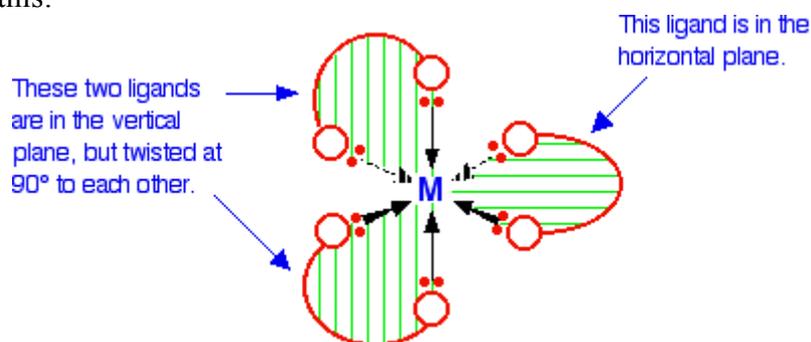


Chemguide – questions

COMPLEX IONS - SHAPES

1. What shapes are the following ions? In each case, name the shape, and draw a diagram showing the shape. Make clear what sort of bonding is involved.
 - a) $[\text{AlF}_6]^{3-}$
 - b) $[\text{CuCl}_4]^{2-}$
 - c) $[\text{Cu}(\text{NH}_3)_4(\text{H}_2\text{O})_2]^{2+}$
 - d) $[\text{Co}(\text{NH}_3)_6]^{2+}$
2.
 - a) Cisplatin is an anticancer drug with the formula $\text{Pt}(\text{NH}_3)_2\text{Cl}_2$. Draw the structure for cisplatin and name its shape.
 - b) Cisplatin has a geometric isomer. Draw the structure of that as well and name its shape.
3. Octahedral complexes involving bidentate ligands such as 1,2-diaminoethane or ethanedioate (oxalate) ions have optical isomers. A simplified diagram of one such complex of a metal M (omitting the charge on the ion and concentrating on the important bits of the ligands - the lone pairs) looks like this:



- a) Redraw this structure, and then draw its optical isomer.
- b) Why do these structures have optical isomers?