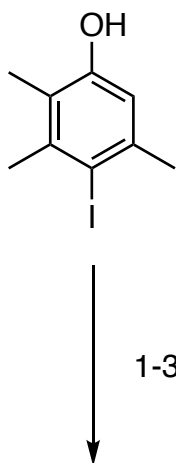


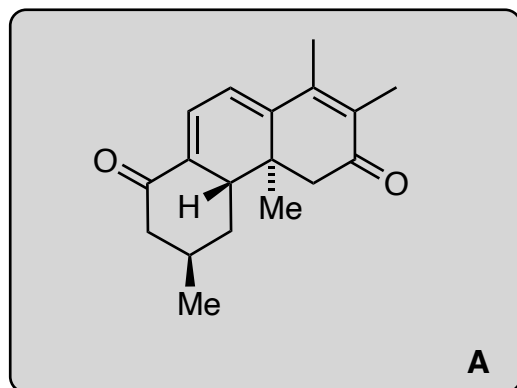
Concise Synthesis of Norzoanthamine Enabled by a Set of Photochemical Transformations

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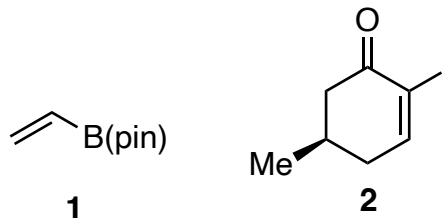


1-3



6-12

- 1) **1**, Pd(PPh₃)₄, NEt₃, dioxane, 120 °C
- 2) **2**, Pd(dppf)Cl₂, Cs₂CO₃, dioxane/H₂O, rt
- 3) Hg lamp, BHT, PhMe, -15 °C



- 4) Rh(PPh₃)₃Cl, Et₃SiH *then* K₂CO₃, MeOH
- 5) Oxone, CF₃COMe, NaHCO₃, Na₂EDTA, MeCN
- 6) BF₃·OEt₂, DCM *then* 2-ethyl-2-methyl-1,3-dioxolane
- 7) dimethyl fumarate, Hg lamp
- 8) CeCl₃, NaBH₄ (1.5 eq), MeOH, -15 °C *then* NaOH, THF
- 9) NHPI, DCC, DMAP
- 10) B₂(cat)₂, hv (λ = 450 nm), DMA *then* H₂O₂ (aq.)
- 11) K₂CO₃, MeCN, 105 °C
- 12) DMP (2 eq)

4) *Hint*: product has a molecular formula of C₁₈H₂₄O₂ and the NMR in CDCl₃ has four ¹³C peaks in 120-150 ppm region, one ¹H peak above 4 ppm.

6) Name the reaction for the first set of conditions. *Meinwald rearrangement*.

8) *Hint*: oxidation state is preserved in the B-ring.

