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Heterogeneous Gold(I)-Catalyzed Oxidative Ring Expansion of 2-Alkynyl-1,2-Dihydropyridines or -Quinolines Towards Functionalized Azepines or Benzazepines


Ring Expansion of 2-Alkynyl-1,2-Dihydropyridines with Pyridine N-Oxide on a Silica-Supported Au Complex

Significance: A gold complex immobilized on a mesoporous silica (MCM-41) bearing diphenylphosphine functional groups (MCM-41-Ph2P-AuNTf2) catalyzed the oxidative ring expansion of 2-alkynyl-1,2-dihydropyridines or -quinolines with pyridine N-oxide to give the corresponding azepines in ≤96% isolated yield.

Comment: The authors have previously reported the preparation of MCM-41-Ph2P-AuNTf2 and its use in the hydroamination of alkynes with anilines (Adv. Synth. Catal. 2018, 360, 3940). In the oxidative ring expansion of methyl 2-(phenylethynyl)pyridine-1(2H)-carboxylate with pyridine N-oxide, the catalyst was recovered and reused seven times without significant loss of its catalytic activity (fresh: 96% yield; seventh reuse: 93%).