

Stereoisomers and optical isomers are typical for tetrahedral and octahedral complexes.

Stereoisomers have the same atoms, same sets of bonds, but differ in the relative orientation of these bonds.

Ignoring special cases involving esoteric ligands, then:

Geometric isomers are possible for both square planar and octahedral complexes, but not tetrahedral.

Optical isomers are possible for both tetrahedral and octahedral complexes, but not square planar.

The earliest examples of stereoisomerism involve complexes of Co(III). In 1889, Jorgensen observed purple and green salts of $[\text{CoCl}_2(\text{en})_2]^+$, which Werner later correctly identified as the cis- and trans- geometric isomers. In 1911, the first resolution of optical isomers was reported by Werner and King for the complexes cis- $[\text{Co}_X(\text{NH}_3)(\text{en})_2]^{2+}$, where X=Cl⁻ or Br⁻.