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Diastereocontrol in Intermolecular Diels-Alder Reactions of Allenic Lactones: Synthetic Approach to the Plaunols

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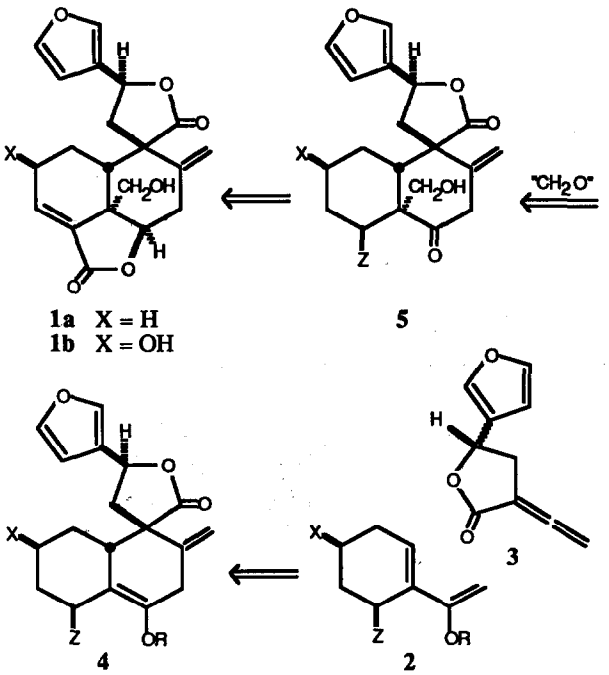
Summary: Diels-Alder cycloaddition of the allenic lactone **11** with 1-(1-(*t*-butyldimethylsilyloxy)vinyl)cyclohexene **6b** produces the desired cycloadduct **12** with good endo selectivity (4:1) and excellent diastereoselectivity.

Plaunol B and C, **1ab**, are diterpenes of the clerodane family[2] isolated from the stems of *Croton sublyratus* Kurz which were found to exhibit significant inhibitory activity against ulcers in Shay rats.[3] This activity appears to result from the ability of the plaunols to depress gastric secretions.[4] Several other structurally related diterpenes have also been isolated, including the insect antifeedants, the ajugarins.[5] Because of their interesting structures and biological activity, these molecules have engendered a lot of work aimed at their synthesis.[6] We proposed a synthetic approach



1a X = H
1b X = OH

5

3

4

2

References and Notes

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8) The stereochemistry of the major isomer **9a** was unambiguously assigned by x-ray analysis of one of its hydrolysis products, the conjugated enone with a cis ring juncture.

9) All questions concerning the x-ray structures should be directed to Dr. Kahn.

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12) The stereochemistry of the phenyl substituent in the minor isomer **13** is assumed based on steric arguments but has not been confirmed.

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