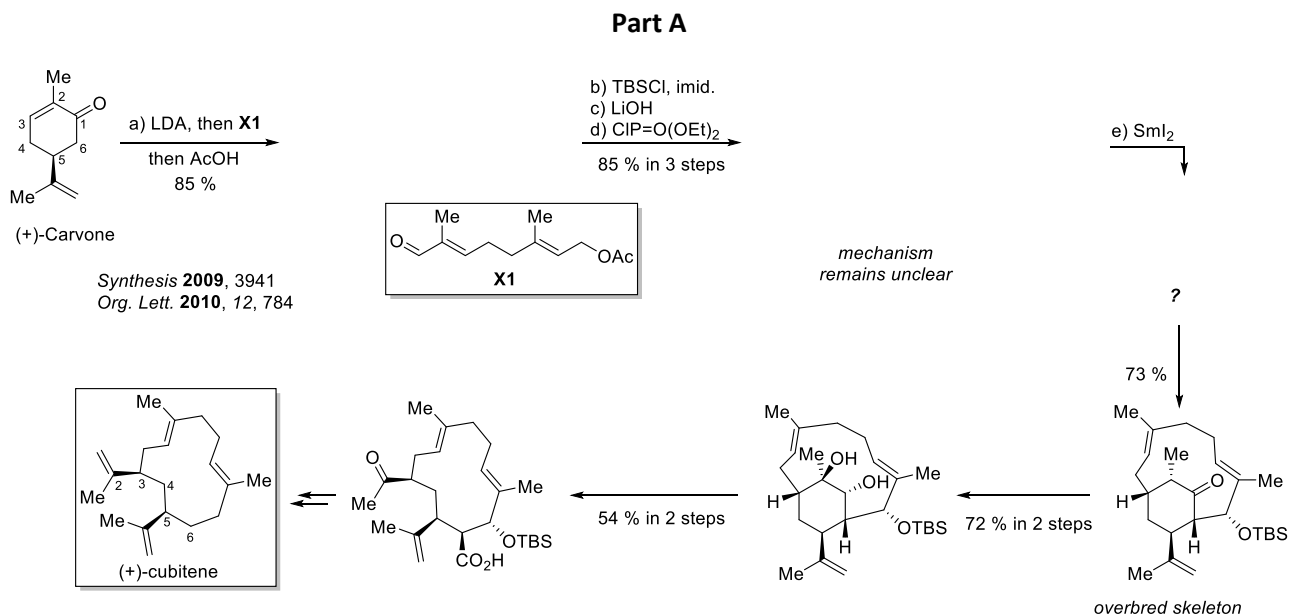
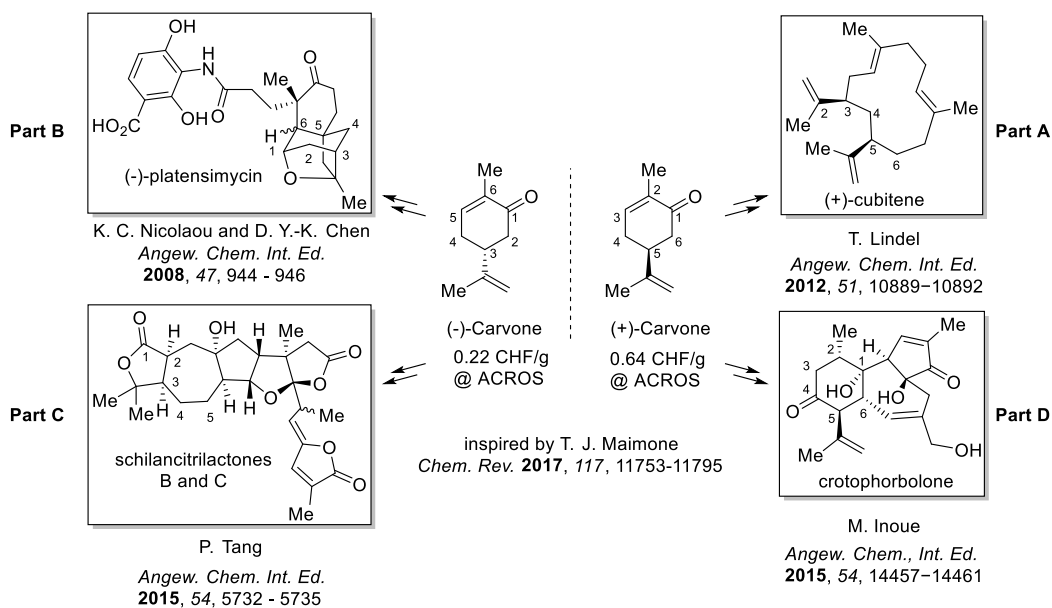
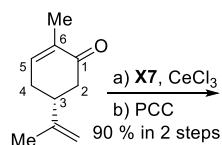


# Total synthesis starting from carvone

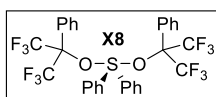
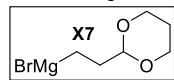
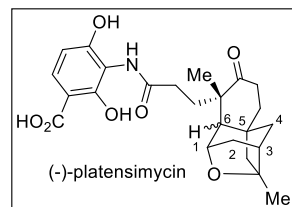
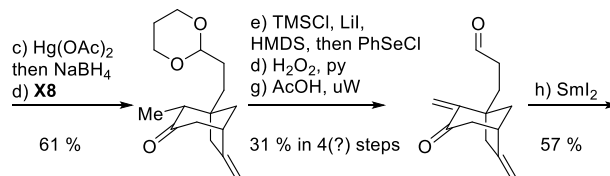


### Part B



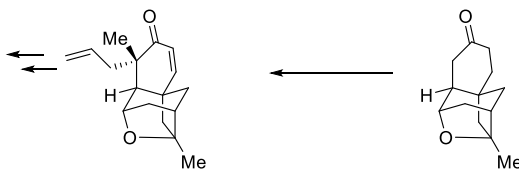
(-)-Carvone

Radicals in Organic Synthesis: Formation of Carbon-Carbon Bonds, Pergamon Press, Oxford, 1986



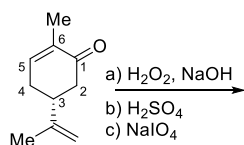
60 % in two steps  
ca. 1:1 dr

i)  $\text{DIAD}$ ,  $\text{PPh}_3$   
p-nitrobenzoic acid  
j)  $\text{KOH}$



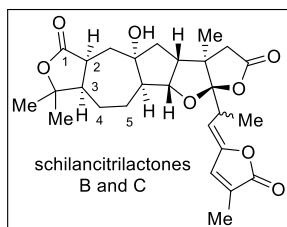
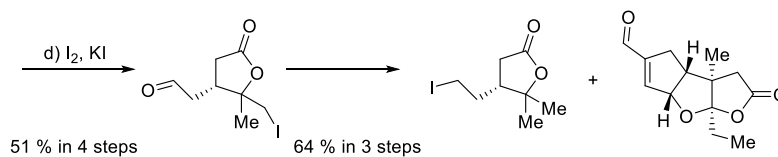
ca. 39 % in 4 steps

### Part C

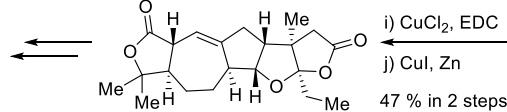


(-)-Carvone

*Can. J. Chem.* **1992**, *70*, 1406-1426



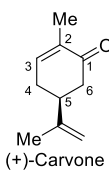
*Tetrahedron* **2007**, *63*, 10345



*Tetrahedron Lett.* **1988**, *29*, 5369

86 %  
h)  $\text{LDA}$

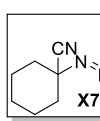
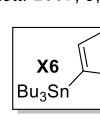
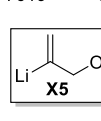
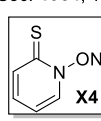
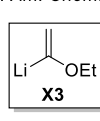
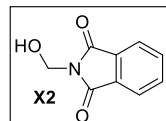
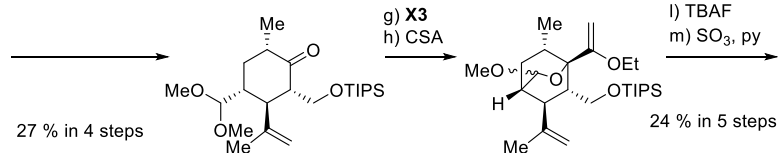
### Part D



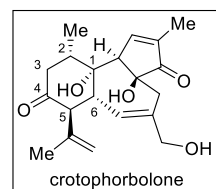
(+)-Carvone

*J. Am. Chem. Soc.* **1984**, *106*, 7619

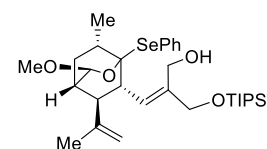
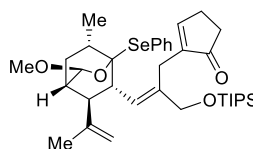
*Org. Lett.* **2007**, *9*, 1165



29 % in 5 steps

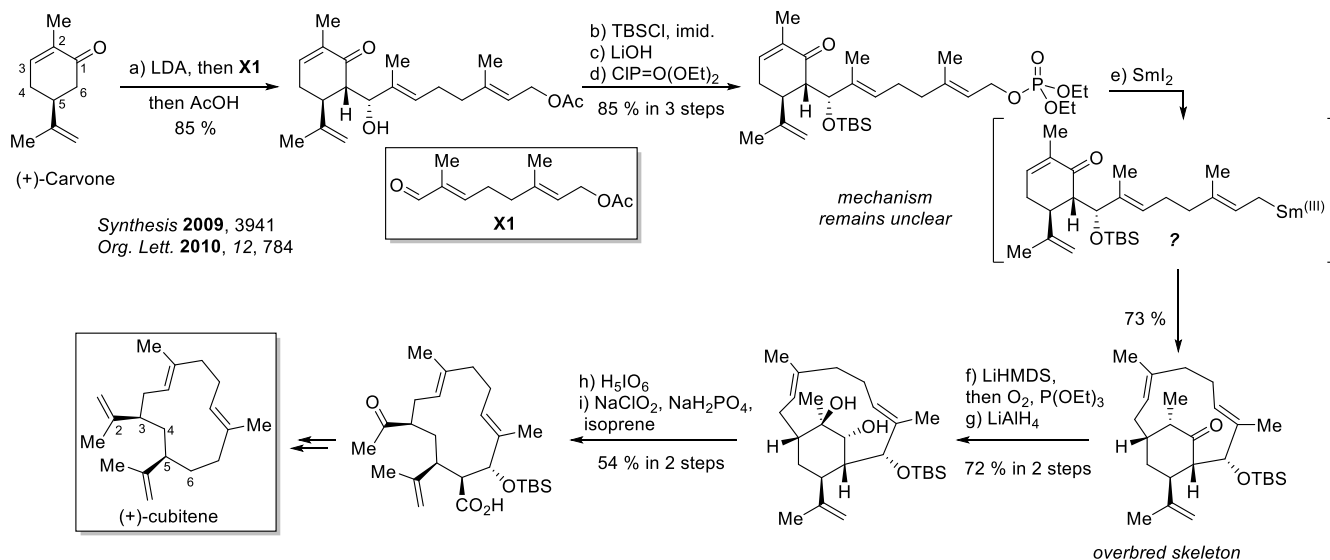


u) **X7**,  $(\text{TMS})_3\text{SiH}$   
69 %

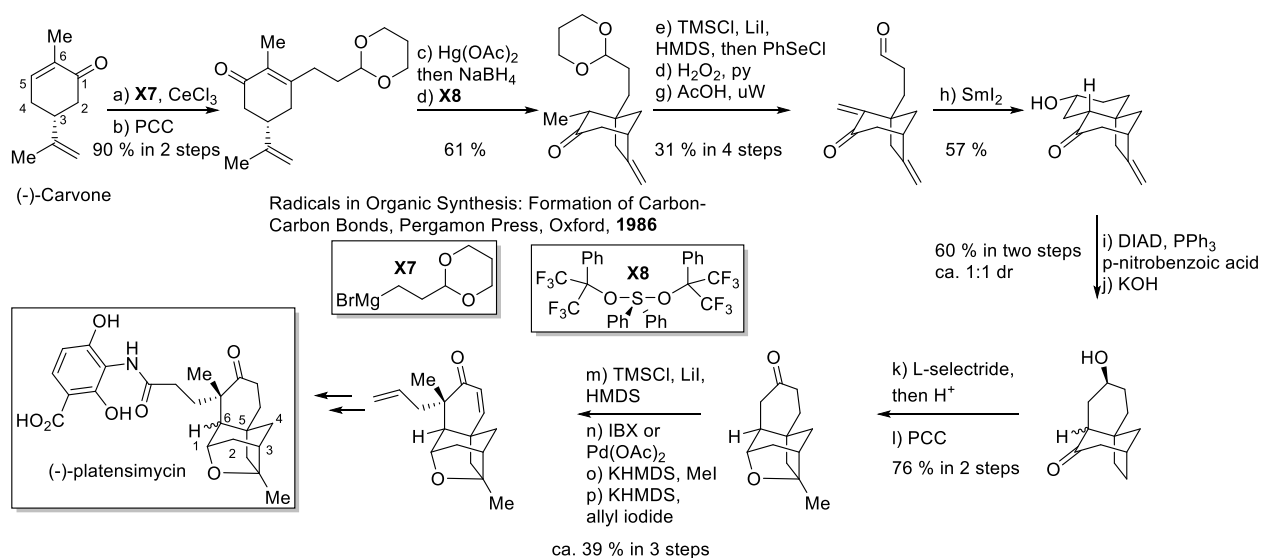


# Solutions

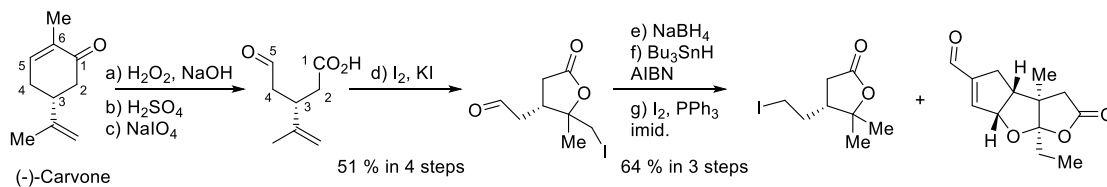
## Part A



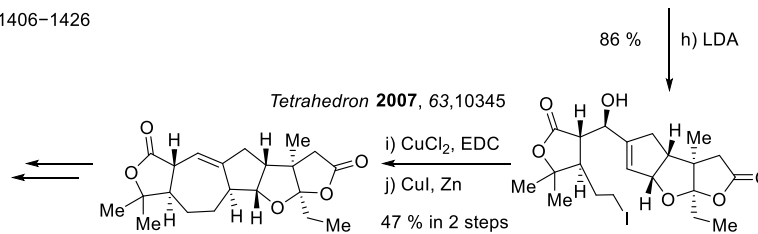
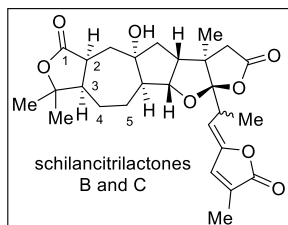
## Part B



### Part C



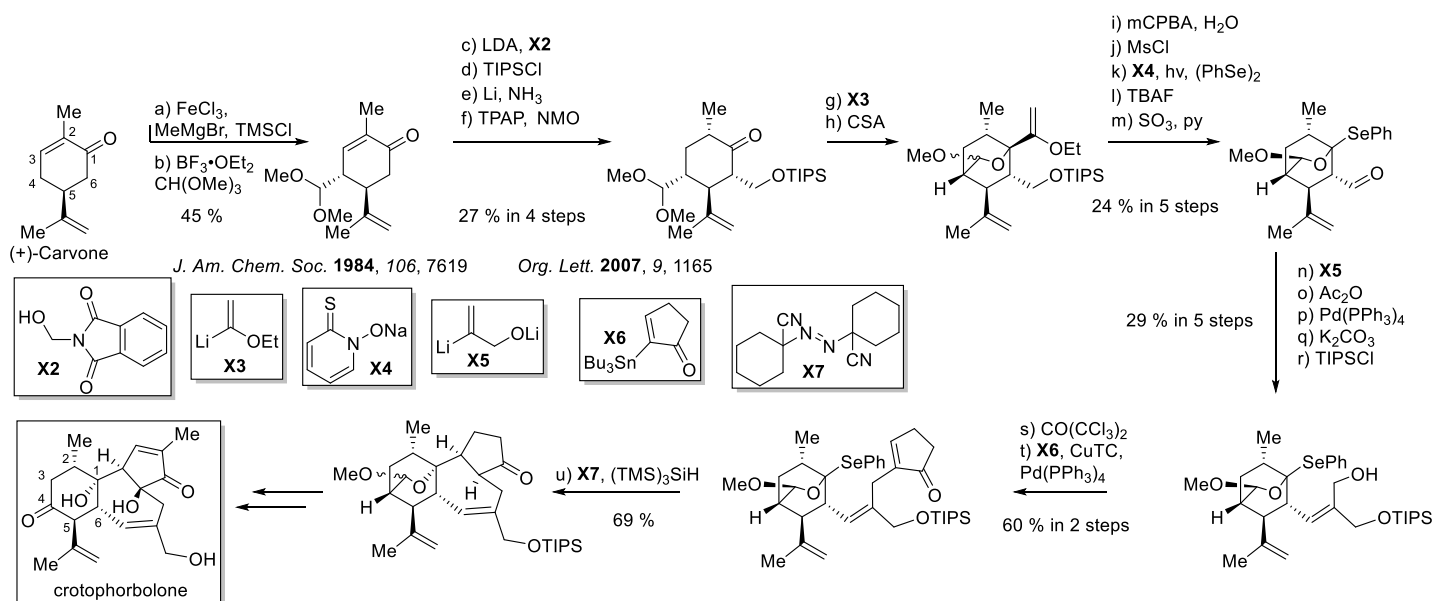
*Can. J. Chem.* **1992**, *70*, 1406–1426



*Tetrahedron* **2007**, *63*, 10345

*Tetrahedron Lett.* **1988**, *29*, 5369

### Part D



*J. Am. Chem. Soc.* **1984**, *106*, 7619

*Org. Lett.* **2007**, *9*, 1165

