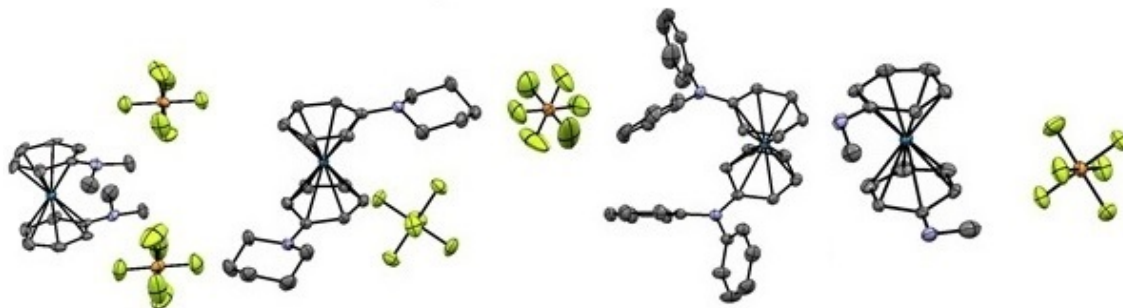


Towards the direct synthesis of nitrogen functionalized bis arene complexes of Re and $^{99(m)}\text{Tc}$

D. Hernández Valdés¹, G. Meola¹, H. Braband¹, B. Spingler¹, R. Alberto^{1*}

¹University of Zurich, Winterthurerstrasse 190, CH-8057 Zurich, Switzerland

Functionalized sandwich complexes of transition metals are used as precursors for numerous reactions with applications in different fields, including medicinal inorganic chemistry and catalysis¹⁻³. Re(I) and $^{99(m)}\text{Tc(I)}$ bis arene complexes represent a new promising route to low valent, nonpolar, and inert compounds¹ and could represent building blocks for the development of new potential pharmaceuticals and catalyst. The synthesis of technetium and rhenium bis arene complexes was first established by Fischer and Hafner in the 1950s and 1960s using AlCl_3 as an activation agent. More recently, some modification to the synthesis have been done by Kudinov³ and in our group¹ but still AlCl_3 is needed in the reaction. The high reactivity of AlCl_3 limits the synthesis of Re(I) and $^{99(m)}\text{Tc(I)}$ bis arene complexes to only alkyl arene substituents. Here, we present the first direct synthesis of nitrogen functionalized bis arene complexes of rhenium(I). Different ligands presenting sp^3 and sp^2 nitrogen were evaluated. Whereas the presence of sp^2 nitrogen in the ligand hampers the formation of sandwich complexes, promising results have been obtained for ligands containing sp^3 nitrogen. The synthesis of $[\text{rhenium}(\text{I})(N,N\text{-dimethylaniline})_2]^+$ analogue was performed following Benz procedure¹ as a proof of applicability in technetium chemistry. Optimization of reaction conditions and purification procedures, as well as the search for other suitable ligands are currently on going.



[1] M. Benz, H. Braband, P. Schmutz, J. Halter, R. Alberto, *Chem. Sci.*, **2015**, 6, 165-169

[2] G. Pampaloni, *Coord. Chem. Rev.*, **2010**, 254, 402-419.

[3] E. A. Trifonova, D. S. Perekalin, K. A. Lyssenko, A. R. Kudinov, *J. Organomet.Chem.*, **2013**, 727, 60-63.