

# NCERT/CBSE CHEMISTRY CLASS 12 textbook

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## CHAPTER NINE

Coordination Compounds

9.20

A solution of  $[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$  is green but a solution of  $[\text{Ni}(\text{CN})_4]^{2-}$  is colourless. Explain.

$[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$  is green but a solution of  $[\text{Ni}(\text{CN})_4]^{2-}$  is colourless because of the differences in the number of unpaired electrons present in these molecules. In both the complexes the oxidation state of nickel is +2. The difference is in the type of ligands attached to the central nickel atom. Cyanide is a strong ligand and allows the pairing up of the electrons, leaving no unpaired electrons, hence it is colourless. Water is a weak ligand and when it co-ordinates with nickel no pairing of electrons takes place. Therefore nickel has 2 unpaired electrons in the complex  $[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$ .

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