

Nickel-Catalyzed Cross-Coupling Reaction of Acyl Fluorides with Terminal Alkynes

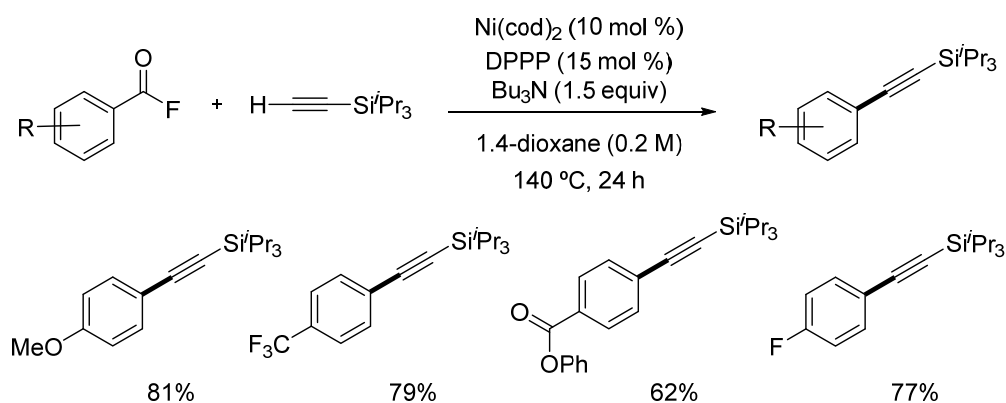
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Keywords: Nickel; Alkynylation Reaction; Acyl Fluorides; Decarbonylation

Sonogashira–Hagihara (S–H) reaction¹ is known to be an effective method for the preparation of a variety of conjugated arylethynes and enynes, and a large number of applications of this reaction have been reported. One of the most important purposes regarding this reaction is to replace the common aryl and vinyl (pseudo)halides with naturally abundant coupling partners. Recently, acyl fluorides have attracted much attention due to their ease of preparation, moderate stability and reactivity in cross-coupling reactions.² We have successfully developed a Pd/Cu-co-catalyzed decarbonylative sila-S–H reaction of acyl fluorides with silylated internal alkynes through direct C–Si bond activation.³ With the aim of further expanding the substrate scope, we have developed the nickel-catalyzed decarbonylative alkynylation using terminal alkynes under copper-free conditions.

The reaction of an array of acyl fluorides with ethynyl(triisopropyl)silane under optimized conditions afforded the desired products in 62–81% yields. Further investigation of the substrate scope revealed that various acyl fluorides bearing ether, fluoride, cyano, ketone, and ester functional groups as well as nitrogen, oxygen, and sulfur-containing heterocyclic compounds were applicable to this reaction.



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