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Differentiation of isomeric coordination geometries by metal valence: A structural study of its origin

AMITAVA PRAMANIK* and ANIMESH CHAKRAVORTY
Department of Inorganic Chemistry, Indian Association for the Cultivation of Science, Calcutta 700 032, India

Different oxidation states of the same metal ion may have distinctly different bonding qualities. For example Ru^{II} and Os^{II} are good π-donors but their trivalent states are not. Isomeric coordination spheres generally differ in metal-ligand bonding and steric properties. It is therefore expected that different metal oxidation states may be able to differentiate isomeric coordination spheres in one way or the other. This theme has been examined with special emphasis on the structural basis of such differentiation in the cases of some mixed ligand complexes of type $[ML_2)PPh_3)_2]^{0/+}$ where L is a bidentate 'innocent' ligand like $ROCS_2^-$, $RSCS_2^-$, $R_2NCS_2^-$ etc. and M = Ru, Os.

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*For correspondence