Glycochimie synthétique pour les Sciences de la Vie : Contrôle de la sélectivité de quelques réactions par des sels de fer

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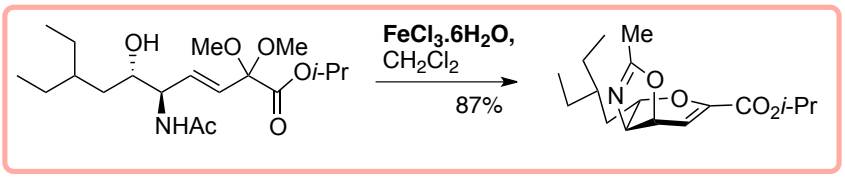
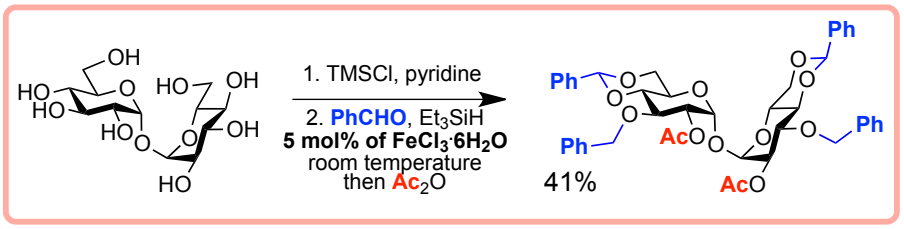
Iron salts have recently attracted considerable attention as inexpensive and environmentally friendly agents in a wide range of selective processes in organic synthesis,[1] and their use as Lewis acid in carbohydrate chemistry is well-documented. We will report a few remarkable transformations induced by iron (III) salts as a Lewis acid either under stoechiometric or catalytic conditions. The results are very concise preparations of important glyco-constructs.

In connection with ongoing work at the interface of chemistry and biology, we will present:

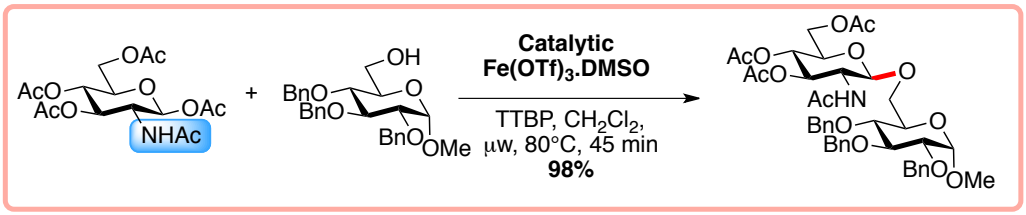
- an unprecedented a one-pot cascade of transformations induced by iron(III)-chloride hexahydrate, including acetal removal / C-C double bond isomerization / cyclization to a dihydropyran / oxazoline formation on chiral substrates derived from the three-component borono-Mannich Petasis reaction.[2]



- a regioselective one-pot protection of carbohydrates, optimized on D-glucopyranosides, by using stable iron(III) chloride hexahydrate a single catalyst in a single reaction vessel.[3] Different building blocks, displaying different protecting group patterns are obtained in a single flask by fine-tuning the reaction conditions. This approach circumvents the necessity of carrying out the time-consuming isolation and purification of intermediates.



- the use of catalytic amounts of Fe(III) triflate.solvate for the efficient activation of the readily available the β-penta acetate of *N*-acetyl glucosamine in the direct and highly selective synthesis of the important GlcNAc β-glycoside motifs.[4]



[1] Selected reviews: (a) C. Bolm, J. Legros, J. Le Paih, L. Zani, *Chem. Rev.* **2004**, *104*, 6217; (b) D. Diaz, P. Miranda, J. Padrón, V. Martín, *Curr. Org. Chem.* **2006**, *10*, 457; (c) D. Sherry, A. Fürstner, *Acc. Chem. Res.* **2008**, *41*, 1500; (d) E. B. Bauer, *Curr. Org. Chem.*, **2008**, *12*, 1341.

[2] J.-F. Soulé, A. Mathieu, S. Norsikian, J.-M. Beau, *Org. Lett.* **2010**, *12*, 5322-5325.

[3] Y. Bourdreux, A. Lemétais, D. Urban, J.-M. Beau, *Chem. Comm.* **2011**, *47*, 2146-2148.

[4] A. Stévenin, F.-D. Boyer, J.-M. Beau, *Eur. J. Org. Chem.* **2012**, 1699-1702.