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Solution and solid state effects of coordinated ligands in rhenium (I) complexes

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In the last few years the coordination chemistry of rhenium and technetium has gained major interest for the possible use in radiopharmacy, due to its compact size, its low positive charge, coordination properties, d6 low-spin configuration and significant stability. This interest was further fuelled when Alberto remarkably synthesized fac-[99mTc-(CO)3(H2O)3] from [99mTcO4]- in aqueous medium and under mild conditions. Several fac-[M(CO)3]+ (M = Re, 99mTc) type complexes have been synthesized to date with a large number of ligand systems.[1,2] The three labile aqua ligands on the starting synthon fac-[Re(CO)3(H2O)3]+ can easily be substituted by a variety and/or combinations of ligands producing stable compounds and potential radiopharmaceuticals with many different characteristics. Our interest focuses on the fac-[Re(CO)3]+ moiety and related compounds by adopting the [2+1] approach.[3] The solid state behaviour of the complexes are explored as well as different effects such as the charge of the complexes as well as the effect of different types of donor atoms and electron donating or withdrawing systems. The influence of coordinated bidentate ligands on the rate of substitution in solution, by a variety of entering ligands, is also investigated. Crystal structures of Re(I) tricarbonyl tropolonato complexes with various monodentate incoming ligands were obtained in the study and will form part of this presentation.

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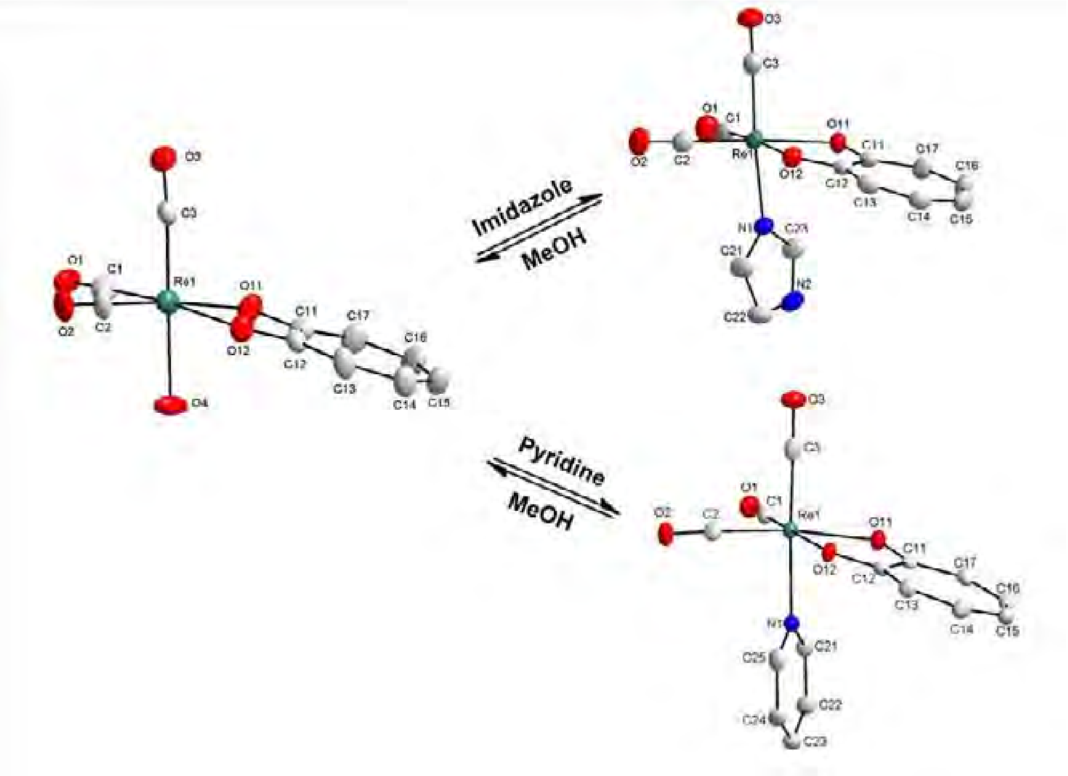

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