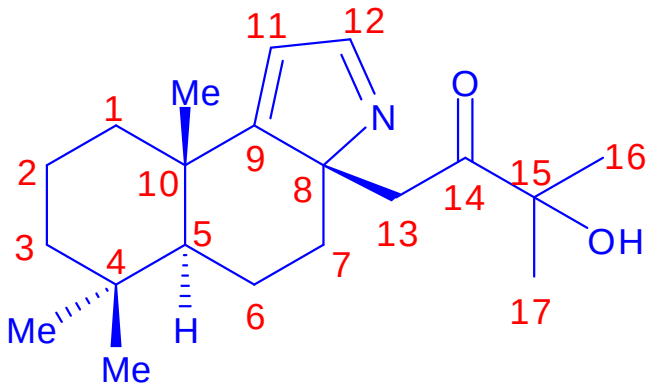
Total Synthesis of (-)-Chamobtusin A



Org. Lett. **2010**, *12*, 4709-4711

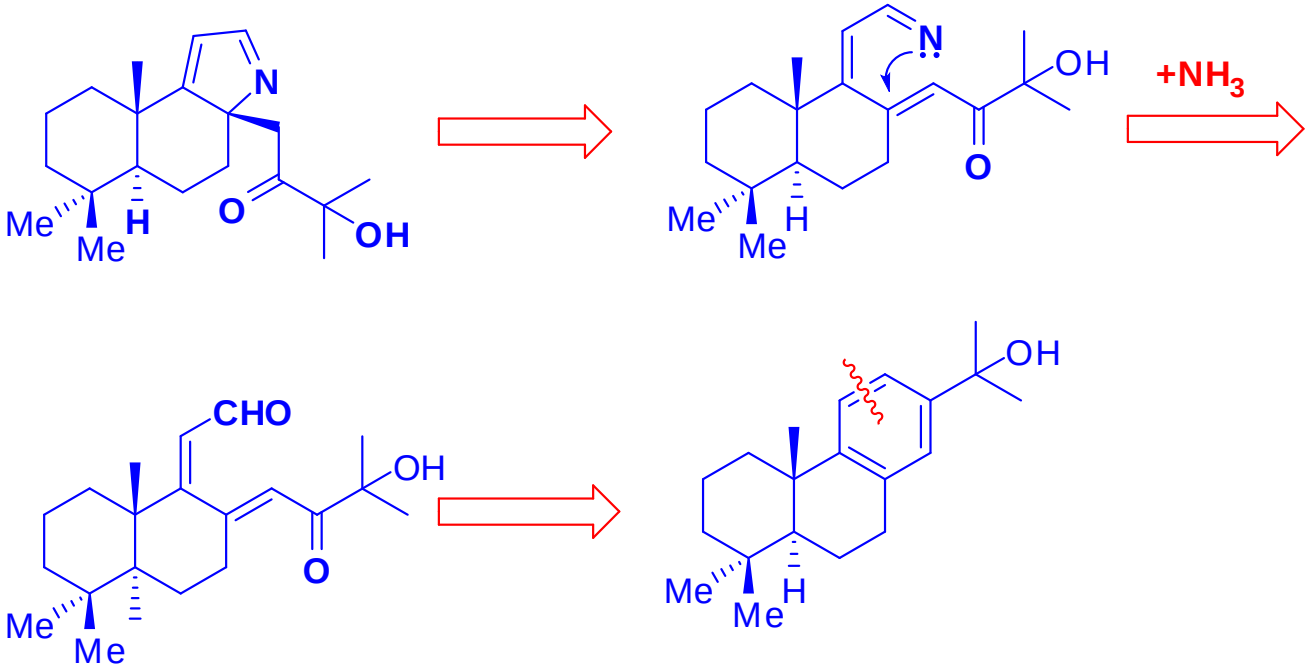
Introduction

- Isolated from *Chamaecyparis obtusa cv. tetragon* in 2007 by Tan and co-workers.

- It is a diterpene
- Structure was established mainly on the basis of 2D NMR
- Confirmed by single-crystal X-ray diffraction analysis

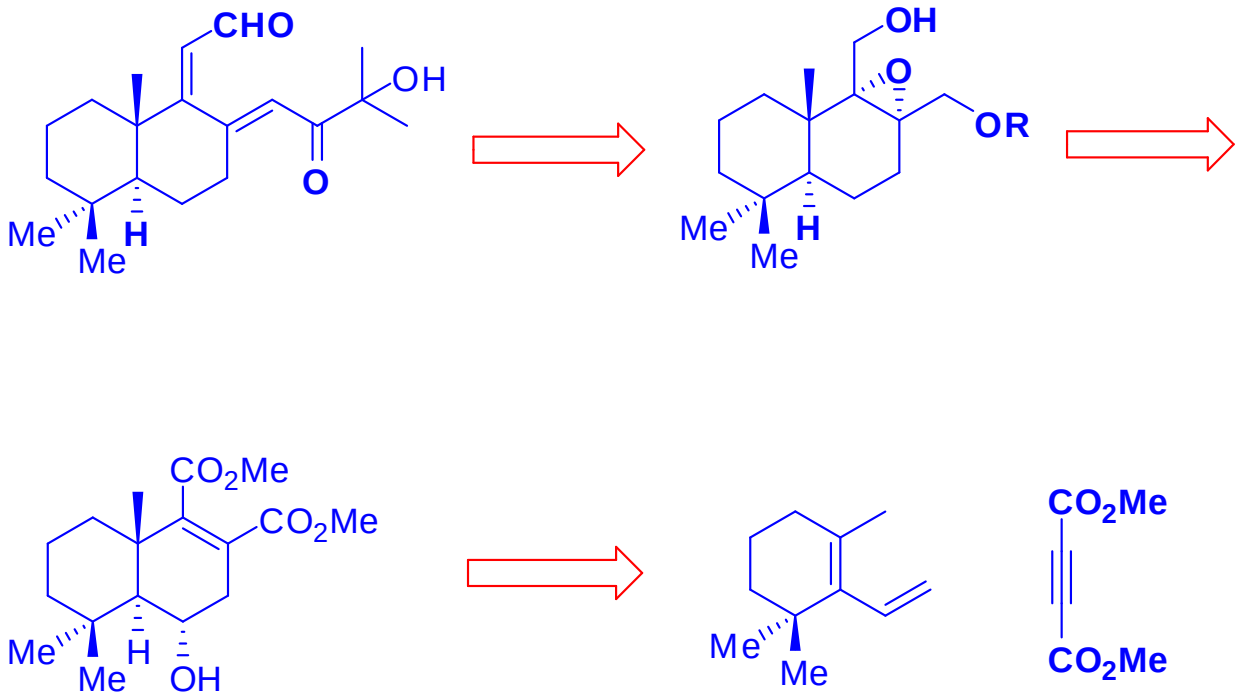
Watanabe's approach for the total synthesis of chamobtusin A

Presumed biosynthesis:



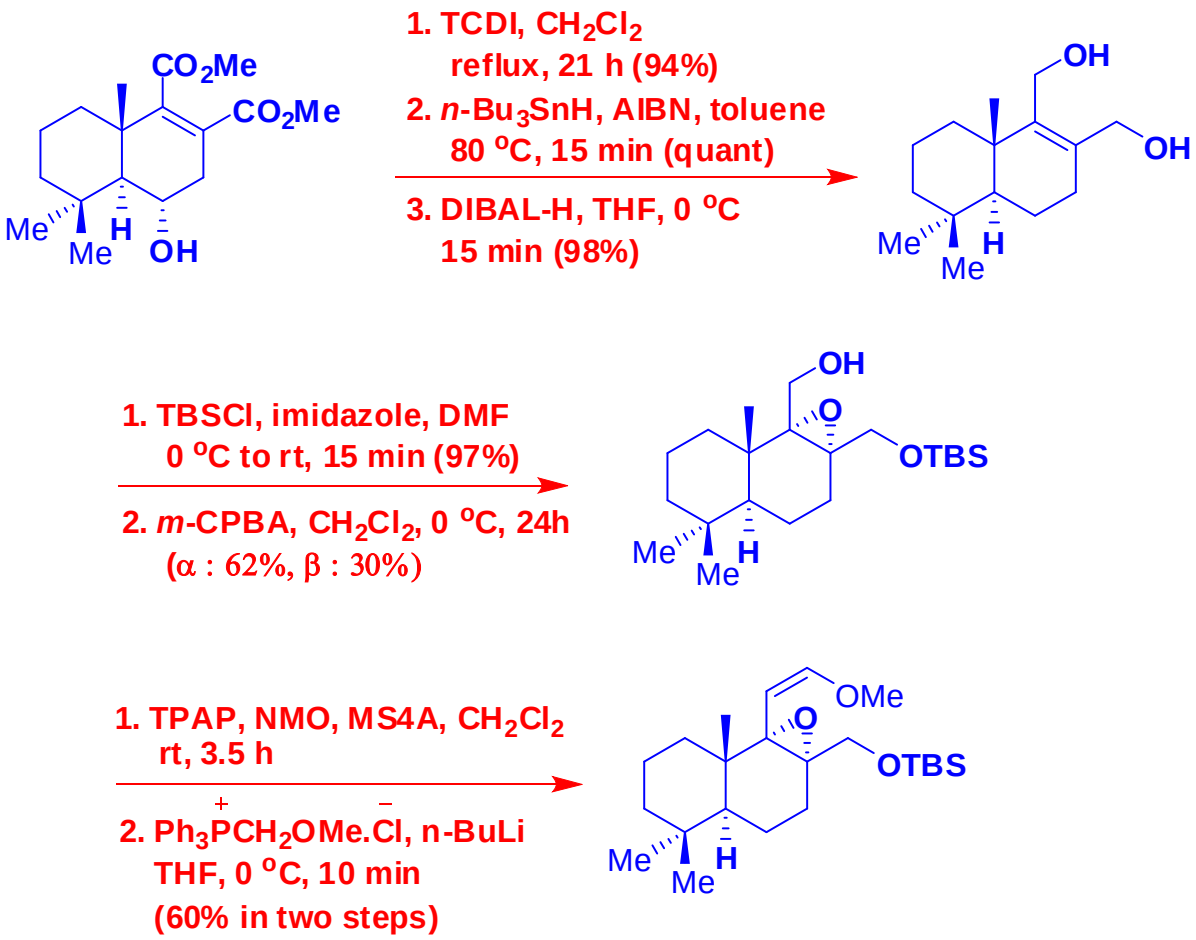
Org. Lett. **2010**, *12*, 4709-4711

Retrosynthetic analysis:



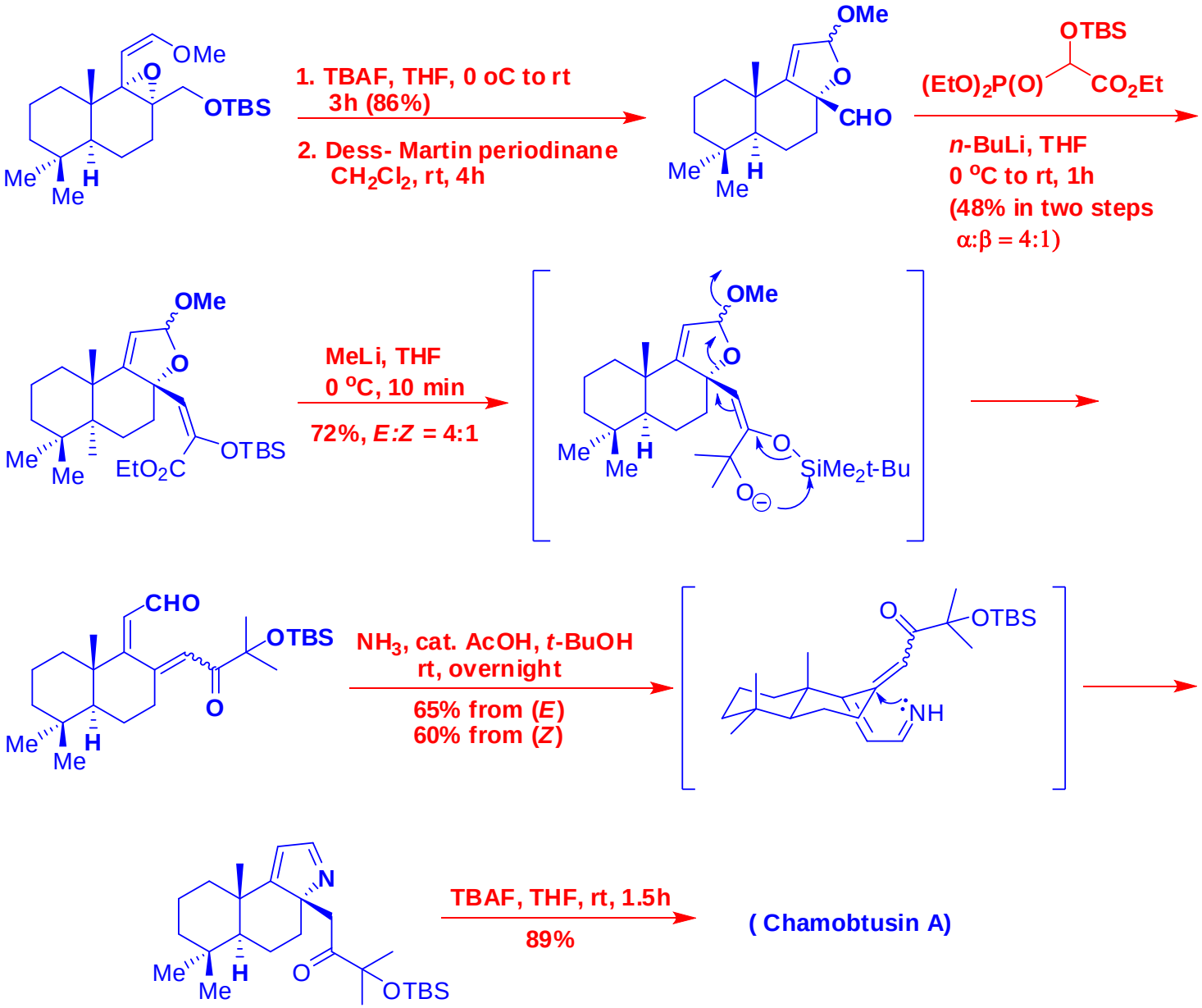
Org. Lett. **2010**, *12*, 4709-4711

First stage of the synthesis:



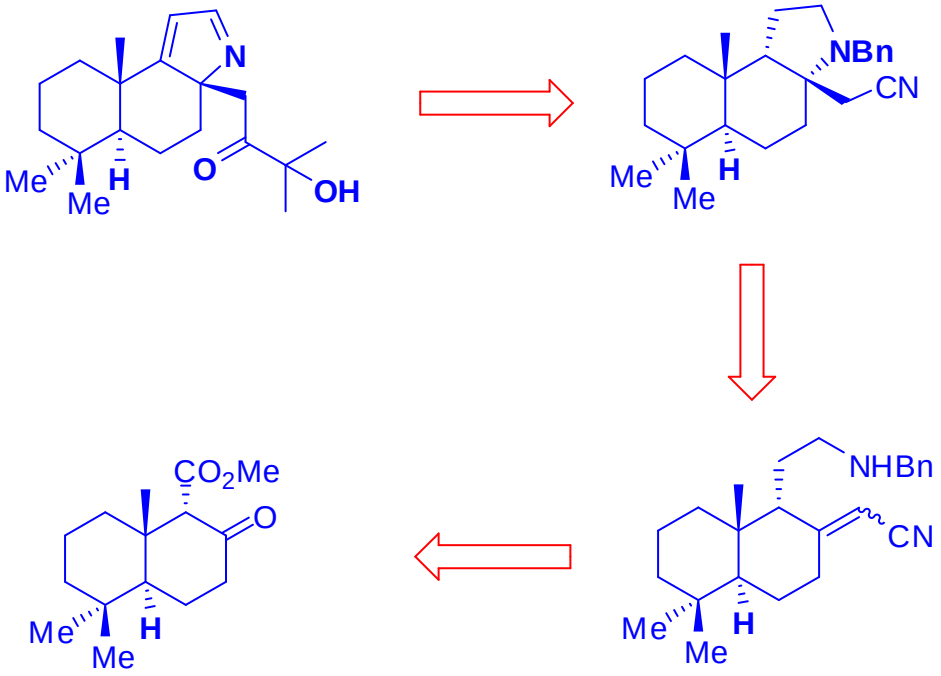
Org. Lett. **2010**, *12*, 4709-4711

Completion of the synthesis:



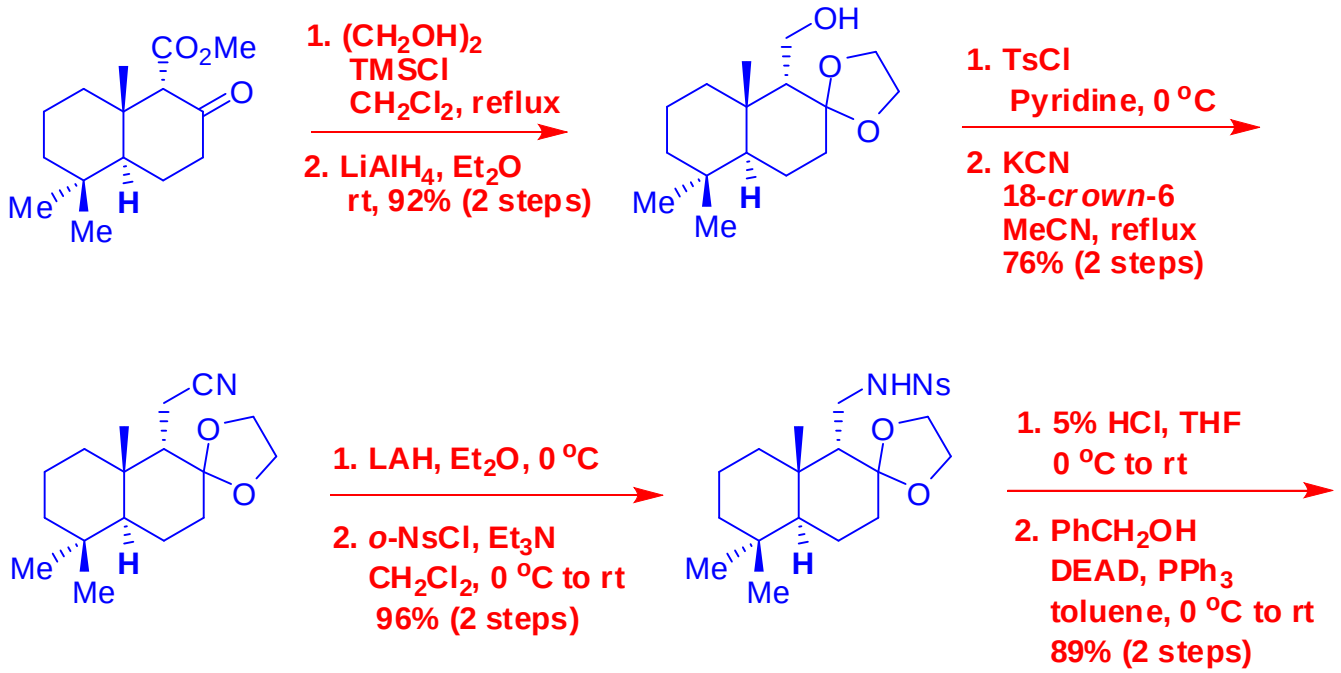
Aoyagi's strategy for the total synthesis of chamobtusin A

Retrosynthetic Analysis:

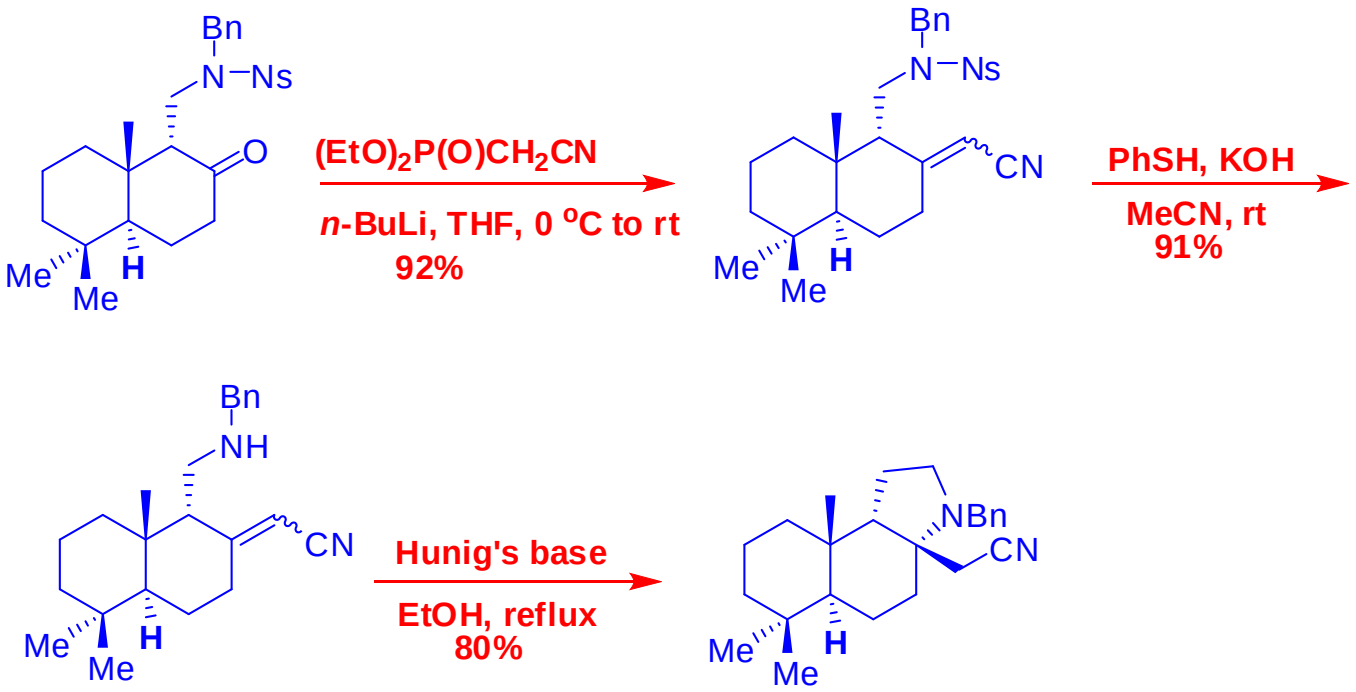


Chem. Commun. **2011**, *47*, 7878-7879

Synthesis of perhydrobenzoindole:

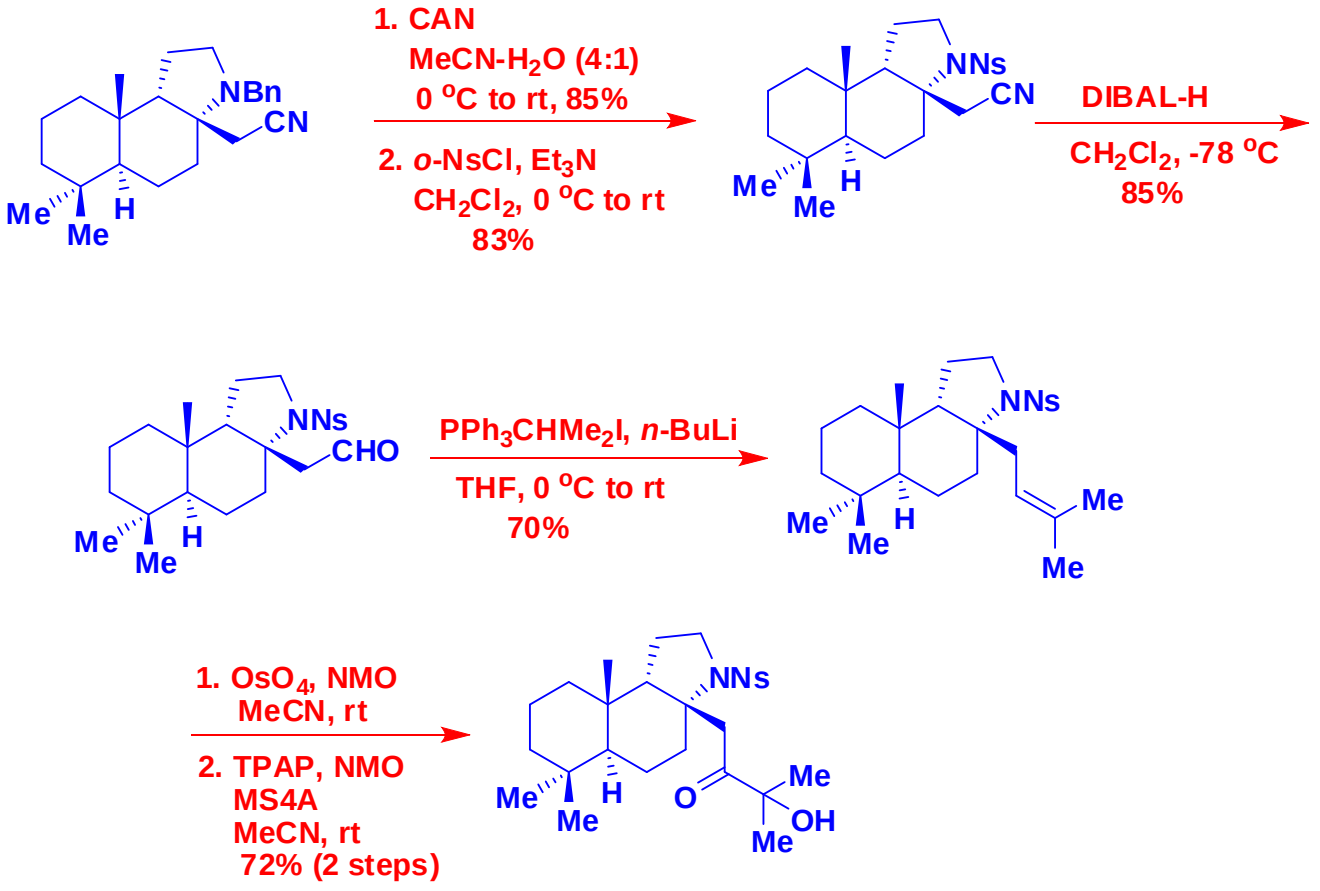


Chem. Commun. **2011**, *47*, 7878-7879



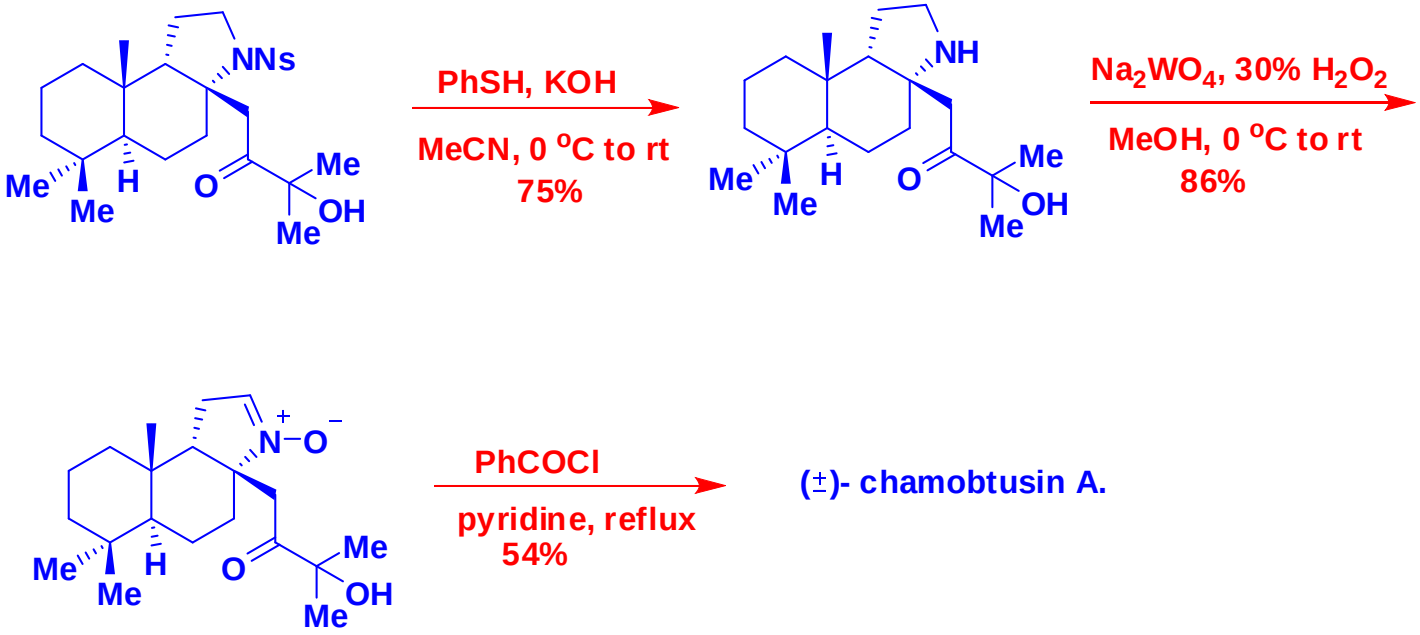
Chem. Commun. **2011**, *47*, 7878-7879

Construction of the C-8 side chain:



Chem. Commun. **2011**, *47*, 7878-7879

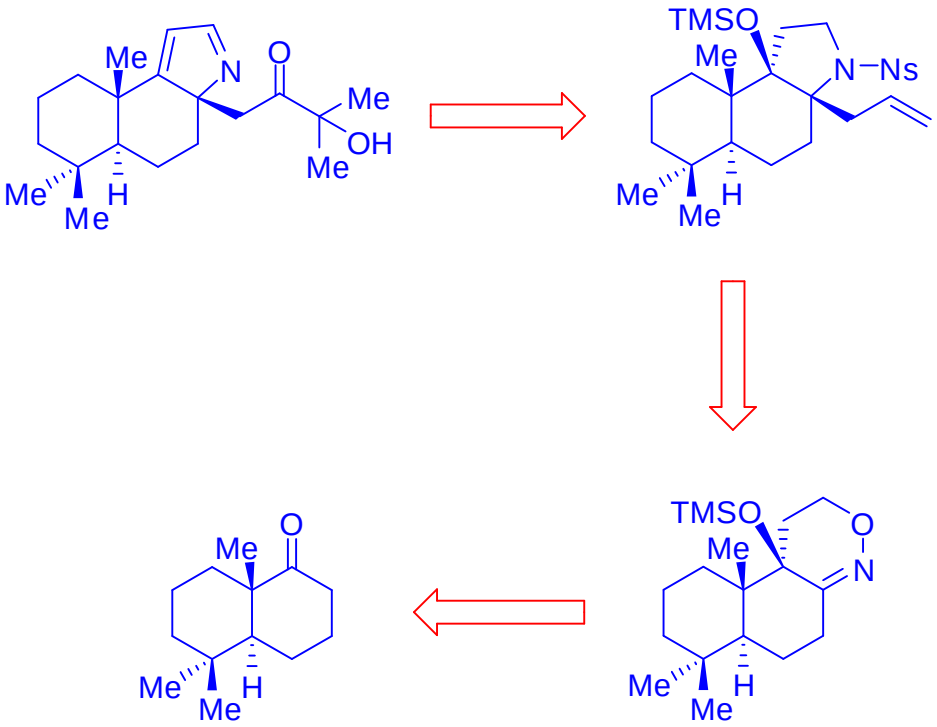
Synthesis of chamobtusin



Chem. Commun. **2011**, *47*, 7878-7879

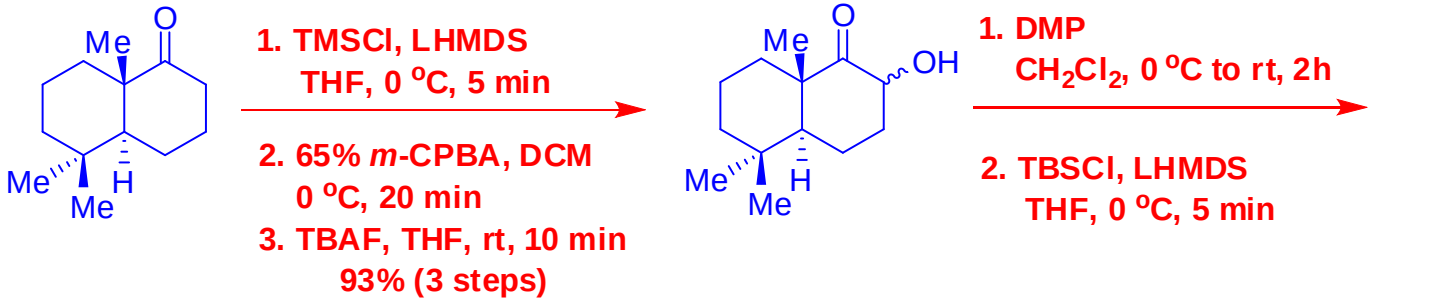
Aoyagi's strategy for the total synthesis of (-)- chamobtusin A

Retrosynthetic Analysis for Chamobtusin A

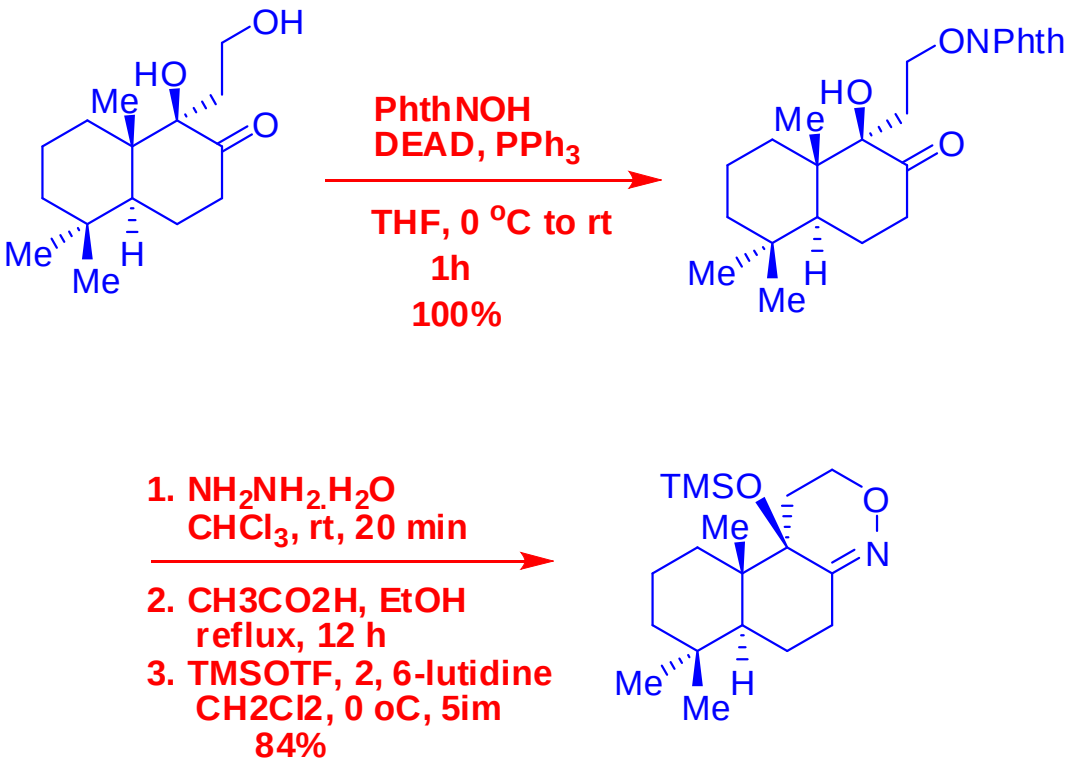


Org. Lett. **2012**, *14*, 6374-6376

Preparation of 1,2-Oxazine

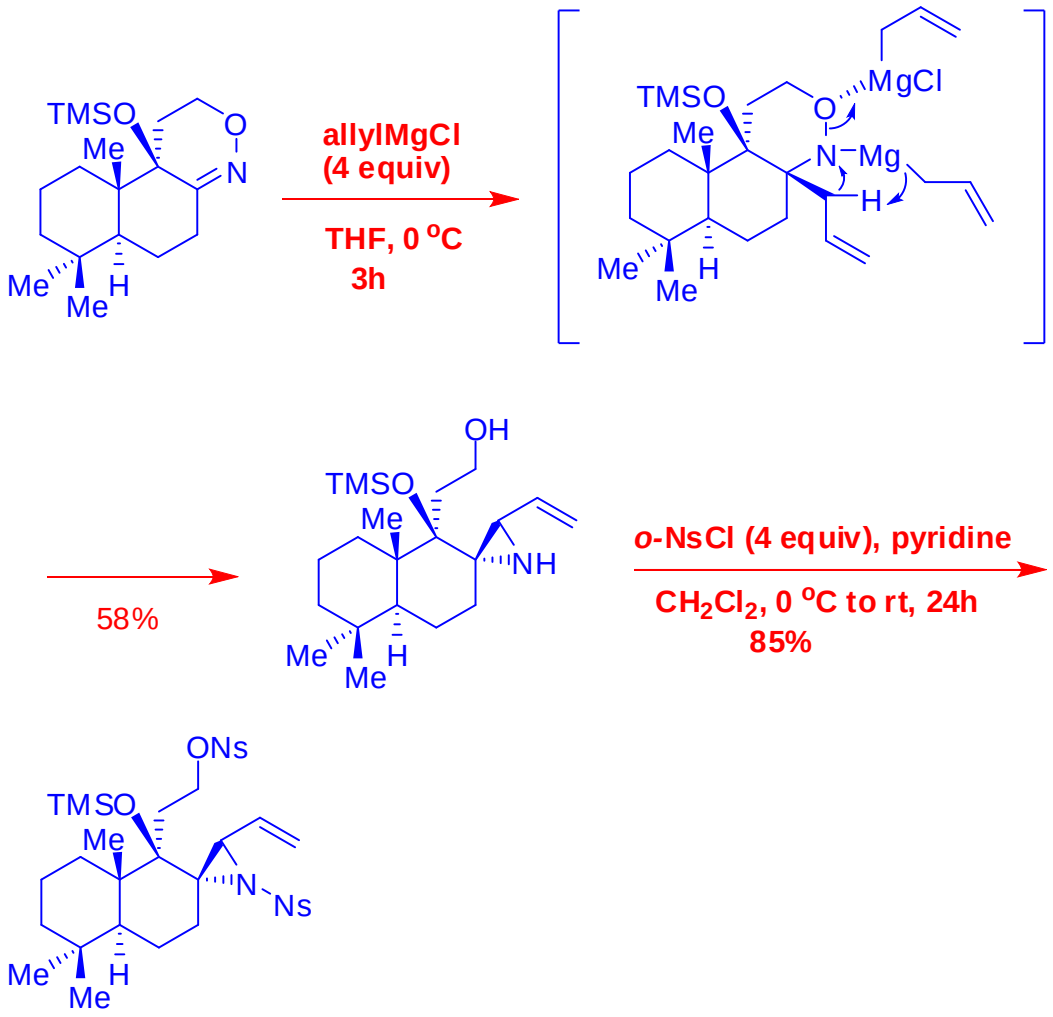


Org. Lett. **2012**, *14*, 6374-6376



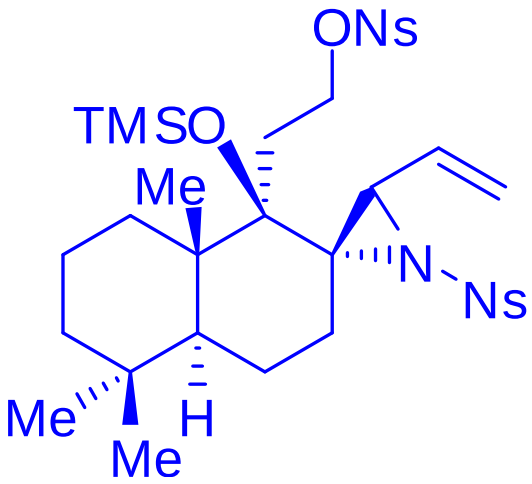
Org. Lett. **2012**, *14*, 6374-6376

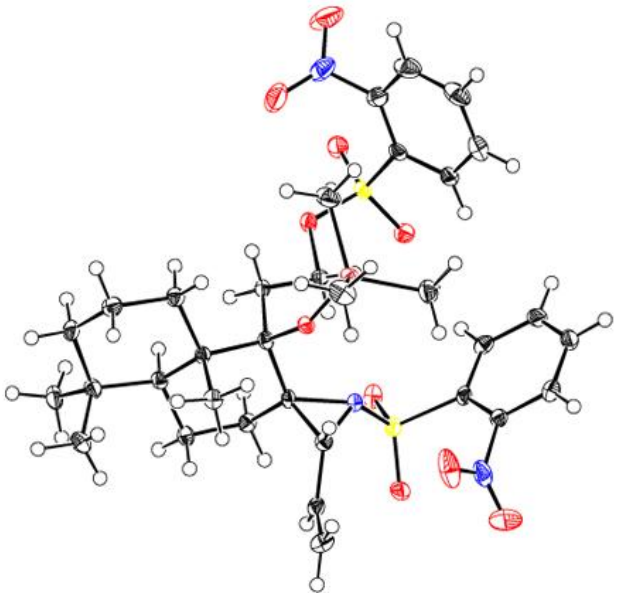
Formation of Vinylaziridine Derivative



Org. Lett. **2012**, *14*, 6374-6376

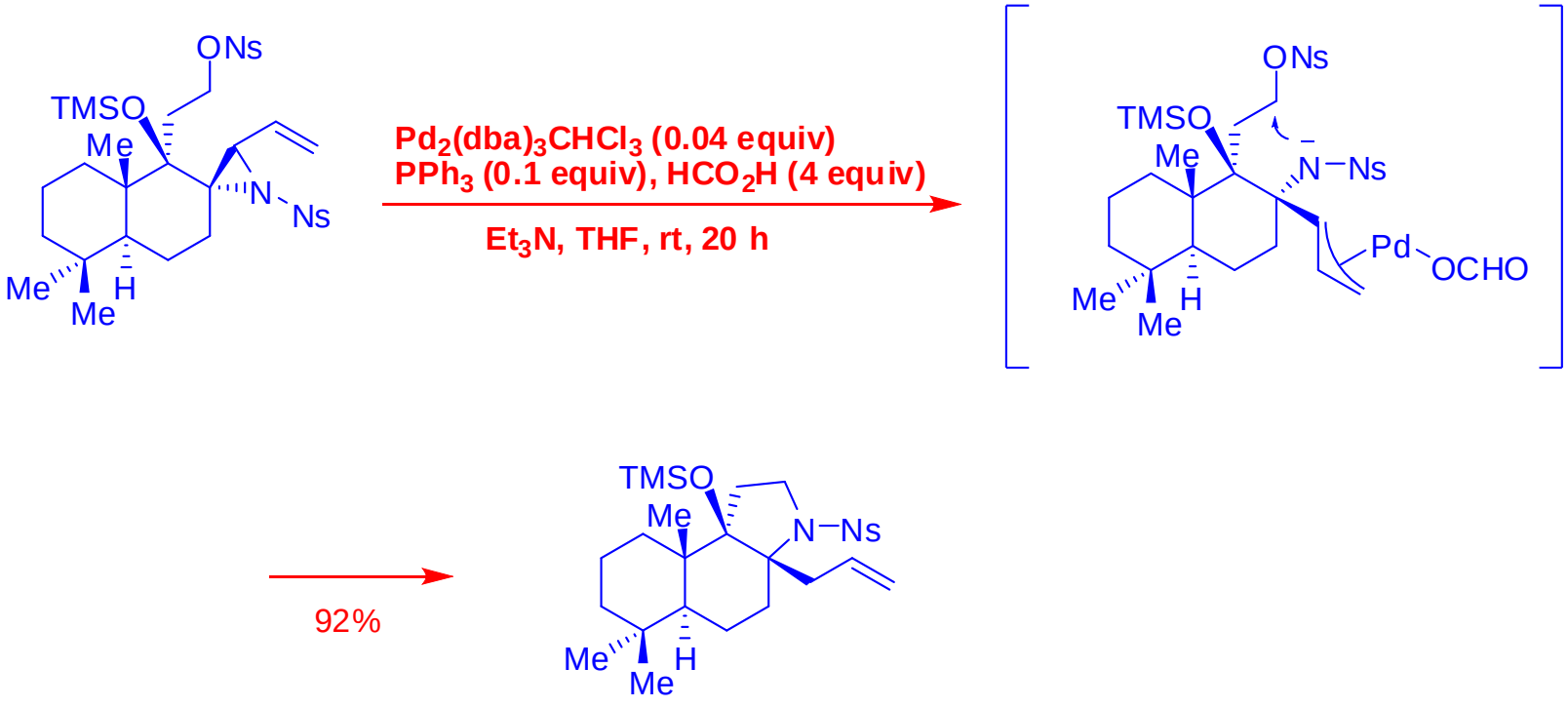
Crystal structure for Vinylaziridine Derivative





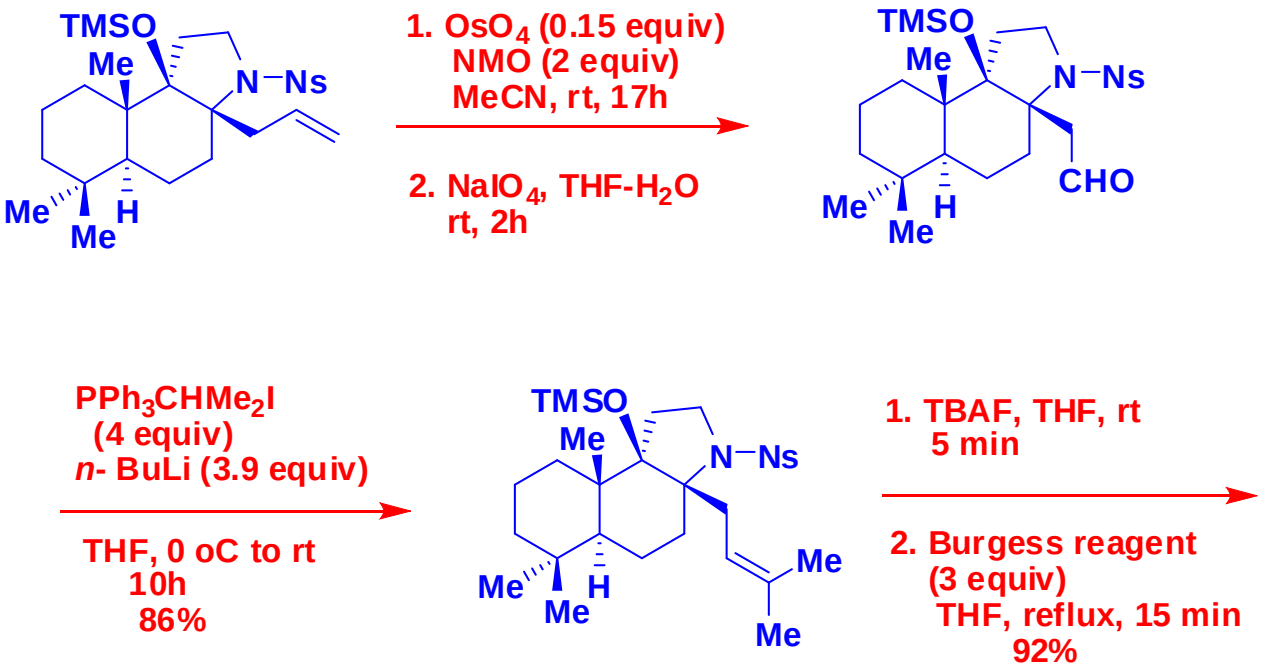
Org. Lett. **2012**, *14*, 6374-6376

Synthesis of Perhydrobenzoindole

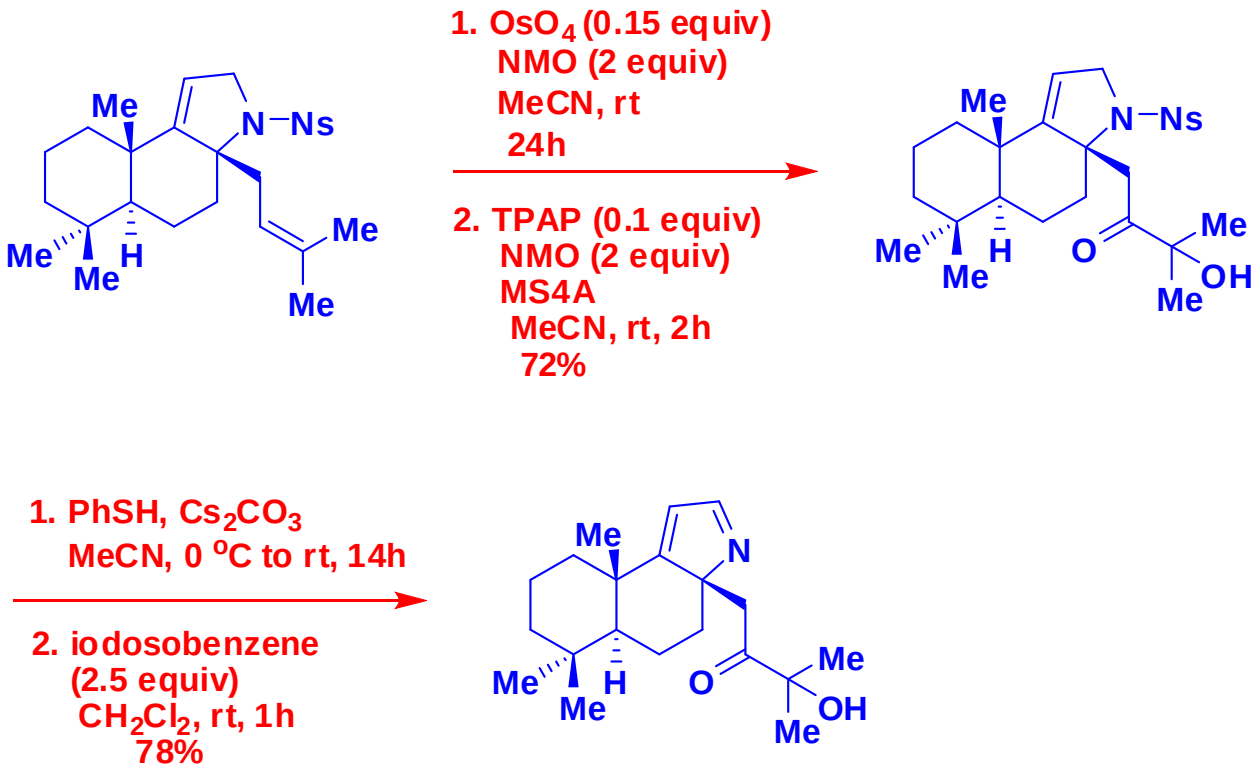


Org. Lett. **2012**, *14*, 6374-6376

Synthesis of (-)-Chamobtusin A



Org. Lett. **2012**, *14*, 6374-6376



(-)- Chamobtusin A

Org. Lett. **2012**, *14*, 6374-6376

Key features:

1. Novel aziridine formation from the corresponding 1,2- oxazine derivative

2. Palladium-mediated annulations of the vinylaziridine derivative

Conclusion:

1. Watanabe synthesized chamobtusin A in 13 steps with 5.3% overall yield

2. Aoyagi synthesized this molecule both optically active and racemic forms