

Professor Steven P. Nolan

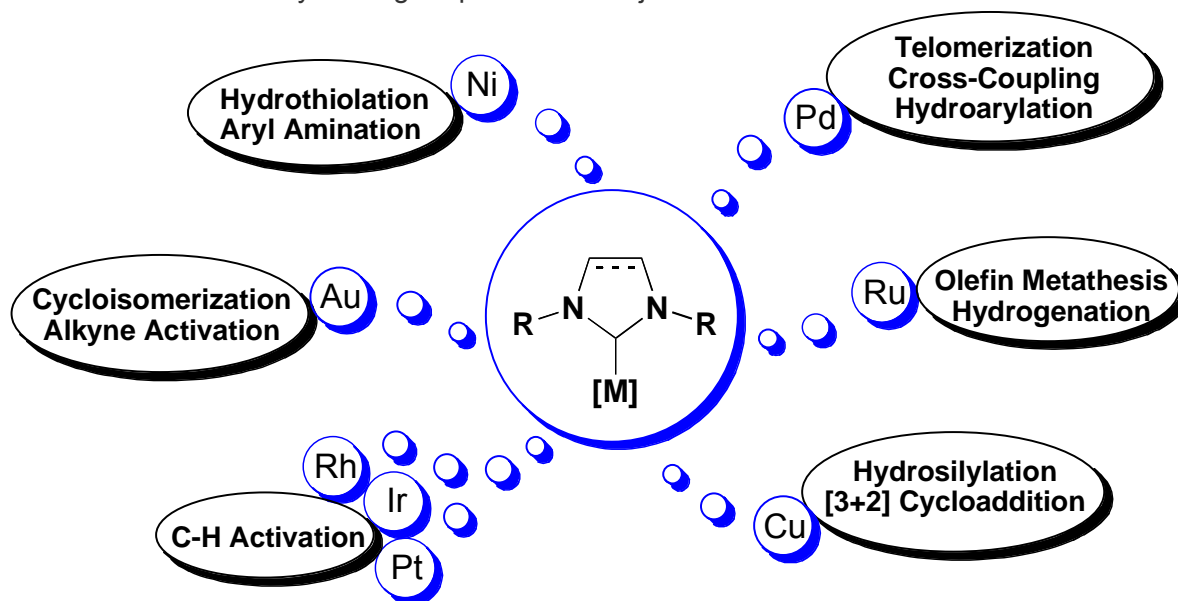
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Research Interests: organometallic chemistry and homogeneous catalysis



The *N*-heterocyclic carbenes (NHC) have gained great popularity in organometallic chemistry and homogeneous catalysis since their first isolation in 1991. We have explored the coordination chemistry of the NHC with transition metals, thereby generating novel catalyst compositions. These new pre-catalysts lead to extremely attractive reactivity/stability profiles in numerous organic transformations. We have reported significant breakthroughs in ruthenium-based olefin metathesis, palladium cross-coupling reactions, copper-based reductive hydrosilylation and most recently in gold-mediated transformations. In order to understand ligand properties, physico-chemical studies are carried out on ligand families to then use the best candidate in given metal-based reactions. Catalyst design represents a major thrust of our research.



SELECTED RECENT PUBLICATIONS

1. Carboxylation of C-H Bonds using *N*-Heterocyclic Carbene Gold (I) Complexes. Boogaerts, I. I. F.; Nolan, S. P. *J. Am. Chem. Soc.* **2010**, *132*, 8858-8859.
2. A *N*-Heterocyclic Carbene Gold Hydroxide Complex: A Golden Synthone Gaillard, S.; Slawin, A. M. Z.; Nolan, S. P. *Chem. Commun.* **2010**, *46*, 2742-2744.
3. *N*-Heterocyclic Carbenes in Late Transition Metal Catalysis. Díez-González, S.; Marion, N.; Nolan, S. P. *Chem. Rev.*, **2009**, *109*, 3612-3676.
4. Activation of H₂ by Palladium(0): Formation of the Mononuclear Dihydride Complex trans-[Pd(H)₂(IPr)(PCy₃)]. Fantasia, S.; Egbert, J. D.; Jurčík, V.; Cazin, C. S. J.; Jacobsen, H.; Cavallo, L.; Heinekey, D. M.; Nolan, S. P. *Angew. Chem. Int. Ed.* **2009**, *49*, 5182-5186.