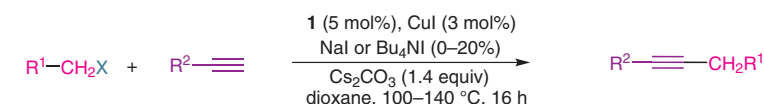


Ni-Catalyzed Sonogashira Coupling of Nonactivated Alkyl Halides

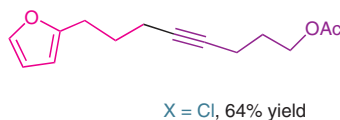
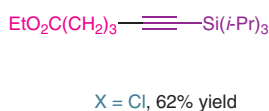
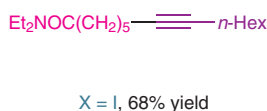
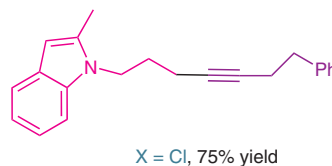
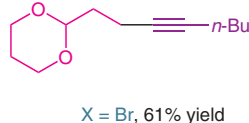
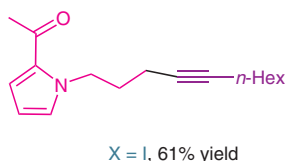
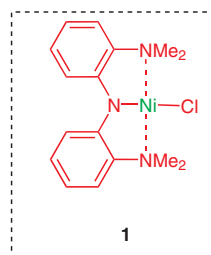
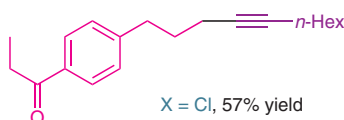
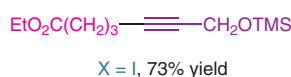


X = Cl, Br, I

R¹ = functionalized Alk, Bn, etc.

R² = functionalized Alk

Examples:



Significance: The Sonogashira cross-coupling of nonactivated, β-H-containing alkyl halides is a highly challenging reaction. Use of nickel(II) pincer complex **1**, developed by the authors, allows for a simple and versatile coupling of functionalized alkyl halides, including chlorides, with various terminal alkynes. This is an excellent method for the preparation of internal alkynes.

Comment: The nickel(II) pincer complex **1** is also a versatile catalyst for the Kumada sp³–sp² coupling (O. Vechorkin, V. Proust, X. L. Hu *J. Am. Chem. Soc.* **2009**, *131*, 9756). Contrary to the classical Sonogashira coupling, aryl halides are not reactive under these conditions. This method is more convenient than the classical alkyne alkylation, which requires harsh basic conditions.