

Influence of various bidentate Ligands on Rh(I) Complexes

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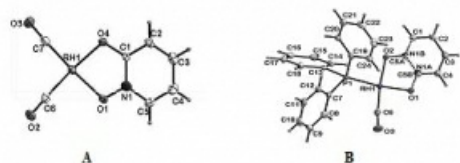
There are several essential reactions with regard to homogeneous catalysis that transition metal complexes can undergo, such as oxidative addition, insertion, substitution and reductive elimination. A key to understand catalytic processes requires research on homogeneous catalysis and the relationships between activity and catalyst structure. Oxidative addition is one type of reaction that can very often be identified in the mechanistic scheme of catalytic processes.

The electronic and steric modifications to tertiary phosphines, often used as ancillary ligands, can lead to more effective modelling of catalysts. These phosphine ligands are exceptionally well suited to manipulate the electron density and / or steric accessibility of the metal centre.

In this study, the oxidative addition of [Rh(BID)(CO)(PX₃)] (where PX₃ = PCy₃, P(o-Tol)₃, PPh₃, PPh₂C₆F₅, P(p-ClC₆H₄)₃, P(p-MeOC₆H₄)₃, (BID = different bidentate ligands) with iodomethane, to give Rh(III) alkyl complexes, were studied in a range of different solvents in an attempt to separate and quantify the steric and electronic effects of the phosphine ligand. These complexes were synthesized, studied by IR, NMR and X-ray crystallography and will be discussed in this presentation. Figure 1 shows the structures of two of the rhodium(I) holo complexes. Figure 1 shows Schematic presentations of (a) Dicarbonyl(pyridin-2-olate-1-oxido-2O,O')-rhodium(I) [1] and (b) Carbonyl(2-oxopyridin-1(2H)-olato-2O,O') (triphenylphosphine-P)rhodium(I) [2].

[1] Elmakki, M.A., Koen, R., Drost, R.M., Venter, J. A. (2016) Z. Kristallogr. NCS. 231(3), 703-705.

[2] Elmakki, M.A., Koen, R., Drost, R.M., Alexander, O.T., Venter, G.J.S., Venter, J.A. (2016) Z. Kristallogr. NCS. 231(3), 781-783.



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