

Towards Preparation of 3d Metal Complexes with Tridentate NHC Ligands

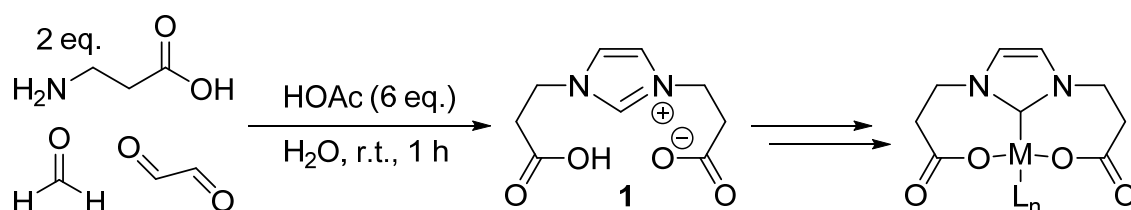
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Transition metal complexes featuring N-heterocyclic carbene (NHC) ligands are well established in synthesis and for a number of catalytic applications [1]. The excellent tunability of NHC ligands has made them a heavily researched ligand platform, which led to the preparation of neutral and charge-bearing tethered NHC ligands with chelating capability, among many others [2]. Symmetrically tethered, tridentate N-heterocyclic carbenes bearing two negative charges can be prepared in a particularly facile manner from cheap and abundant amino acids, glyoxal and formaldehyde (Scheme 1) [3]. However, there are only few accounts of transition metal complexes with NHC ligands with the structural motif of **1** [4], and, to the best of our knowledge, no account of the ligand actually binding in a tridentate fashion.

Herein we present our attempts to prepare 3d metal complexes with symmetric, dianionic tridentate NHC ligands derived from amino acids (**1**).



Scheme 1: Preparation of NHC ligand **1** from β-alanine and envisioned motif for 3d metal complexes.

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[2] a) O. Köhl, *Functionalised N-Heterocyclic Carbene Complexes*, John Wiley & Sons, Chichester, United Kingdom, **2010**; b) F. Pape, J. F. Teichert, *Eur. J. Org. Chem.* **2017**, 4206–4229.

[3] D. Esposito, S. Kirchhecker, M. Antonietti, *Chem. Eur. J.* **2013**, *19*, 15079–15100.

[4] a) M. A. Reynoso-Esparza, *et. al.*, *Polyhedron* **2014**, *81*, 564–571; b) E. Steeples, A. Kelling, U. Schilde, D. Esposito, *New J. Chem.* **2016**, *40*, 4922–4930.