

MS32-P2 Rhenium Monomers vs. Manganese Dimers – what is driving the linkage ?

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During the design of pharmaceuticals, in particular those containing a transition metal radionuclide, several factors should always be kept in mind, such as, the half-life of the radionuclide, type of radiation, oxidative state, stability and biological suitability of the organometallic complex as well as the final coordination mechanism of the ligand to the radionuclide [1-3].

Our interest in the tricarbonyl complexes of the Group 7 Manganese Triad, namely *fac*-[M^I(CO)₃] (M = Mn, Re and Tc) has resulted in several unexpected structural results [4-7]. The radionuclides of rhenium and technetium show distinct advantages for theranostics complexes [8] with the technetium diagnostic application, combined with the therapeutic potential of rhenium [9] as well as the anti-inflammatory potential of superoxide dismutase manganese mimics [10]. As always in pharmaceutical development the final coordination mode of the organometallic complexes in solid and solution are of importance and ideally identical.

We report here several monomer and dimeric complexes of the manganese, technetium and rhenium triad that have formed with identical ligand systems in the solid state. In solution state, however all complexes indicate monomer coordination stabilised by the coordinating solvents. The possible crystallization factors which drive this monomer vs. dimer solid state observation will be discussed as well the kinetic substitution of the *fac*-[Re/Mn(N,O-Bid)(CO)₃(X)] (where N,O-Bid = N and O donor atoms of mono-negative bidentate ligands, X = methanol, aqua, acetone) on the 6th solvento position.

References:

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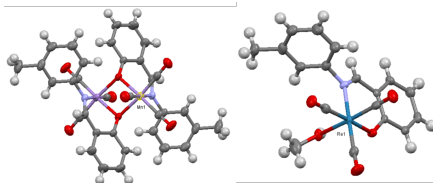


Figure 1. The manganese and rhenium dimeric / monomeric structures of *fac*-[M(N,O-Bid)(CO)₃(X)] complexes.

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