Answer on Question#37708-Chemistry-Inorganic Chemistry

Questions

1) Help me naming this complex compounds. Thank You in advance.
$[CoCl_2(NH_3)_4]NO_2$
$[Cu(NH_3)_4]^{2+}[PtCl_4]^{2-}$
$[CoCl(NH_3)_4(NO_2)]Cl$
$[Co(N_3)(NH_3)_5]SO_4$

2) What are ambidentate ligands? Give Examples.

Answers

1)
$[CoCl_2(NH_3)_4]NO_2$ – tetraamminedichlorocobalt(III) nitrite

$[Cu(NH_3)_4]^{2+}[PtCl_4]^{2-}$ – tetraamminecopper(II) tetrachloroplatinate(II)

$[CoCl(NH_3)_4(NO_2)]Cl$ – tetraamminechloronitrocobalt(III) chloride (if NO_2 group is attached to the central atom by N (O_2N^-)) or tetraamminechloronitritocobalt(III) chloride (if NO_2 group is attached to the central atom by O (ONO^-))

$[Co(N_3)(NH_3)_5]SO_4$ – pentaammineazidocobalt(III) sulphate

2)
The ambidentate ligands are ligands, which can attach to the central atom in two places but not both.
For example, nitrite ion (NO_2^-) is ambidentate ligand, because it can be attached either by N atom or by O.
Another examples of ambidentate ligands are:

- sulphite (SO_3^{2-})
- thiocyanate (SCN^-) – isothiocyanate (NCS^-)
- selenocyanate ($SeCN^-$) – isoselenocyanate ($NCSe^-$)