World Academy of Science, Engineering and Technology
International Journal of Pharmacological and Pharmaceutical Sciences
Vol:16, No:07, 2022

Gold–M Heterobimetallic Complexes: Synthesis and Initial Reactivity Studies

Authors : Caroline Alice Rouget-Virbel, F. Dean Toste

Abstract : Heterobimetallic systems have been precedented in a wide array of bioinorganic and heterogeneous catalytic settings, in which cooperative bond-breaking and bond-forming events mediated by neighboring metal sites have been proposed but are challenging to study and characterize. Heterodinuclear transition-metal catalysis has recently emerged as a promising strategy to tackle challenging chemical transformations, including C−C and C−X couplings as well as small molecule activation. It has been shown that these reactions can traverse nontraditional mechanisms, reactivities, and selectivities when homo- and heterobimetallic systems are employed. Moreover, stoichiometric studies of transmetallation from gold complexes have demonstrated that R transfer from PPh3–Au(I)R to Cp- and Cp*-ligated group 8/9 complexes is a viable elementary step. With these considerations in mind, we hypothesized that heterobimetallic Au–M complexes could serve as a viable and tunable catalyst platform to explore mechanisms and reactivity. In this work, heterobimetallic complexes containing Au(I) centers tethered to Ir(III) and Rh(III) piano stool moieties were synthesized and characterized. Preliminary application of these complexes to a catalytic allylic arylation reaction demonstrates bimetallic cooperativity relative to their monomeric metal components.

Keywords : heterobimetallic, catalysis, gold, rhodium
Conference Title : ICOSMC 2022 : International Conference on Organic Synthesis and Medicinal Chemistry
Conference Location : Stockholm, Sweden
Conference Dates : July 12-13, 2022