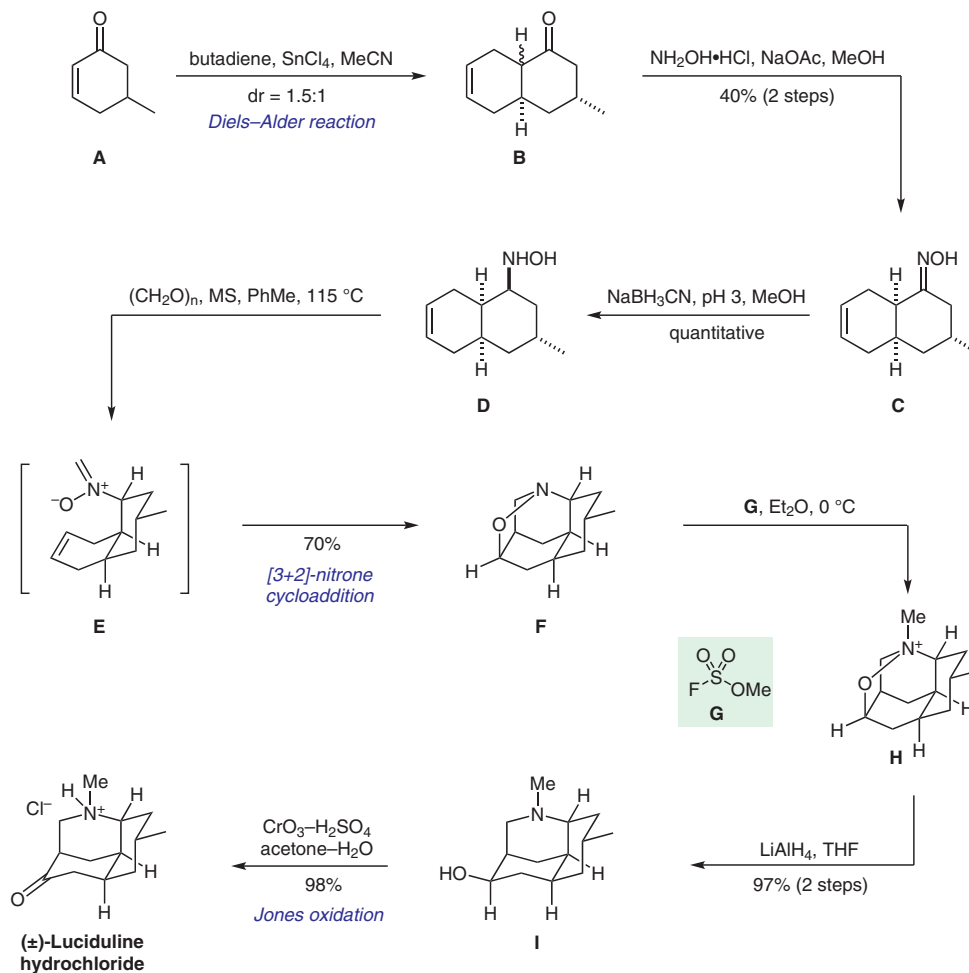


W. OPPOLZER\*, M. PETRZILKA (UNIVERSITY OF GENEVA, SWITZERLAND)  
A Total Synthesis of *d,l*-Luciduline by a Regioselective Intramolecular Addition of an *N*-Alkenylnitrone  
*J. Am. Chem. Soc.* **1976**, *98*, 6722–6723, DOI: 10.1021/ja00437a062.

## Total Synthesis of (±)-Luciduline



**Significance:** In 1976, Oppolzer and Petrzilka reported the total synthesis of luciduline, an alkaloid isolated from *Lycopodium lucidulum*. The route featured a highly regioselective [3+2]-nitronium cycloaddition, which in this strategic setting can be interpreted as an equivalent of a Mannich reaction. In addition, the authors reported a highly concise route consisting of only seven linear steps. Of note, no protecting groups were required to furnish the natural product in 27% overall yield.

**Comment:** Ketone B is generated by a Diels–Alder reaction between cyclohexenone A and butadiene. B is converted to oxime C at which stage the diastereomers are separated by crystallization. After reduction, nitronium E is generated in situ from hydroxylamine D by condensation with formaldehyde. The nitronium undergoes an intramolecular [3+2] cycloaddition to furnish isoxazolidine F. Methylation, reduction of the N–O bond, and subsequent Jones oxidation finish the total synthesis of (±)-luciduline hydrochloride.