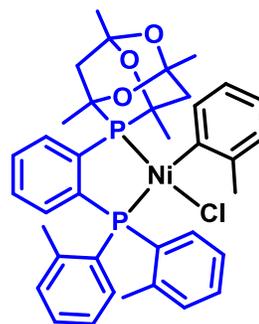


Move Over Palladium: Developing PAd-DalPhos/Nickel-Catalysed C-N Cross-Couplings

Prof. Mark Stradiotto

Dalhousie University, Department of Chemistry, Halifax, Nova Scotia B3H 4R2

While palladium-based synthetic methods including C(sp²)-N cross-coupling (aka Buchwald-Hartwig amination) are useful, the cost and rarity of palladium provides motivation for the development of alternative protocols that make use of inexpensive and abundant base-metals. Nickel-catalyzed C(sp²)-N cross-coupling holds significant promise in this regard; however, little is known regarding the



types of supporting ancillary ligands that can enable nickel to do the work of palladium. In response, our research group has recently developed the PAd-DalPhos ligand, and have shown that the derived complex (PAd-DalPhos)Ni(*o*-tolyl)Cl (see inset) is a superlative pre-catalyst for C(sp²)-N cross-couplings encompassing a broad substrate scope with respect to both the amine (e.g., ammonia, alkylamines, and amides) and aryl electrophile coupling partners, as well as challenging C(sp²)-O cross-couplings.[1] The development of this catalytic chemistry, along with details of our on-going experimental and computational mechanistic investigations, will be the focus of this presentation.

[1] Lead publications: Stradiotto and co-workers: (a) *Nature Comm.* **2016**, 7, 11073. (b) *J. Am. Chem. Soc.* **2018**, 140, 5023.

Biography: Prof. Mark Stradiotto received his BSc (Hons.) in Applied Chemistry (1995) and PhD in Organometallic Chemistry (1999) from McMaster University, the latter under the supervision of Profs. Michael A. Brook and Michael J. McGlinchey. After conducting research as an NSERC Postdoctoral Fellow at the University of California at Berkeley with Prof. T. Don Tilley (1999-2001), Mark moved to the Department of Chemistry at Dalhousie University where he now holds the rank of Professor with tenure. Mark has been named a Synlett/Synthesis Promising Young Professor Journal Awardee, and was awarded the Canadian Society for Chemistry 2012 Strem Chemicals Award for Pure or Applied Inorganic Chemistry. In July 2013, Mark was named the Dalhousie University Alexander McLeod Professor of Chemistry, and in 2017 he was named a Fellow of the Royal Society of Chemistry (UK). In 2018 Mark was the recipient of the Dalhousie University Faculty of Science Award for Teaching.