

# PHOSPHINITE POCN PINCER LIGANDS: SYNTHESIS AND COORDINATION CHEMISTRY

Gudun K. A., Segizbayev M., Khalimon A.Y.

*Nazarbayev University, Department of Chemistry, School of Science and Technology, Astana, Kazakhstan*

*kristina.gudun@nu.edu.kz; andrey.khalimon@nu.edu.kz*

Transition metal pincer complexes are complexes with rigid tridentate ligands, in which three donor atoms are located in meridional fashion. Over the past few decades, pincer complexes have attracted significant interest from a large number of research groups. Such compounds have been extensively studied in C-H, C-C, C-N, C-O and recently N-H and O-H activation reactions [1]. The pioneering research by Shaw *et al.* on 1,3-bis(phosphino)phenyl (PCP) pincers has inspired many others and during the past two decades transition metal pincers have evolved into powerful catalysts for dehydrogenation of alkanes, Heck type reactions, and many other processes. The rigid nature and easily tunable steric and electronic properties of pincer ligands provide a unique balance of stability vs. reactivity for pincer complexes, often enhancing the selectivity of the catalytic reactions [2]. Whereas chemistry of transition metal pincer complexes of symmetrical EXE type ligands with neutral 2e donor side-arms E (e.g. NR<sub>2</sub>, PR<sub>2</sub> etc.) and either neutral or anionic 2e donors in the bridgehead position X (e.g. C<sup>-</sup>, N<sup>-</sup>, N, etc.) is now at the advanced stage of development [1-2], significant opportunities continue to exist in this area of organometallic chemistry. Among a variety of pincer ligands known in the literature, the chemistry of unsymmetrical pincer complexes with different side-arm donors, such as PXN, PXS, etc. (X = C<sup>-</sup>, N<sup>-</sup>, N), is studied to a lesser extent and restricted to either neutral ligands or anionic ligands, having an anionic donor at the bridgehead position. Such ligands usually act as "spectator" ligands, allowing for unique balance of stability vs. reactivity for pincer complexes. Although pincer complexes having anionic groups in the side-arm positions are known, the examples of application of such systems in catalysis are scarce [3]. Here we report a series of novel imino- and aminophosphinite pincer ligands (POCN) derived from 3-hydroxybenzaldehyde by stepwise installation of imino/amino and phosphinite functionalities. Coordination chemistry of these ligands with late transition metals, such as Fe, Ir and Ni, was studied.

## References:

1. MORALES-MORALES, D., JENSEN, C.M. *The Chemistry of Pincer Compounds*. 2011. Amsterdam: Elsevier
2. CHOI, J., MacArthur, A.H.R., BROOKHART, M., GOLDMAN, A.S. *Chem. Rev.* 2011. **111**, p.1761.
3. SPASYUK, D.M.; ZARGARIAN, D. *Inorg. Chem.* 2010. 49, p.6203.