Trialkylation of cyclic thioiminium ions

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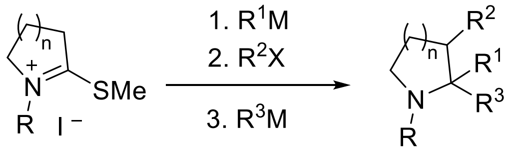
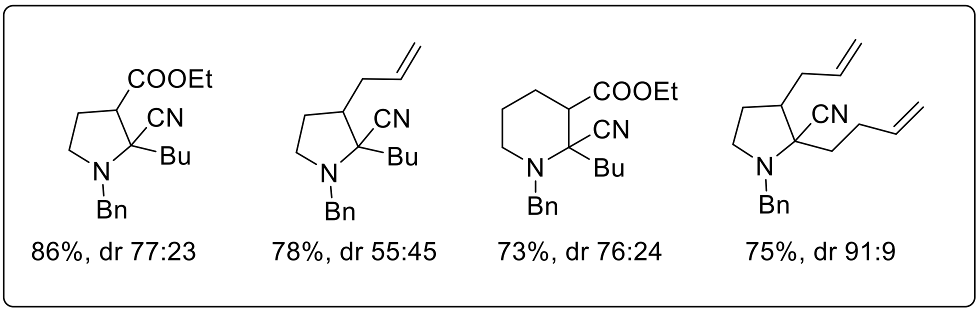
Thioiminium ions are excellent bis-electrophiles for the preparation of symmetrical *gem*-dialkylated cyclic amines. [1] More recently, we have developed the addition of organocopper reagents to thioiminium ions for the functionalization of the α-position of nitrogen atom, a method to prepare non-symmetrical *gem*-dialkylated cyclic amines. [2]

Here, we report an extension of this work, where a cyclic thioiminium ion is converted into trialkylated cyclic amines in a one-pot process via successive treatment with nucleophile (R^1M), an electrophile (R^2X) and a second nucleophile (R^3M). The scope and limitation of this reaction as well as its mechanism will be discussed.





86%, dr 77:23 78%, dr 55:45 73%, dr 76:24 75%, dr 91:9

Our transformation, in which 3 C-C bonds are formed in one single process will be used for the synthesis of alkaloid (±)-isoretronecanol.

[1] A. Agosti, S. Britto, P. Renaud, *Org. Lett.* **2008**, *10*, 1417-1420.
[2] P. Mateo, Ph.D. Thesis, University of Bern (Bern), **2013**.