

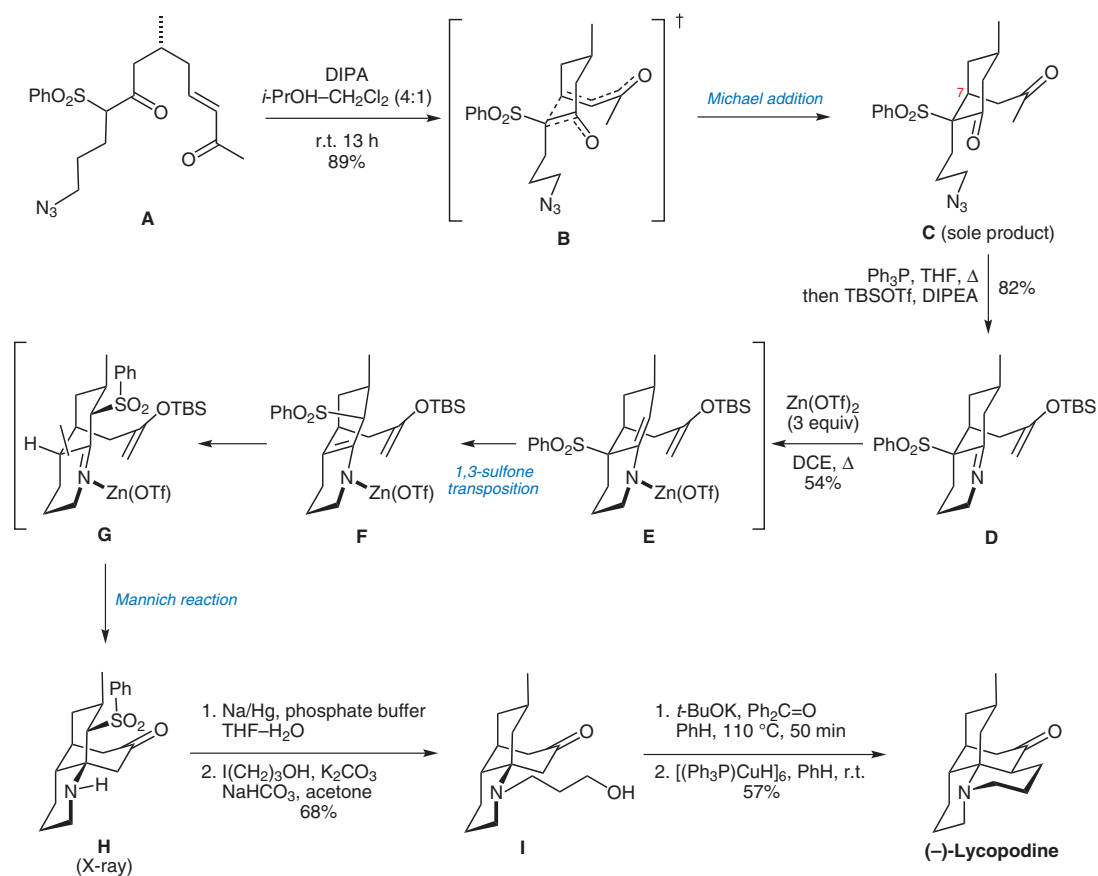
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H. YANG, R. G. CARTER,* L. N. ZAKHAROV (OREGON STATE UNIVERSITY, CORVALLIS, USA)

Enantioselective Total Synthesis of Lycopodine

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Synthesis of (-)-Lycopodine



Significance: An asymmetric synthesis of (-)-lycopodine by Carter and co-workers was based on sequential intramolecular Michael addition and Mannich reactions. A rare 1,3-transposition of an allylic sulfone was observed in the $\text{Zn}(\text{OTf})_2$ -catalyzed Mannich reaction transforming imine **D** to the tricycle **H**.

Comment: The intramolecular Michael addition of substrate **A** gave the correct stereochemistry at C-7 in **C** indicating that isomerization of the (*E*)-enone to a (*Z*)-enone must have preceded cyclization via the transition state **B**.

SYNFACTS Contributors: Philip Kocienski
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