Category

Synthesis of Materials and Unnatural Products

Key words

fluorenones

palladium

C–H activation

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Novel Syntheses of Fluorenones via Nitrile-Directed Palladium-Catalyzed C–H and Dual C–H Bond Activation
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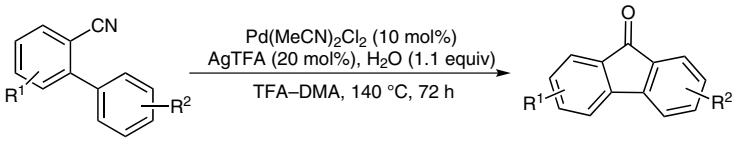
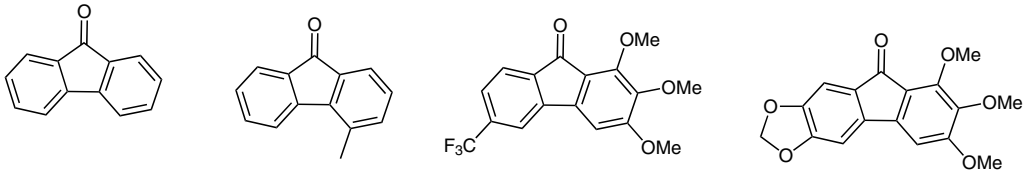
Nitrile-Directed Palladium-Catalyzed Syntheses of Fluorenones

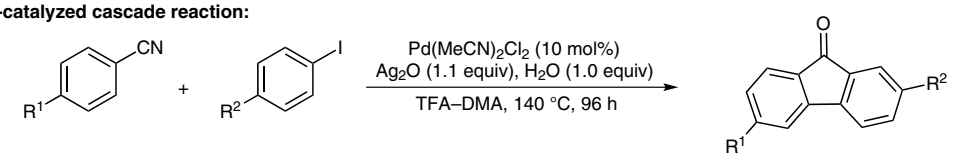


Selected examples:

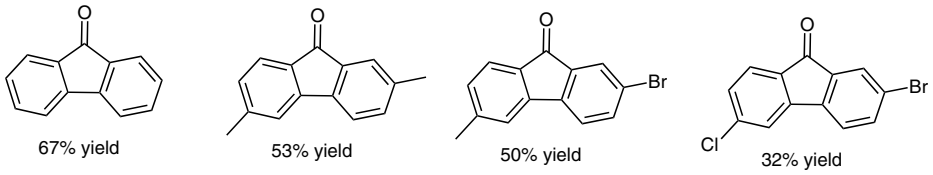


82% yield | 90% yield | 79% yield | 43% yield

Pd-catalyzed cascade reaction:



Selected examples:



67% yield | 53% yield | 50% yield | 32% yield

Significance: Two new synthetic strategies for the palladium-catalyzed synthesis of fluorenones are discussed. Both strategies rely on nitrile-directed C–H bond activation. The first involves C–H activation of a 2-arylbenzonitrile followed by insertion of the nitrile, whereas the second is a dual cascade reaction between a substituted benzonitrile and aryl iodide. Several substituted fluorenones with various substituents were synthesized with both methods.

Comment: In addition to their major results, the authors report the optimization of their catalytic system and discuss the selectivity of fluorenone formation over competing side reactions in certain substrates. Based on additional observations and experiments, a mechanism for the dual C–H activation approach is also proposed. The authors note that they are currently investigating the application of these reported strategies to other chemical transformations and the synthesis of natural products.

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