Universidad de Oviedo

Gold(I) operational in synergistic catalysis for the intermolecular α -addition reaction of aldehydes across allenamides

Alberto Ballesteros, Silvia González-Pelayo, Pablo Morán Poladura and José M. González

Departamento de Química Orgánica e Inorgánica and Instituto Universitario de Química Organometálica "Enrique Moles" Universidad de Oviedo. C/ Julián Clavería 8, Oviedo 33006, Spain

Asymmetric organocatalysis is well established as a powerful tool to promote chemical transformations with good yields and enantioselectivities.¹ For years, gold(I) has been extensively used for the activation of unsaturated compounds toward different nucleophiles.² These two strategies can be combined in a synergistic manner³ to afford new chemical transformations.⁴

Herein we report the synergistic combination of gold(I) catalysis with L-proline and L-proline-derived organocatalysts to activate both aldehydes and allenamides respectively.^{5a} With this strategy we were able to build all-carbon quaternary stereocenters with moderate yield and enantioselectivity.^{5b} In some cases certain additives were necessary to modulate the selectivity.

XXVI
REUNIÓN BIENAL
de Química Orgánica
Punta Umbría · Huelva · 14 - 17 Junio 2016

1. a) P. Melchiorre, M. Marigo, A. Carlone, G. Bartoli, *Angew. Chem. Int. Ed.* **2008**, 47, 6138; b) U. Scheffler, R. Mahrwald, *Chem. Eur. J.* **2013**, 19, 14346; c) C. M. R. Volla, L. Atodirese, M. Rueping, *Chem. Rev.* **2013**, 114, 2390; d) B. M. Paz, H. Jiang, K. A. Jorgensen, *Chem. Eur. J.* **2015**, 21, 1846.
2. a) A. S. K. Hashmi, *Chem. Rev.* **2007**, 107, 3180; b) M. Beller, C. Bolm, *Transition Metals for Organic Synthesis: Building Blocks and Fine Chemicals*, second revised and enlarged edition **2008**; c) Z. Li, C. Brouwer, C. He, *Chem. Rev.* **2008**, 108, 3239; d) S. Suárez-Pantiga, J. M. González, *Pure Appl. Chem.* **2013**, 85, 721.
3. a) A. E. Allen, D. W. MacMillan, *Chem. Sci.* **2012**, 3, 633.
4. a) M. Chiarucci, M. di Lillo, A. Romanuelli, P. G. Cozzi, G. Cera, M. Bandini, *Chem. Sci.* **2012**, 3, 2859; b) C. C. J. Loh, D. Enders, *Chem. Eur. Jour.* **2012**, 18, 10212; c) D.-F. Chen, Z.-Y. Han, X.-L. Zhou, L.-Z. Gong, *Acc. Chem. Res.* **2014**, 47, 2365; d) S. M. Inamdar, A. Konala, N. T. Patil, *Chem. Commun.* **2014**, 50, 15124.
5. a) A. Ballesteros, P. Morán-Poladura, J. M. González, *Chem. Commun.* **2016**, 52, 2905. For related work: b) J. Fernández-Casado, R. Nelson, J. L. Mascareñas, F. López, *Chem. Commun.* **2016**, 52, 2909.