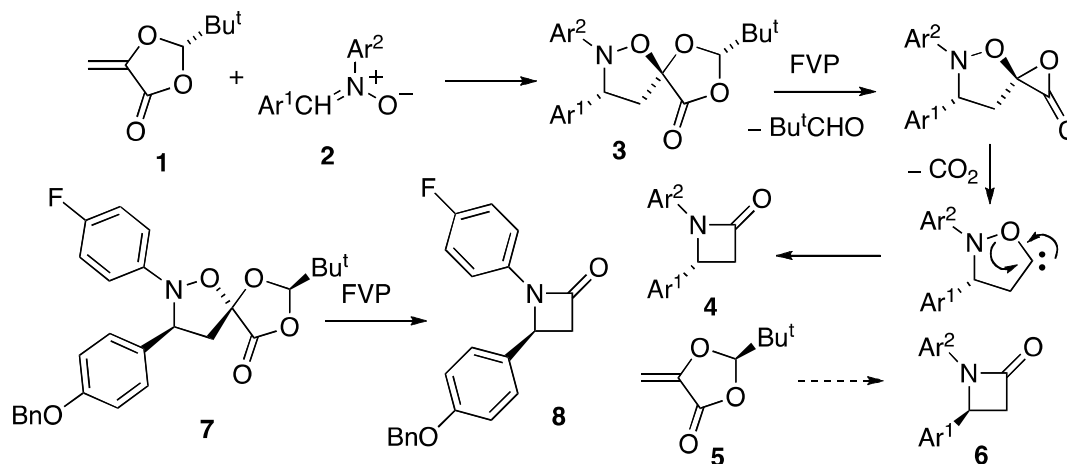


Asymmetric synthesis of β -lactams by gas phase pyrolysis

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The chiral methylenedioxyanone **1** is readily available from (S)-lactic acid but it has not been used as a dipolarophile for 1,3-dipolar cycloaddition before. Diarylnitrones **2** add stereoselectively to give spiro adducts **3**, and when these are subjected to flash vacuum pyrolysis at 440 °C, they eliminate Bu^tCHO and CO₂ as shown to give β -lactams **4** via an oxacarbene rearrangement.



The enantiomeric methylenedioxyanone **5**, conveniently available from (R)-alanine,¹ gives products **6** of the opposite enantiomeric series. Synthesis and FVP of the example **7** affords the advanced Ezetimibe precursor **8**, thus completing a formal total synthesis of this important cholesterol-lowering drug.

1 Aitken, R. A.; Meehan, A.; Power, L. A. *Synthesis* **2015**, 47, 1557–1559.