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Preface

Recent developments in gold catalysis

The research carried out during the last decade in the field of homogeneous gold catalysis has put aside the long term erroneous view that gold was 'catalytically dead'. The plethora of new gold-mediated transformations that have been recently reported has indeed highlighted an unsuspected synthetic potential that is intimately associated with the exceptional Lewis acidity of cationic gold species and their ability to selectively activate, under mild conditions, π-systems towards the addition of a wide range of nucleophiles. The ongoing interest of synthetic chemists in this noble metal is reflected by the recent appearance of numerous review articles covering the broad spectrum of applications of gold catalysis in organic synthesis.

The aim of this *Symposium-in-Print* is to highlight the recent developments in gold catalysis through a collection of papers covering various aspect of this exciting field.

These contributions are organized by theme. The first series of papers focuses on intermolecular nucleophilic additions, nucleophilic substitutions and rearrangements. Three articles deal with the hydrofunctionalization of allenes: the group of Widenhoefer reports the formation of allylic alcohols by hydration of allenes, whilst Yamamoto and co-workers present a complete study of the intermolecular reactions of allenes with amines and alcohols. The functionalization of allenes is not limited to the use of heteroatom containing nucleophiles, as exemplified by the contribution of Gagné on the formation of allylarenes. Nucleophilic substitution can also be achieved using gold catalysis. This domain of reactivity is illustrated by the contributions of Campagne and Chan, who, respectively, report the substitution of propargylic alcohols by a wide range of nucleophiles and the allylic alkylation of 1,3-dicarbonyl compounds with allylic alcohols. The rearrangement of propargylic alcohols and their derivatives has also attracted much attention. This area is first represented by the article of Nolan and co-workers who report their investigations of the Meyer–Schuster rearrangement using gold–NHC complexes. The two following papers focus on the use of propargylic esters or phosphonates as substrates for the formation of α-haloenones (Zhang's group) or dienes and naphthalenes (Gevorgyan's group).

The articles collected in the second collection of papers describe transformations leading to the formation of heterocycles and carbocycles by intramolecular nucleophilic addition on alkynes and allenes. An efficient access to polysubstituted furans and dihydrofurans is first reported by the group of Liu. Pale and co-workers describe in the following article a surprising dichotomy between Au(I) and Au(III) for the cyclization of alkynoic acids, whilst our group presents a complete study concerning the formation of dioxolanones from propargylic *tert*-butyl carbonates. Hashmi and co-workers exploit their previously reported gold-catalyzed phenol synthesis in the synthesis of enantiomerically pure tetrahydroisoquinolines, and the group of Krause reports the stereoselective synthesis of a series of natural products possessing an asymmetric tetrahydrofuran ring. The intermolecular formation of C–C bonds is illustrated by the following three articles. Cossy and Meyer present a full account of their investigations concerning the cycloisomerization of 1,6-ene-ynamides, while Michelet and co-workers report an efficient stereoselective carbocyclization/Friedel–Crafts sequence for converting 1,6-enynes into a range of carbo- and heterocycles. The cycloisomerization section is completed by the contribution of Kirsch that describes a sequence of 6-*endo-dig* carbocyclization and subsequent pinacol-type rearrangement for the synthesis of highly substituted 4-acylcyclopentenes. Gold-catalyzed formations of C–C bonds can also be achieved by processes other than the addition of a carbon based nucleophile onto a gold-activated π-system, as exemplified by the work of Pérez and Echavarren on the gold-catalyzed cyclopropanation of olefins with ethyl phenyldiazoacetate.

This *Symposium-in-Print* is concluded by the contributions of Shi and Asao, who, respectively, describe a gold-catalyzed oxidation of benzylic positions to produce ketones and a versatile substitution reaction using *ortho*-alkynylbenzoic acid alkyl esters as alkylating agents.

I finally would like to thank Professor Harry Wasserman for inviting me to act as the Guest Editor of this *Symposium-in-Print* and all the authors who kindly accepted to contribute to this exceptional collection of papers. I am also especially grateful to Guillaume Revol and Yann Obadachian, who applied their artistic skills in the design of the cover illustration and to the Elsevier staff for their precious help during the whole publishing process.

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