

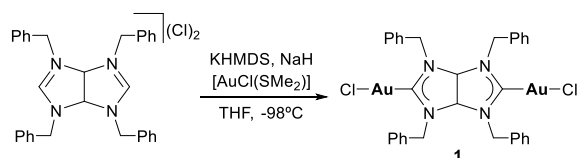
Supramolecular Self-Assembly Structures from a Di-Au(I) Complex with a Hinge-Shaped Ligand

Susana Ibáñez, Eduardo Peris,* Macarena Poyatos and Ana Gutiérrez-Blanco

Institute of Advanced Materials (INAM). Universitat Jaume I. Av. Vicente Sos Baynat s/n, Castellón, E-12071, Spain.
angutier@uji.es

Key Words: Supramolecular • N-heterocyclic • Gold • Hinge • Self-assembly

Among N-heterocyclic carbenes (NHCs), polytopic NHC ligands have emerged as promising tools in the design of supramolecular structures.¹ In this regard, our group of research designed fused-bis(imidazolinylidene) ligands with folded geometry and reported their coordination to Rh and Ir,²⁻³ and Pd.³ More recently, one of these hinge-shaped ligands allowed us to prepare the Au(I)-based dimetallic complex **1** (Scheme 1).

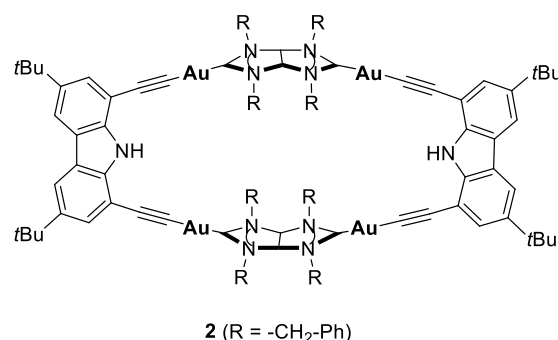


Scheme 1. Synthesis of di-Au(I) complex 1

The combination of the folded geometry of the ligand with a coinage metal, extensively employed in the synthesis of supramolecular assemblies,⁴⁻⁵ makes complex **1** a perfect synthon for the preparation of metallo-supramolecular structures by means of the metal-directed self-assembly approach. This strategy allows the generation of sophisticated molecular architectures from relatively easy materials.⁶

With this in mind and taking into account that Au(I) complexes are prone to form stable linear compounds with acetylides, we reacted complex **1** with 3,6-di(*tert*-butyl)-1,8-diethynyl-9H-carbazole in the presence of a base. This reaction allowed the preparation of the supramolecular complex **2** (Scheme 2).

The synthesis of other Au(I) supramolecular complexes with inner cavities of different size by means of the combination of **1** with the appropriate alkyne, is currently underway in our laboratory.



Scheme 2. Tetra-Au(I) complex 2

References

- [1] Schmidtendorf, M.; Pape, T.; Hahn, F. E. *Angew. Chem. Int. Ed.* **2012**, *51*, 2195-2198.
- [2] Prades, A.; Poyatos, M.; Mata, J.; Peris, E. *Angew. Chem. Int. Ed.* **2011**, *50*, 7666-7669.
- [3] Valdés, H.; Poyatos, M.; Peris, E. *Organometallics* **2013**, *32*, 6445-6451.
- [4] Altmann, P. J.; Pöthig, A. *J. Am. Chem. Soc.* **2010**, *132*, 4572-4573.
- [5] Rit, A.; Pape, T.; Hahn, F. E. *J. Am. Chem. Soc.* **2016**, *138*, 13171-13174.
- [6] Fujita, M.; Tominaga, M.; Hori, A.; Therrien, B. *Acc. Chem. Res.* **2005**, *38*, 369-378.

