



CPAPHOSAUCL AS NEW CHIRAL BIFUNCTIONAL CATALYSTS TO COMBINE ORGANOCATALYSIS AND AU(I)-CATALYSIS

Mohammed RAMDANI,¹ Xavier GUINCHARD,¹

¹ Institut de Chimie des Substances Naturelles UPR2301, Université Paris-Saclay, CNRS, 1 avenue de la Terrasse, 91198 Gif-sur-Yvette, France
mohammed.ramdani@cnrs.fr

Multicatalysis is an emerging field targeting the formation of complex value products from simple starting materials.¹ The incorporation of different catalytic transformations in one-pot is one of the most powerful and cost-effective tool in organic chemistry, saving time, steps and chemicals/solvents.

Relay catalysis consists in using substrates in the presence of two catalysts in order to form one final product from two distinct catalytic cycles. Relay catalysis is well known in Au(I) catalysis, often by combining Au(I) complexes with chiral phosphoric acids,² including in our group.³ These approaches mostly consists in two distinct catalysts coexisting in the reaction mixture, with potential compatibility / deactivation issues.

Recently, our group described the CPAPhosAuCl as new chiral bifunctional catalysts, used as gold phosphates for applications in enantioselective Au(I) catalysis.⁴ However, these complexes can also be considered and used as chiral organocatalysts to catalyze a first enantioselective reaction and further activated by a silver salt to act as Au(I) complexes that can catalyze a second transformation.

We have designed a multicatalytic sequence combining an enantioselective Pictet-Spengler reaction with a Au(I)-catalyzed cyclization and show that CPAPhosAuCl indeed act as catalysts that enable the catalysis of two different modes of catalysis. We have obtained a series of chiral polycyclic indole derivatives obtained in high yields and enantioselectivities multicatalytic sequences combining both types of catalytic modes. Our main results in the field will be presented.

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