

CoE EQUITANT Seminar
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Acyclic aminocarbenes for emergent catalytic applications

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Acyclic diaminocarbenes (ADCs) represent a contemporary class of ancillary ligands for catalytic applications.^{1,2} Being structural analogues of *N*-heterocyclic carbenes, ADC species possess comparable electronic and steric properties, and their metal complexes can be prepared via several easily adjustable approaches including nucleophilic addition to metal-bound isocyanides, recognized as the most versatile route.

In pursuit of our studies on chemistry of metal-aminocarbenes, we have developed a route leading to a range of novel types of metal-ADC complexes starting from isocyanides (**Figure 1**).^{3,4} Prepared M-ADCs were employed as catalysts for various transition metal-catalysed reactions demonstrating outstanding efficiencies. Identification of the true catalytic species allowed to shed light on mechanisms of the catalytic action of aminocarbene catalysts and to extend the frontiers of their application.^{1,3,4}

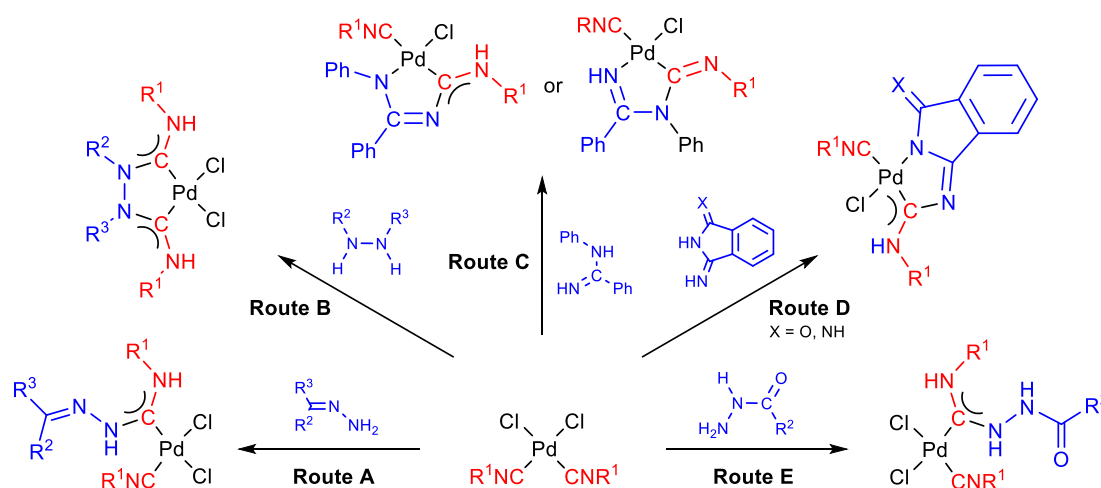


Figure 1. Examples of metal-ADC species prepared from isocyanide precursors.

The essential goals of this report are: (i) to provide an overview of recent data on preparation of metal-ADC complexes, (ii) to compare the catalytic properties of M-ADCs against M-NHCs and M-PR₃ species, and (iii) to draw attention to the advantages that application of ADC catalysts give to synthetic organometallic chemistry and catalysis.

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References

- [1]. Boyarskiy, V. P.; Bokach, N. A.; Luzyanin, K. V.; Kukushkin, V. Yu. *Chem. Rev.* **2015**, *115*, 2698. [2]. Boyarskiy, V. P.; Luzyanin, K. V.; Kukushkin, V. Yu. *Coord. Chem. Rev.* **2012**, *256*, 2029. [3]. Rocha, B. G. M.; Valishina, E. A.; Chay, R. S.; Guedes da Silva, M. F. C.; Buslaeva, T. M.; Pombeiro, A. J. L.; Kukushkin, V. Yu.; Luzyanin, K. V. *J. Catal.* **2014**, *309*, 79. [4]. Kinzhalov, M. A.; Timofeeva, S. A.; Luzyanin, K. V.; Boyarskiy, V. P.; Yakimanskiy, A. A.; Haukka, M.; Kukushkin, V. Yu. *Org*

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