

## [(C<sub>3</sub>H<sub>4</sub>N<sub>2</sub>)<sub>2</sub>Au]Cl – The ‚Mother‘ of Gold(I) NHCs

Kunz, P. C., Düsseldorf D, Wetzel, C., Düsseldorf D, Kögel, S., Düsseldorf D, Hamacher, A., Düsseldorf D, Kassack, M. U., Düsseldorf D, Spingler, B., Zürich Ch

Dr. Peter C. Kunz, Heinrich-Heine-Universität Düsseldorf, Universitätsstr. 1, D-40225 Düsseldorf, Germany, email: peter.kunz@uni-duesseldorf.de

Since the first synthesis of stable *N*-heterocyclic carbenes (NHCs) as a “chemical curiosity” their application as versatile catalysts has stimulated the field and numerous stable carbenes and metal complexes have been prepared.<sup>[1]</sup> The stability of the metal-carbon bond under physiological conditions has recently allowed therapeutic investigations.<sup>[2]</sup> Although imidazol-2-ylidens are the most commonly used NHCs, other NHCs are known as well.<sup>[3]</sup>

The parental NHC, imidazol-2-ylidene, which is a tautomer of imidazole, and its metal complexes have been explored theoretically to calculate structural and electronic parameters of NHC complexes.<sup>[4,5]</sup> Surprisingly, although there is a plethora of NHC containing compounds, no example contains the parental imidazol-2-ylidene ligand.

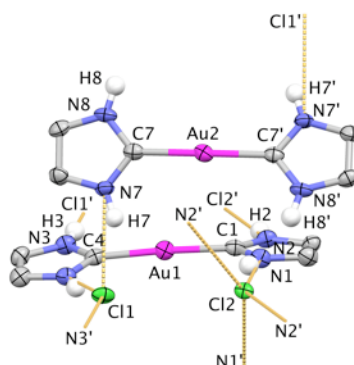


Figure 1: Molecular structure of bis(imidazol-2-ylidene)gold(I)chloride, [(C<sub>3</sub>H<sub>4</sub>N<sub>2</sub>)<sub>2</sub>Au]Cl.

Here we present a simple and versatile route towards metal complexes of *N*-unsubstituted NHCs starting from imidazole. Some preliminary physicochemical and pharmacological properties of the gold(I) compound [(C<sub>3</sub>H<sub>4</sub>N<sub>2</sub>)<sub>2</sub>Au]Cl as well as typical reactions thereof are presented.

### Literature:

[1] L. Mercks, M. Albrecht, *Chem. Soc. Rev.*, **2010**, 39, 1903-1912. [2] H. G. Raubenheimer, S. Cronje, *Chem. Soc. Rev.*, **2008**, 37, 1998-2011. [3] F. E. Hahn, M. C. Jahnke, *Angew. Chem. Int. Ed.*, **2008**, 47, 3122-3172. [4] H. G. Raubenheimer, P. J. Oliver, L. Lindeque, M. Desmet, J. Hrusak, G. J. Kruger, *J. Organomet. Chem.*, **1997**, 544, 91-100. [5] D. Nemcsok, K. Wichmann, G. Frenking, *Organometallics*, **2004**, 23, 3640-3646.