Electrolytic Macrocyclizations: Scalable Synthesis of a Diazonamide-Based Drug Development Candidate


Synthesis of DZ-2384

Significance: Diazonamide A, a metabolite of the ascidian *Dizona angulata*, displays potent in vitro activity against human colon cancer. DZ-2384 is a truncated analogue of diazonamide A that is 10- to 50-fold more efficacious than diazonamide A as an anti-mitotic agent in rodents. The synthesis of DZ-2384 proceeded in 13 total operations and 5.7% overall yield from L-tert-leucine.

Comment: The key step of the synthesis depicted is a macrocyclization initiated by an anodic oxidation of A at a graphite surface. Anodic oxidation of 60 grams of A gave 21 grams of a mixture of B (major) and its epi-C10,C11 diastereoisomer C (minor, dr = 2.7:1), which was separated from untreated A (11.0 g) by silica gel chromatography. Separation of the diastereoisomers was achieved after hydrogenolysis of the Cbz group.

SYNFACTS Contributors: Philip Kocienski

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