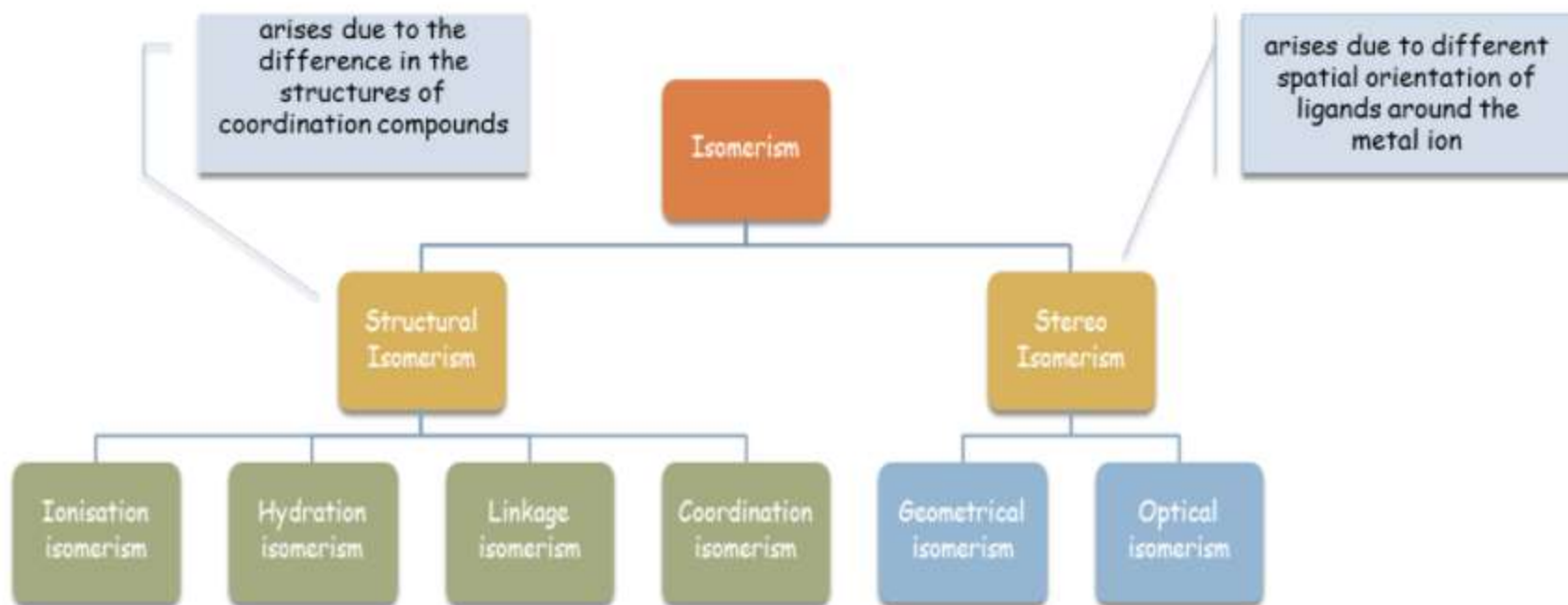


Assignment NPTEL
13-02-2022







What do you mean by enantiomers?

- a) Isomers that are formed by exchanging ligands and metal ion
- b) Isomers is occurred by different donor atoms bound to metal ion
- c) Constitutional isomers by different arrangement around metal ion
- d) Isomers with non-superimposable mirror images

- a
- b
- c
- d

Ans. d



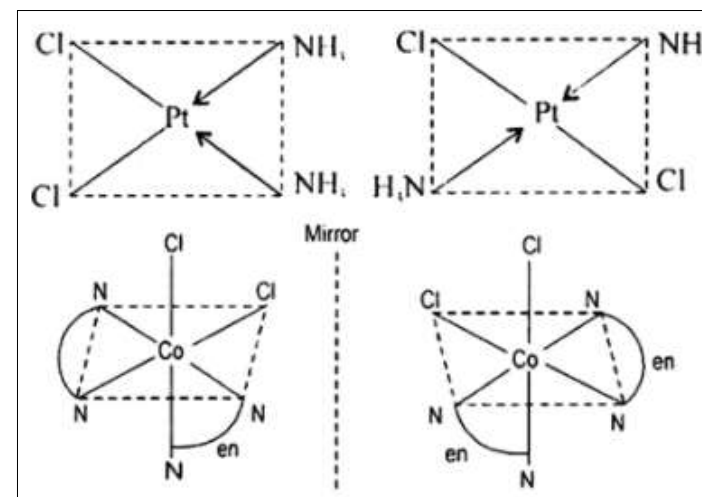
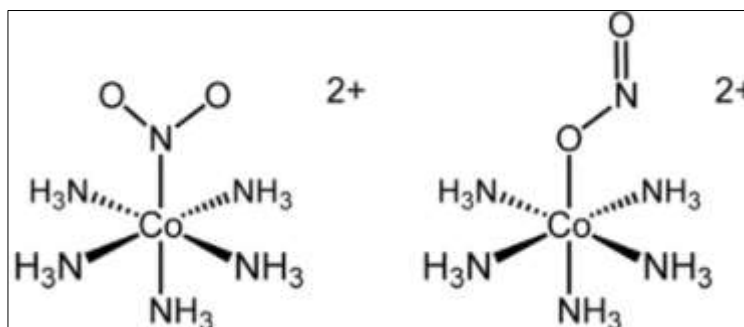
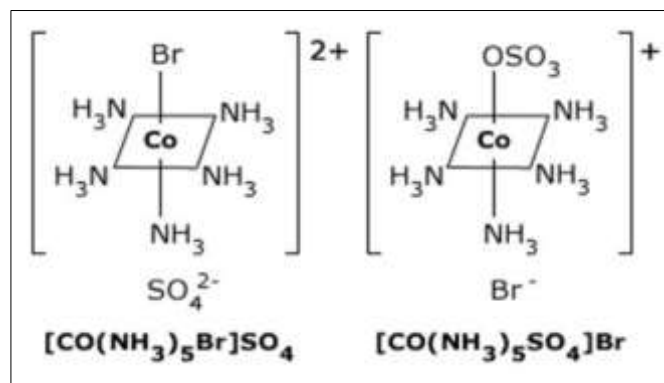


What type of isomerism is present in $[\text{Cr}(\text{NH}_3)_5\text{SO}_4]\text{Br}$ and $[\text{Cr}(\text{NH}_3)_5\text{Br}]\text{SO}_4$?

- a) Coordination isomerism
- b) Linkage isomerism
- c) Geometrical isomerism
- d) Optical isomerism

- a
- b
- c
- d

Ans. a





How many numbers of isomers are possible in the MA_2B_2 square planar type of complexes?

- a) 4
- b) 6
- c) 2
- d) 1

- a
- b
- c
- d

Ans. c

Octahedral

Ma_4b_2	-	Cis , Trans - 2
Ma_3b_3	-	Fac , Mer - 2
$M(AA)b_2$	-	Cis , Trans - 2
$Mabcdef$	-	15
$M(AB)_3$	-	Cis , Trans - 2
$Ma_2b_2c_2$	-	5

Square planar

Ma_2b_2	-	Cis , Trans - 2
Ma_2bc	-	Cis , Trans - 2
$Mabcd$	-	3
$M(AB)_2$	-	Cis , Trans - 2
$[Ma_2b_4]_2$	-	Cis , Trans - 2

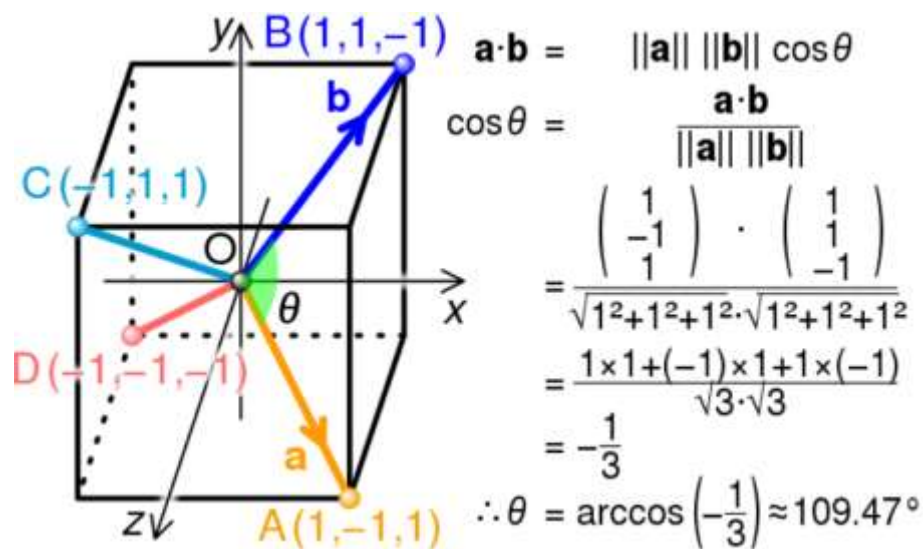


Which type of complexes cannot exhibit geometrical isomers?

- a) Octahedral complex
- b) Tetrahedral complex
- c) Square planar complex
- d) All of these

- a
- b
- c
- d

Ans. b



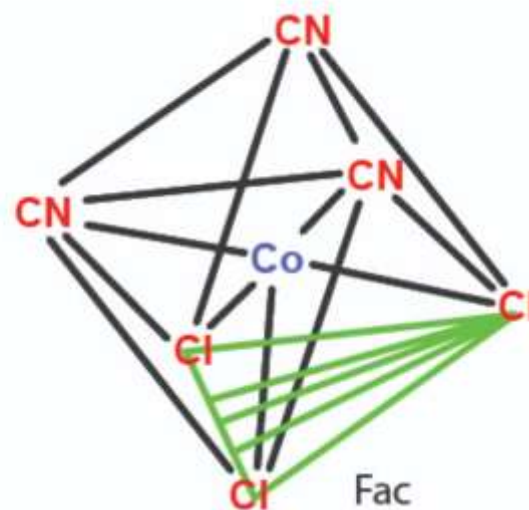
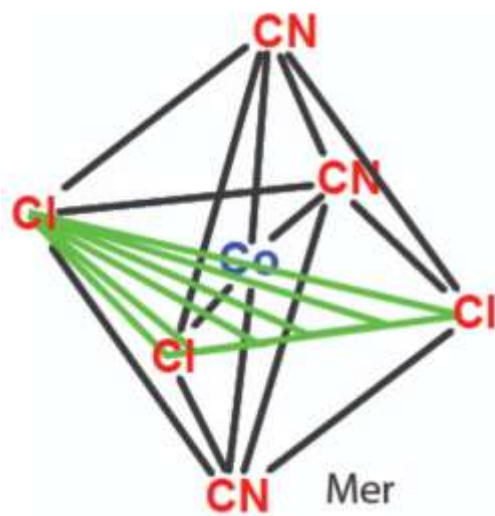


For MX_3Y_3 type of octahedral complexes, the two spatial arrangements are _____ .

- a) Cis- trans
- b) Delta- lambda
- c) Fac- mer
- d) None of these

- a
- b
- c
- d

Ans. c



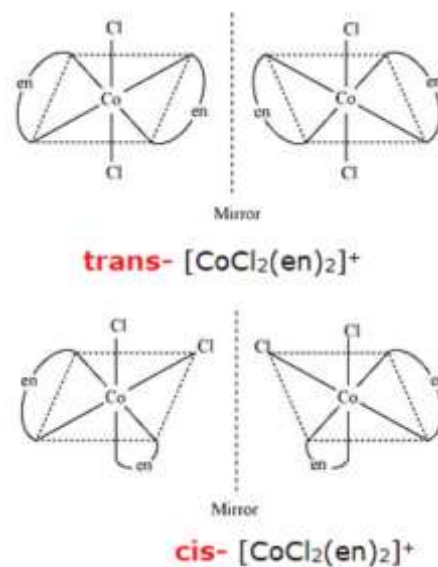


What are the colour of two isomers of $[\text{CoCl}_2(\text{en})_2]^+$ complex?

- a) Cis- violet, Trans- green
- b) Cis- green, Trans- violet
- c) Both are violet
- d) Both are green

- a
- b
- c
- d

Ans. a



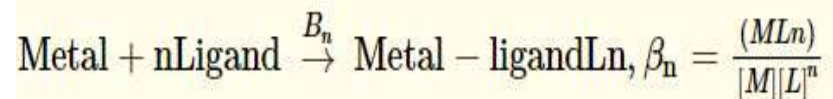


Which one is the INCORRECT statement for the cumulative constants?

- a) It is the constant for the formation of a complex from reagents
- b) It is denoted by the symbol of β
- c) It is the product of stepwise constants
- d) It is denoted by K_w

- a
- b
- c
- d

Ans. d



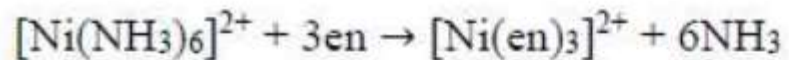
$$\begin{aligned} \beta_3 &= \frac{[ML_3]}{[M][L]^3} \times \frac{[ML][ML_2]}{[ML][ML_2]} \\ &= \frac{[ML_1]}{[M][L]} \times \frac{[ML_2]}{[ML][L]} \times \frac{[ML_3]}{[ML_2][L]} = K_1 \times K_2 \times K_3 \end{aligned}$$

$$\beta_n = \sum_{n=1}^{n=n} K_n$$

$$\text{Thus } \beta_n = \frac{[ML_1]}{[M][L]} \times \frac{[ML_2]}{[ML][L]} \cdots \frac{[ML_n]}{[ML_{n-1}][L]} = K_1 \times K_2 \cdots K_n$$



What will be the formation constant for the given reaction?



a) $K_f = \frac{[\text{Ni}(\text{en})_3] [\text{NH}_3]^6}{[\text{Ni}(\text{NH}_3)_6] [\text{en}]^3}$

b) $K_f = \frac{[\text{Ni}(\text{en})_3]}{[\text{Ni}(\text{NH}_3)_6] [\text{en}]}$

c) $K_f = \frac{[\text{Ni}(\text{en})_3] [\text{NH}_3]^2}{[\text{Ni}(\text{NH}_3)_6]}$

d) $K_f = \frac{[\text{Ni}(\text{en})_3] [\text{en}]}{[\text{Ni}(\text{NH}_3)_6] [\text{NH}_3]}$

Ans. a

- a
- b
- c
- d



Which one of the given complexes is optically inactive?

- a) Cis- $[\text{Co}(\text{NH}_3)_4(\text{Cl})_2]$
- b) Trans- $[\text{Co}(\text{NH}_3)_4(\text{Cl})_2]$
- c) $[\text{Co}(\text{NH}_3)_5\text{Cl}]$
- d) $[\text{Co}(\text{H}_2\text{O})_3\text{Br}_3]^{3+}$

- a
- b
- c
- d

Ans. c