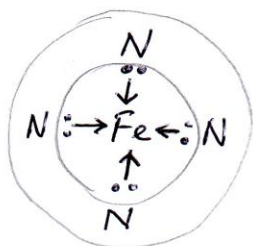


A quadridentate ligand .

- a quadridentate ligand has 4 lone pairs, and all of which can bond to the central metal ion.
- example in haemoglobin .
- iron ion trapped in the haem structure .



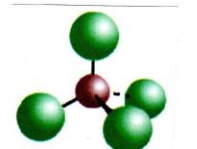
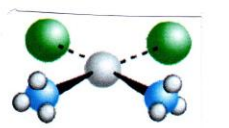
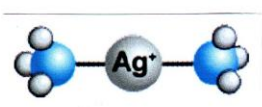
### Haem

a complex containing iron(II) which is responsible for the red colour in blood and for the transport of oxygen by red blood cells .

- the iron forms 4 co-ordinate bonds with the haem, but still has space to form two more - one above and one below the plane of the ring .

## Co-ordination number & shape

- the shape of a complex is governed by the number of ligands around the central ion.
- the co-ordination number gives the number of ligands around the central ion.
- a change of ligand can affect the co-ordination number.

| co-ordination no. | shape         | example                                  | model                                                                                 |
|-------------------|---------------|------------------------------------------|---------------------------------------------------------------------------------------|
| 6                 | octahedral    | $[\text{Cu}(\text{H}_2\text{O})_6]^{2+}$ |   |
| 4                 | tetrahedral   | $[\text{CuCl}_4]^{2-}$                   |  |
| 4                 | square planar | $\text{Pt}(\text{NH}_3)_2\text{Cl}_2$    |  |
| 2                 | linear        | $[\text{Ag}(\text{NH}_3)_2]^+$           |  |