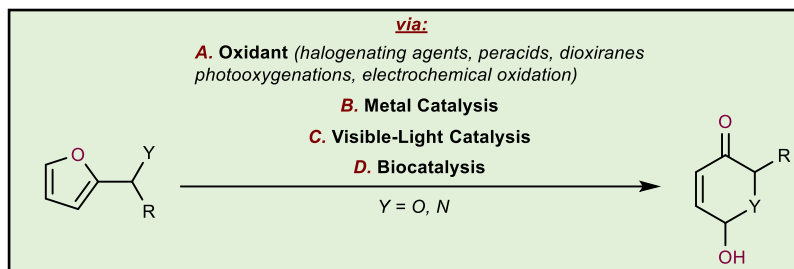


The Achmatowicz Reaction – A General Overview



- Reaction is named after Osman Achmatowicz Jr., a Polish chemist who is credited with the first publication of this methodology in 1971.
- Despite the original report placing a heavy emphasis on utility in monosaccharide synthesis, the reaction sees utility as an elegant method of forming dihydropyrans which can be further functionalized.

Achmatowicz, O. *Tetrahedron*. **1971**, 27, 1973-1996. doi:10.1016/S0040-4020(01)98229-8

Terzis, A. *J. Org. Chem.* **1982**, 47, 3054. https://pubs.acs.org/doi/pdf/10.1021/jo00137a005

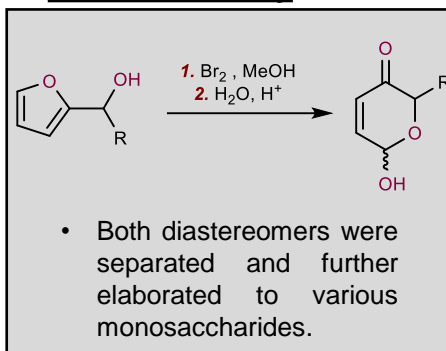
Lee, G. *J. Org. Chem.* **1991**, 56, 25, 7007-7014. https://doi.org/10.1021/jo00025a012

Dimitris, N. *Green Chem.*, **2012**, 14, 601. https://pubs.rsc.org/en/content/articlepdf/2012/gc/c2gc16397g

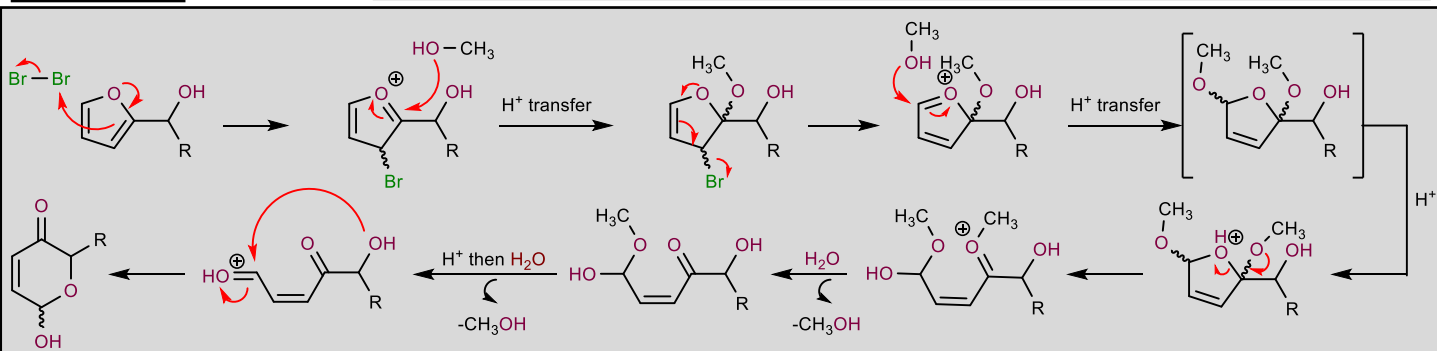
Yining, J. *J. Org. Chem.* **2015**, 80, 3, 1696-702. https://pubs.acs.org/doi/pdf/10.1021/jo502641d

Plutschack, M. *Org. Lett.* **2017**, 19, 1, 30-33. https://doi.org/10.1021/acs.orglett.6b03237

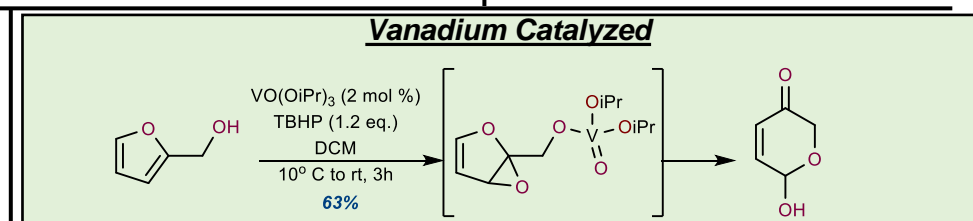
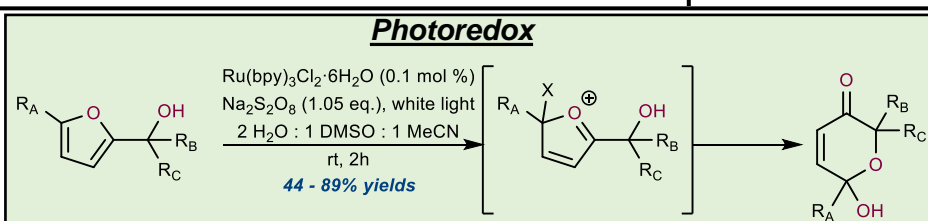
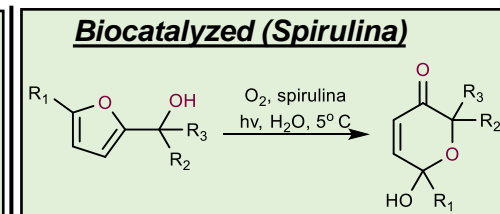
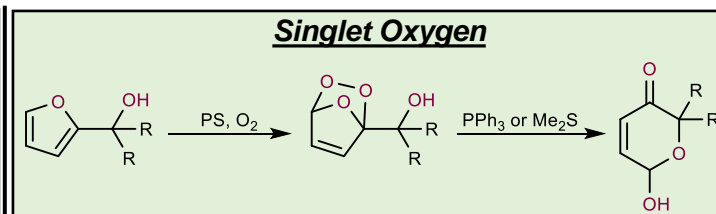
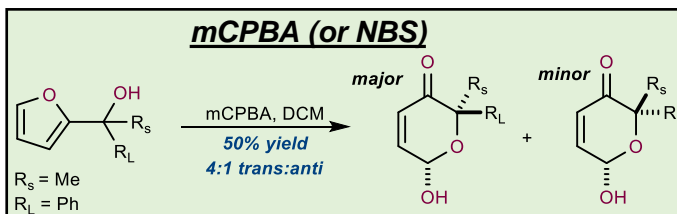
Initial Discovery



Mechanism

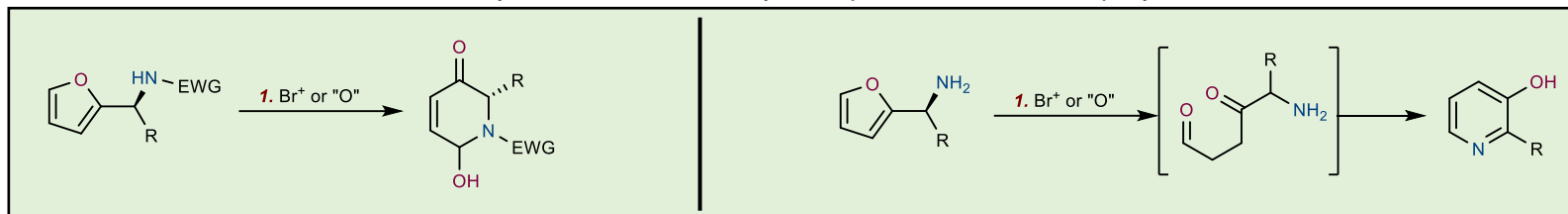


Variations in Conditions



The Aza-Achmatowicz Reaction

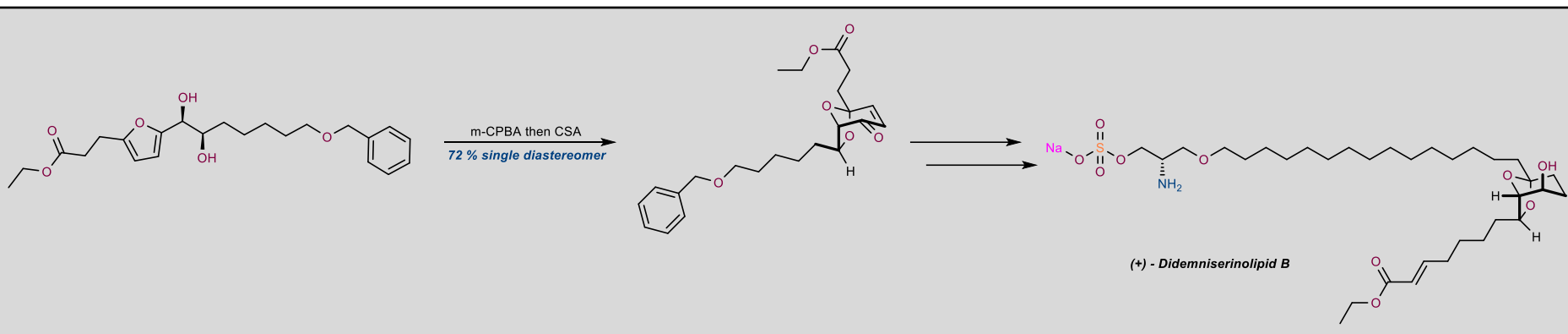
EWG is necessary on the amine or the cyclized product formed will rapidly aromatize



van der Pijl, F. *Eur. J. Org. Chem.*, **2015**, 4811-4829. <https://pubs.rsc.org/en/content/articlelanding/2016/ra/c6ra22611f#cit8>

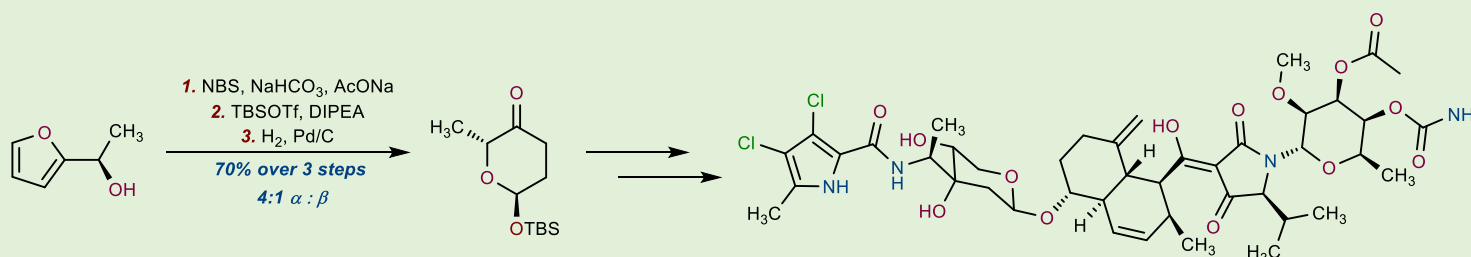
Examples in Total Synthesis

Total Synthesis of (+) - Didemniserinolipid B



Ren, J. *J. Org. Chem.* **2014**, 79, 15, 6987–6995. <https://doi.org/10.1021/jo501142q>

Total Synthesis of Amycolamicin and Kibdelomycin



Yang, S. *J. Am. Chem. Soc.* **2021**, 143, 50, 21258–21263. <https://doi.org/10.1021/jacs.1c11477>