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Heterogenized palladium pincer complexes for the cross-coupling reaction of styrenes and iodonium salts

Davi S. Leite[1], Daniela Zanchet[1] and Julio C. Pastre[1*]
1) Institute of Chemistry, State University of Campinas - UNICAMP
****e-mail: jpastre@unicamp.br***

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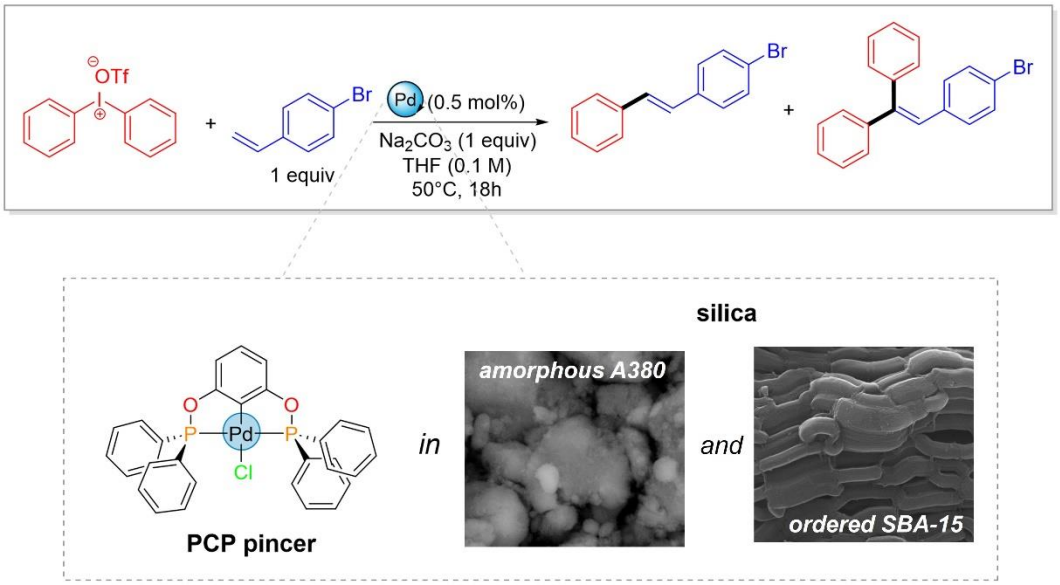
ABSTRACT

Phosphine-based palladium pincer complexes were initially thought of as readily steric- and electronically controllable, conferring a suitable balance between thermal stability and reactivity[1]. When submitted to the mild reductive conditions of typical Heck and Suzuki couplings, however, these were shown to easily decompose to metal nanoparticles (NP), the active form of the catalyst[2]. To take advantage of the NP formation, air- and moisture-stable phosphinite PCP Pd-pincer complexes were supported at 1 wt.% Pd in both amorphous and ordered silica by wet impregnation and evaluated in the coupling of styrenes and iodonium salts, which would follow a Pd(II)-Pd(IV) cycle in a homogeneous phase[3]. The best heterogeneous catalyst afforded 97% conversion and 17:3 selectivity to the monoarylated product by GC analysis, while both homogeneous and physical mixtures of support + complex yielded only traces of products. Further support pore structure and charge of the complex are also under evaluation and will be presented.



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REFERENCES

(1) Peris, E.; Crabtree, R. H. Key Factors in Pincer Ligand Design. *Chem Soc Rev* **2018**, *47* (6), 1959–1968. https://doi.org/10.1039/c7cs00693d.

(2) Phan, N. T. S.; Van Der Sluys, M.; Jones, C. W. On the Nature of the Active Species in Palladium Catalyzed Mizoroki-Heck and Suzuki-Miyaura Couplings - Homogeneous or Heterogeneous Catalysis, a Critical Review. *Advanced Synthesis and Catalysis*. April 2006, pp 609–679. https://doi.org/10.1002/adsc.200505473.

(3) Juliá-Hernández, F.; Arcas, A.; Vicente, J. Providing Support in Favor of the Existence of a Pdii/Pdiv Catalytic Cycle in a Heck-Type Reaction. *Chemistry - A European Journal* **2012**, *18* (25), 7780–7786. https://doi.org/10.1002/chem.201103679.