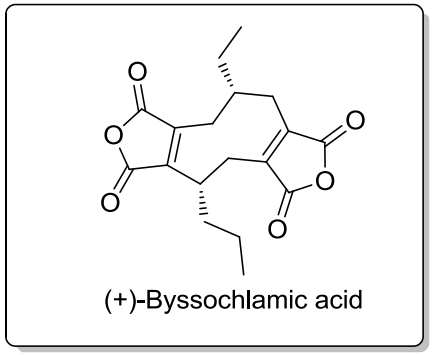
Denksport



Byssochlamic acid

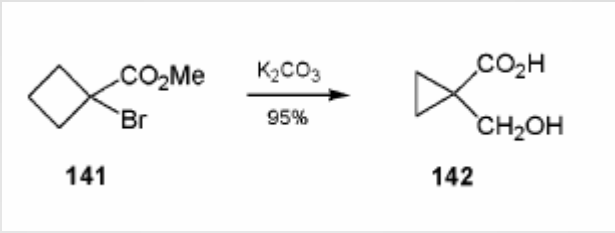
Jean-Baptiste Farcet
June 24th, 2010

Cyclobutane Ring

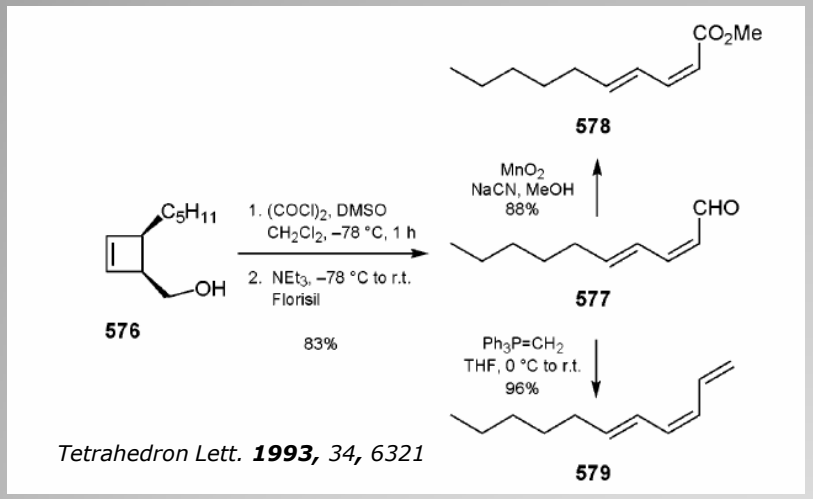
- Inherent ring-strained ←→ cleavage of cyclobutane ring
- Ring contraction
- Ring opening
- Ring expansion

Chem. Rev. ***2003***, *103*, 1485-1537

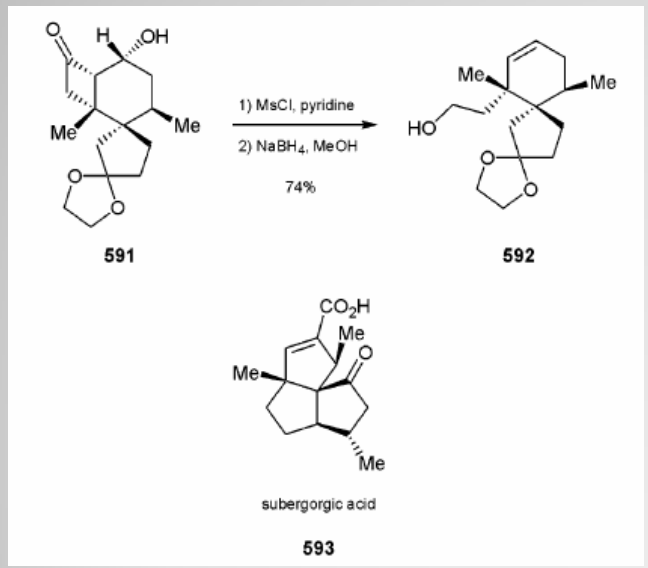
Ring contraction reactions



Transformations of Cyclobutane Derivatives in Natural Product Syntheses



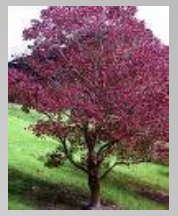
Tetrahedron Lett. ***1993,*** *34,* *6321*



Iwata, C. *et al. J. Org. Chem.* **1988**, *53,* 1623

Thermal electrocyclic ring opening
→ Industrial fragrance **579**
→ Tree beetle *Pityogenes chalcographus* pheromone **578**

Pityogenes chalcographus

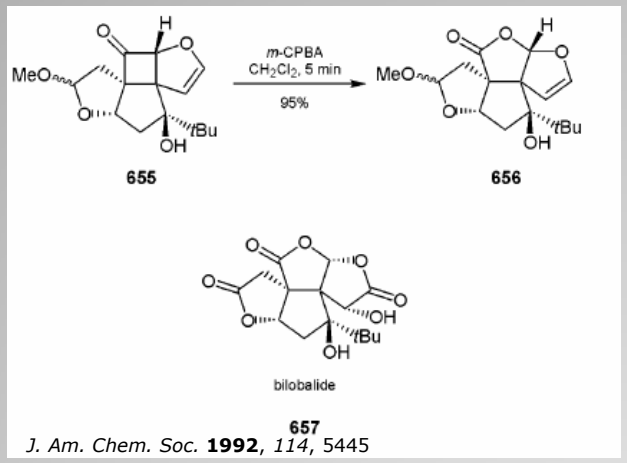


Chinese tallow tree

Reductive ring opening
→Access to subergorgic acid (**593)**
→A neuromuscular inhibitor

Subergorgia suberosa

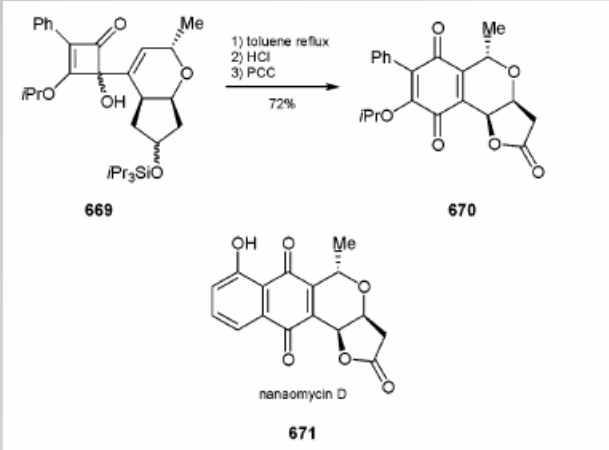
Ring opening reactions



J. Am. Chem. Soc. **1992**, *114*, 5445

Baeyer-Villiger oxidation of the cyclobutane
→ $GABA_A$ receptor inhibitor (**657**)

Ginkgo leaves



J. Org. Chem. **1994**,*59, 7572*

Thermolysis
→ antifungal + antibacterial activity (**671**)

Ring expansion reactions

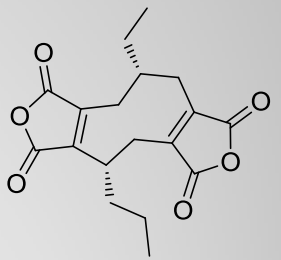
Byssochlamic acid

Isolated from *Byssochlamys fulva*

Charaterised in 1933 (Raistrick *et al.*)

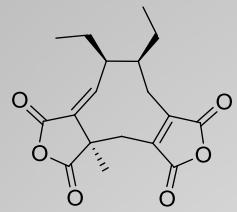
First total Synthesis G. Stork (1972)

First enantiospecific total Synthesis J. White (2000)



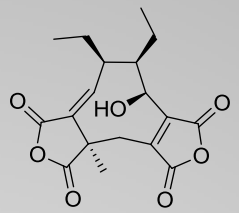
(+/-) Byssochlamic acid

- Nine-membered carboxilic ring
- Two five-membered anhydride/lactol
- A pair of n-alkyl chain
- In some cases: one or more hydroxy groups



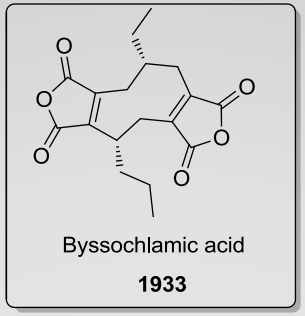
glaucanic acid

1931



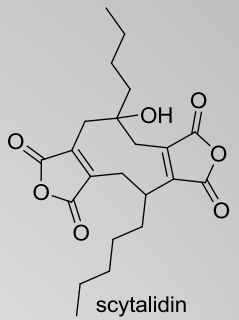
glauconic acid

1931



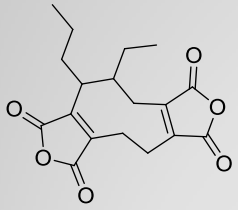
Byssochlamic acid

1933



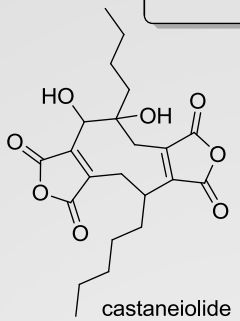
scytalidin

1973



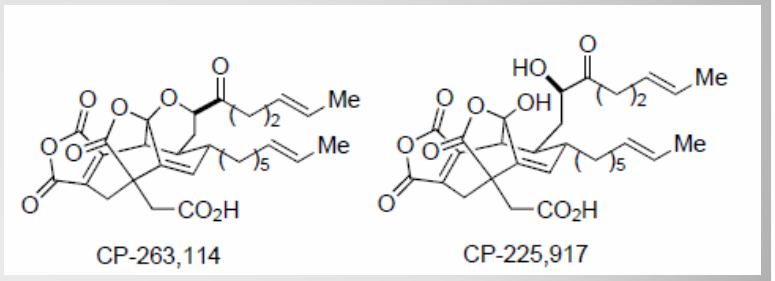
heveadride

1973



castaneiolide

1989



CP-263,114 CP-225,917

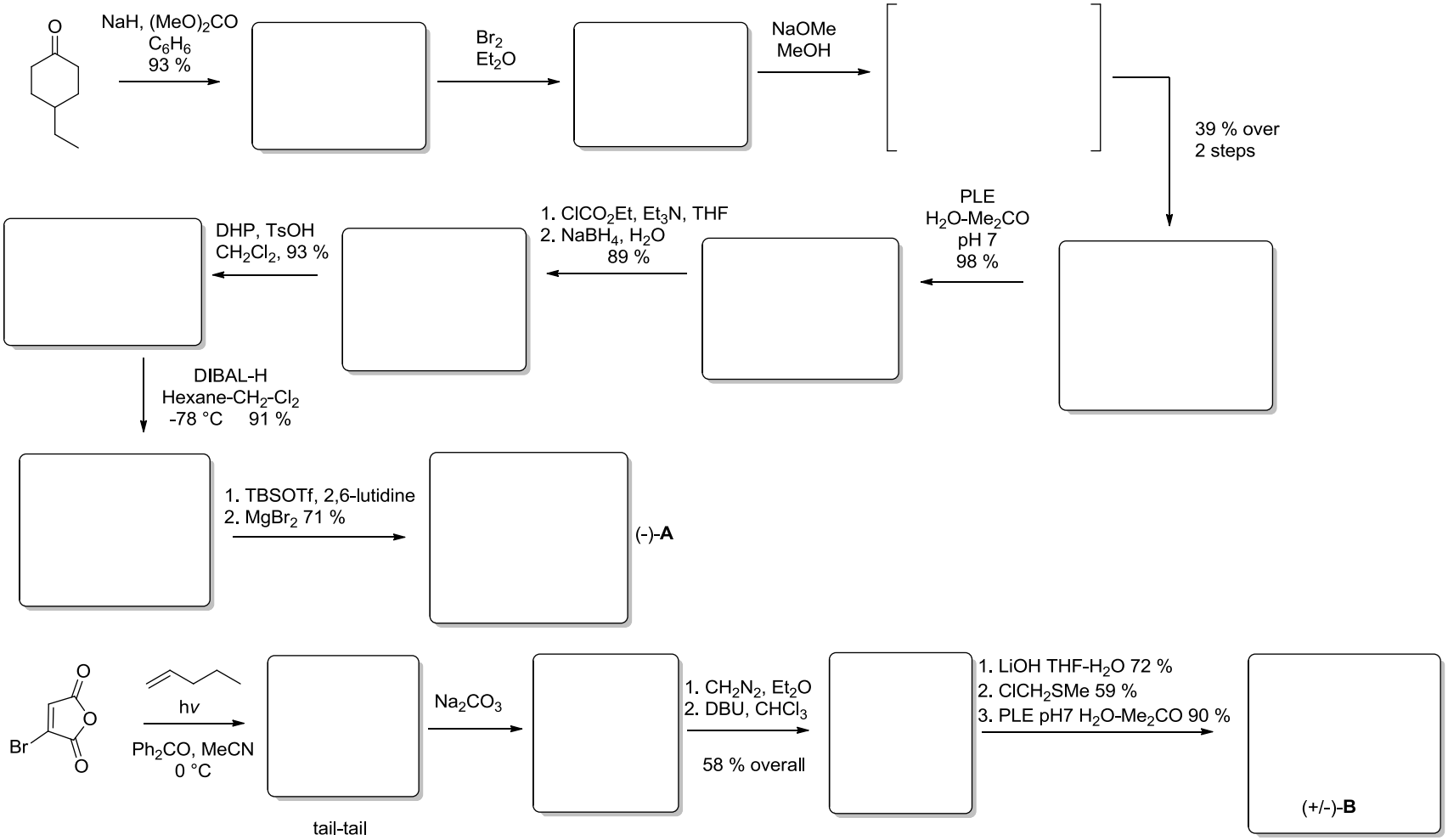
1997

The Nonadride Family

Denksport

24th June 2010

Jean-Baptiste Farcet



J. D. White *et al. Journal of the American Chemical Society* **2000**, *122*, 8665-8671

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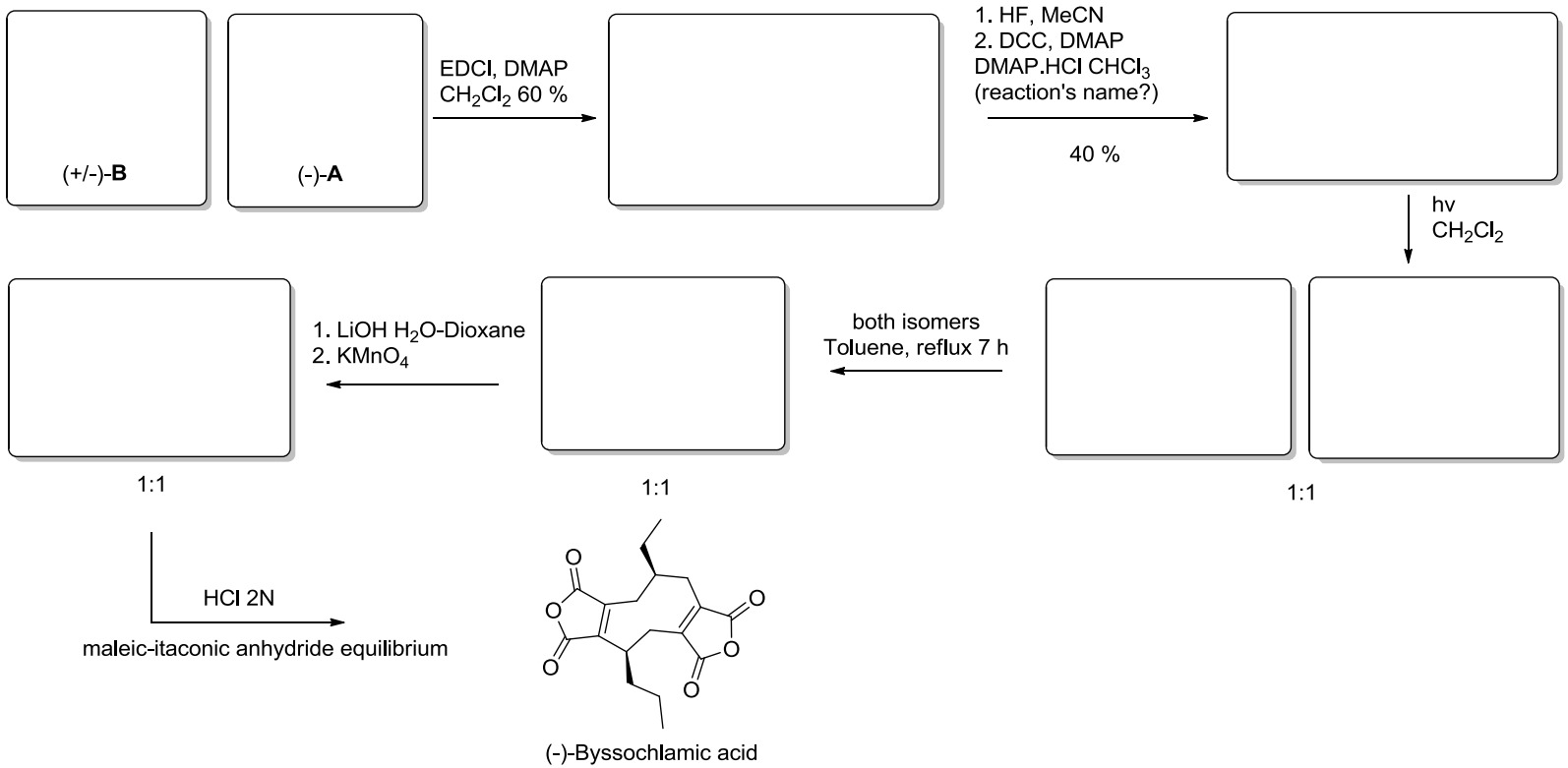
Jean-Baptiste Farcet



J. D. White *et al. Journal of the American Chemical Society* **2000**, *122*, 8665-8671

Bonus

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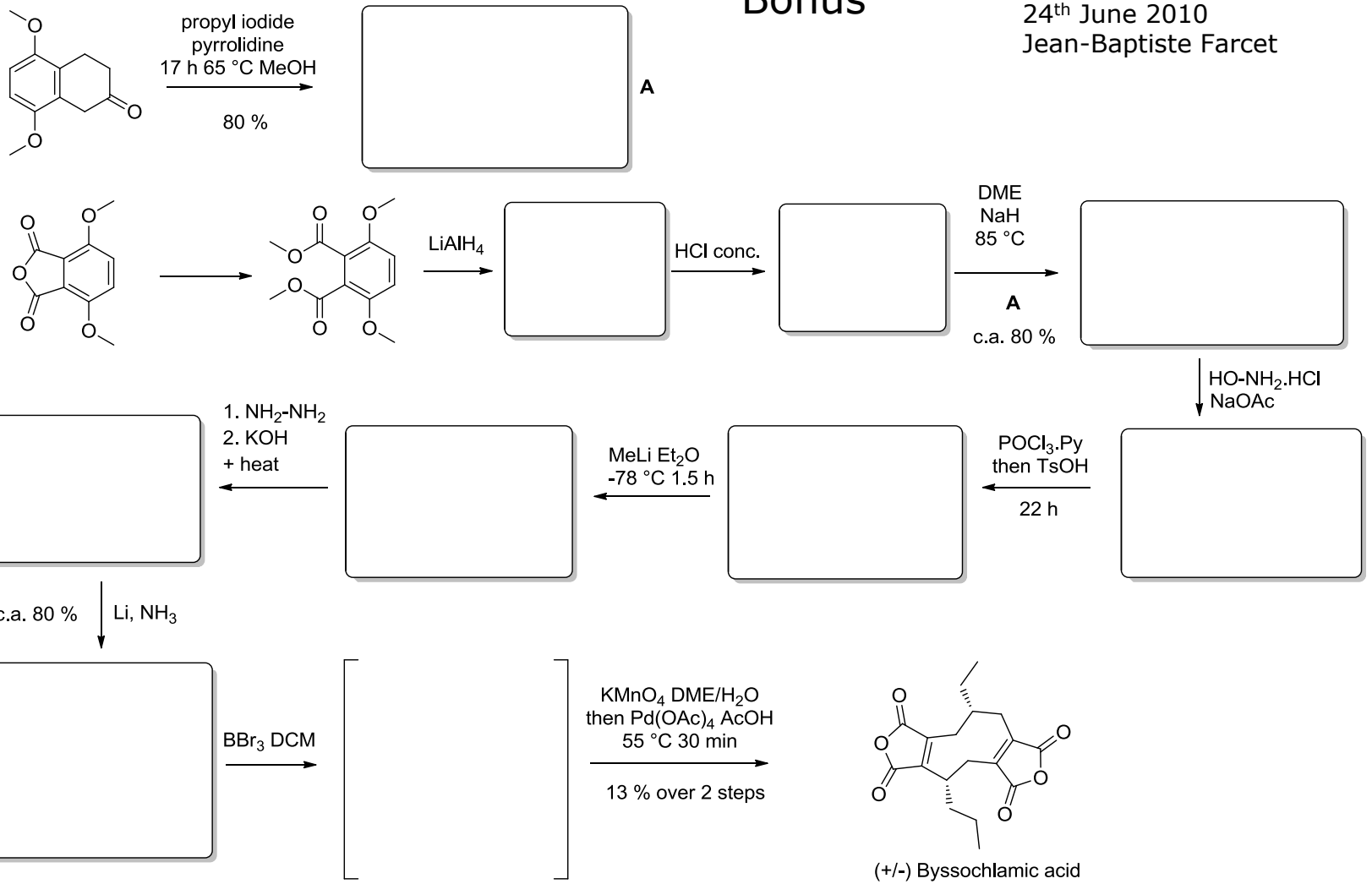
24th June 2010
Jean-Baptiste Farcet



G. Stork *et al. Journal of the American Chemical Society* **1972**, *94*, 4735.