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María José Ruiz: in search for insertion mechanisms

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Of late, Dr. Ruiz's research has focused on multi-dentate ligands involved specifically in Ta complexes. Her research group views multi-dentate ligands as a gateway to studying fundamental organometallic reactions (i.e. insertion reactions). By varying ligand groups of early transition metal complexes, they have tuned the reactivity of the metallic center (in general, a tantalum atom). The reactivity of these compounds is gaged by their response to nucleophiles (e.g. isocyanides). Looking at both alkyl and hydride complexes with tri-dentate ligands, they have deduced insertion reactions are stabilized by a κ^3 ligand. Both synthetic and computational investigations have led this group to conclude steric effects dominate over electronic effects in isocyanide migratory insertion in complexes of early transition metals (shown in Fig. 1).

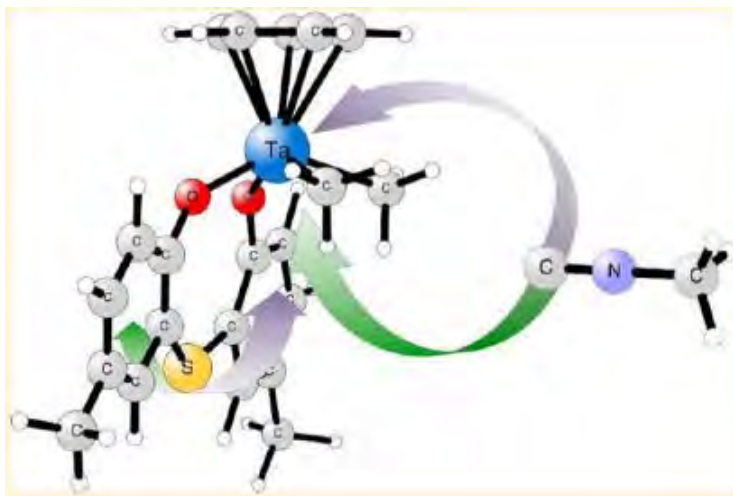


Figure 1: An illustration of migratory insertion of isocyanide into a tantalum complex with a tridentate ligand (bonded also to two methyl and one cp groups). This picture also indicates possible *fac* \rightarrow *mer* rearrangement. Reprinted from *Organometallics* 2012, **31**, 70527062 (link 2 below).

[dx.doi.org/10.1021/om3011728](https://doi.org/10.1021/om3011728)

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