Exploring Structural Implications of diphosphinamine ligands in Medicine and Catalysis

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Phosphine ligands are considered by many as one of the most significant class of ligands in organometallic chemistry. The search of new phosphine chelators, as well as the subsequent functionalization thereof, is a continuing process in order to induce appropriate properties for highly effective catalyst and to a lesser extend in medicinal purposes. Of particular interest is the search for water-soluble and highly stable ligands that can preserve their aquatic solubility even after metal coordination.

In this study, we aim to improve the efficiency of middle/late transition metal homogeneous catalysts (*i.e*. Re, Rh, Pd and Pt) and *fac*-$[M(CO)_3]$ (M = Re and Tc) radiopharmaceutical synthons by selectively introducing monodentate and bidentate phosphine ligands consisting of various electronic and steric properties. The use of systematically altered bidentate phosphine ligands such as diphosphinoamine ligands has already been reported to show high selectivity improvements in catalytic reactions such as ethylene tri- and tetramerization [1].

A series of diphosphinoamine ligands was synthesized using methods described in literature [2, 3]. These ligands were then coordinated to various metal (i.e. Re(I), Tc(I), Pt(II) and Pd(II)). Results obtained from the biological analysis and catalytic evaluations have opened up a new window of opportunities for such compounds.

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