Previous Year JEE Problems with Solutions

Problem 2: JEE Main 2021 (Online) 27th July Morning Shift

The number of geometrical isomers possible in triamminetrinitrocobalt (III) is X and in trioxalatochromate (III) is Y. Then the value of X + Y is ______.

Solution: The correct answer is 2.

Triamminetrinitrocobalt (III) \rightarrow [Co(NO₂)₃(NH₃)₃]

trioxalatochromate (III) ion \rightarrow [Cr(C₂O₄)₃]³⁻[Co(NO₂)₃(NH₃)₃]

$$\begin{array}{c|c} H_3N & NO_2 \\ \downarrow & +3 \\ NO_2 \\ H_3N & NO_2 \end{array} & \begin{array}{c} H_3N & NO_2 \\ \downarrow & +3 \\ NO_2 \\ NO_2 \end{array} & NH_3 \\ NO_2 & NO_2 \end{array}$$

$$\begin{array}{c} Two \ geometrical \\ isomers \ (X) \end{array}$$

$$\left[\operatorname{Cr}(\operatorname{C_2O_4)_3}\right]^{3-}$$

X + Y = 2 + 0 = 2.0