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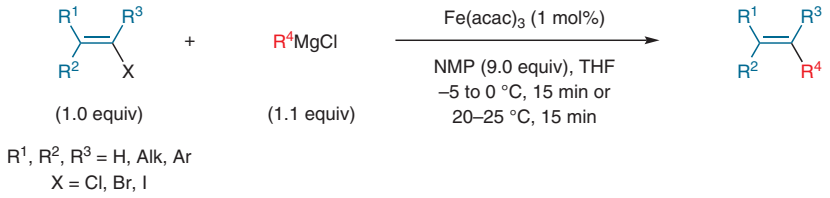
Highly Stereo- and Chemoselective Iron-Catalyzed Alkenylation of Organomagnesium Compounds
Synthesis **1998**, 1199–1205.

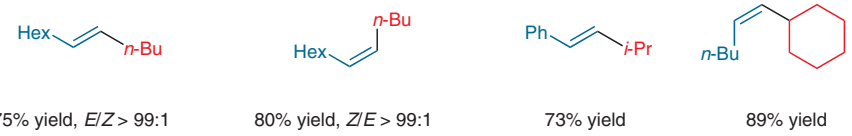
Iron-Catalyzed Alkenylation of Organomagnesium Reagents



(1.0 equiv) (1.1 equiv)

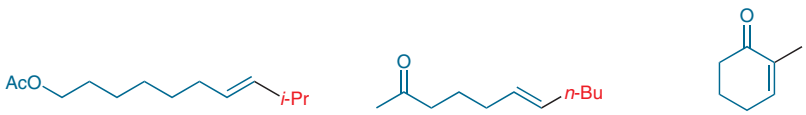
R^1, R^2, R^3 = H, Alk, Ar
X = Cl, Br, I

Selected examples:



75% yield, *E*/*Z* > 99:1 | 80% yield, *Z*/*E* > 99:1 | 73% yield | 89% yield

82% yield | 86% yield | 84% yield | 75% yield



72% yield | 80% yield | 68% yield

79% yield | 79% yield

Significance: In 1998, Cahiez and Avedissian reported a general method for the iron-catalyzed cross-coupling between alkenyl halides (halide = Cl, Br, or I) and Grignard reagents in high yields and excellent diastereoselectivities (>99:1).

Comment: The approach significantly improved the cross-coupling between alkenyl halides and Grignard reagents using $Fe(acac)_3$ as catalyst. Additionally, it was found that the use of a polar co-solvent such as NMP was crucial for the cross-coupling to proceed in excellent yields. Furthermore, functional groups such as ketones were tolerated for the first time in these cross-coupling reactions (see Review below).

Review: C. Bolm, J. Legros, J. Le Paih, L. Zani *Chem. Rev.* **2004**, *104*, 6217–6254.

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Metals in Synthesis

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