Fully Substituted α-Aminonitriles as Versatile Intermediates Toward the Synthesis of Alkaloids

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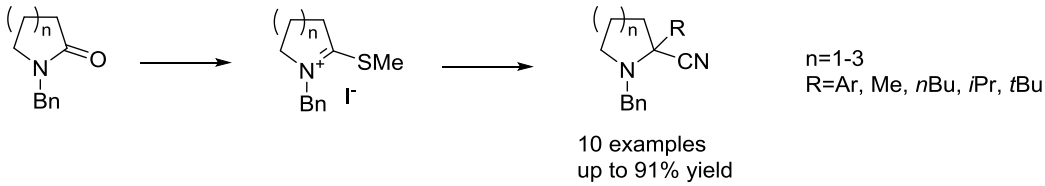
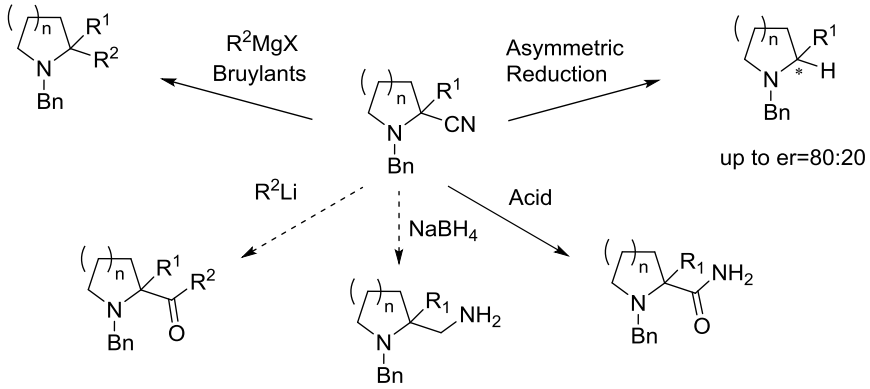
An efficient and robust route toward fully substitued cyclic α-aminonitriles *via* thioiminium ions obtained from cyclic lactams was recently developed in our group. Quaternary α-aminonitriles were obtained in good yields after sequential alkylation-cyanation process.[1]



Nitrile groups are interesting moieties since they can be converted in one step into a variety of other functional groups, including primary amines, ketones, carboxylic acids (or esters), and amides. They are also stable precursors of iminium ions and enamines. Our work focused on the use of those later versatile intermediates and especially their asymmetric reduction.[2] The results are presented herein.



This strategy was successfully applied in the formal total synthesis of (±)-Cephalotaxine *via* the preparation of Tietze' s intermediate.[3]

[1] D. F. Taber; Reddy, P. G.; Arneson, K. O. *J. Org. Chem.* **2008**, *73*, 3467.
[2] J. Wu; Wang, F.; Ma, Y.; Cui, X.; Cun, L.; Zhu, J.; Deng, J.; Yu, B. *Chem. Commun.* **2006**, 1766.
[3] a) L. F. Tietze, H. Schirok, *J. Am. Chem. Soc.* **1999**, *121*, 10264–10269. b) N. Isono, M. Mori, *J. Org. Chem.* **1995**, *60*, 115–119