Gold Catalysis in the Construction of Molecular Complexity

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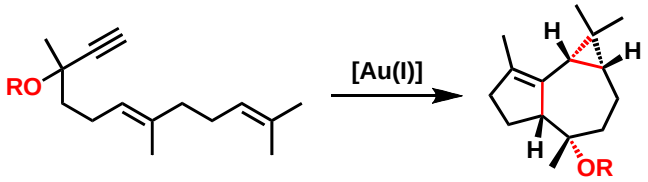
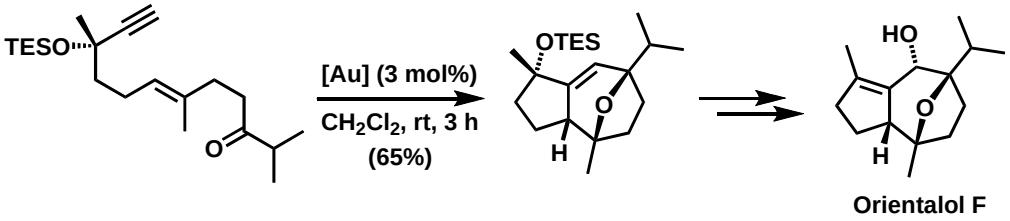
Gold(I) complexes are the catalysts of choice for the cyclization of 1,6-enynes and related substrates under mild conditions.[1] We have found that 1,n-enynes with alkoxy substituents at the propargylic position react with cationic gold catalysts by a new type of intramolecular 1,n-1-migration of OR groups.[2] This reaction leads stereospecifically to tricyclic compounds related to the sesquiterpenes globulol, epiglobulol, and halichonadin F.



Similar substrates with carbonyl groups at the alkenyl chain react by a different pathway to form oxatricyclic compounds. This reaction has been applied for the synthesis of the sesquiterpene orientalol F.[3]



Orientalol F

Related work on the synthesis of englerin A, a natural product that inhibits the growth of renal cancer cell lines at the nanomolar level,[4] and recent fundamental work on the reactions of alkenes with alkynes with gold catalysts will also be presented.

References:

(1) E. Jiménez-Núñez, A. M. Echavarren, *Chem. Rev.* **2008**, *108*, 3326-3350.

(2) E. Jiménez-Núñez, M. Raducan, T. Lauterbach, K. Molawi, C. R. Solorio, A. M. Echavarren, *Angew. Chem. Int. Ed.* **2008**, *48*, 6152-6155.

(3) E. Jiménez-Núñez, K. Molawi, A. M. Echavarren, *Chem. Commun.*. **2009**, 7327-7329.

(4) R. Ratnayake, D. Covell, T. T. Ransom, K. R. Gustafson, J. A. Beutler, *Org. Lett.* **2009**, *11*, 57-60.