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REGARDING ASYMMETRIC INDUCTION ON THE SCHIFF BASES: A CORRECTION

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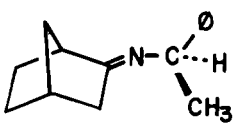
Summary: The condensation of racemic 2-norbornanone and chiral α-phenylethylamine has been shown to produce four diastereomeric Schiff bases rather than only one as previously reported.

In a recent publication of this Journal, Bérubé and Jankowski[1] reported that the condensation of R-α-phenylethylamine with racemic 2-norbornanone "produced only one compound", a Schiff base formulated as 1. Subsequent oxidation with m-chloroperbenzoic acid was reported to give four diastereomeric oxaziranes. Since no explanation was provided for this stereochemical multiplication, we re-examined this reaction sequence and here report our findings.



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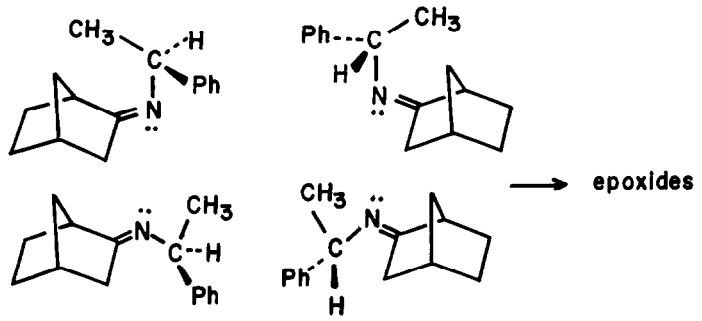
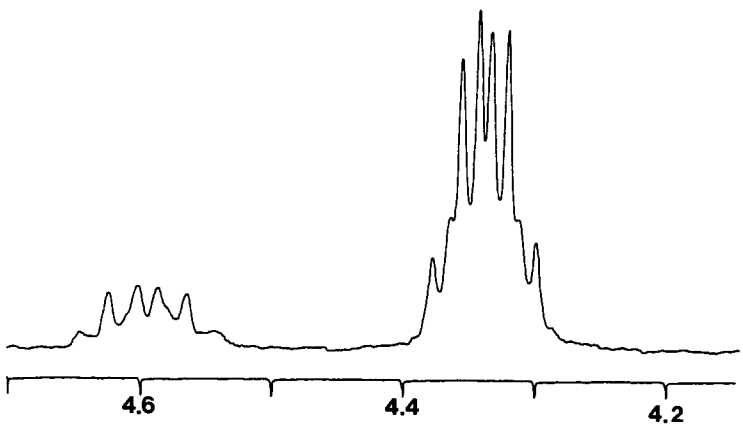


1a - d

In our hands the condensation of 2-norbornanone with (S)-α-phenylethylamine in refluxing benzene afforded not one, but all four of the *expected* diastereomers (1a-d). Two major components (80%) were obtained in an approximately 1:1 ratio. The 300 MHz ^{1}H nmr spectrum of the product mixture shows methine quartets at δ4.33 and 4.32 and methyl doublets at δ1.42 and 1.45. The minor isomers (also in about a 1:1 ratio) showed methine quartet resonances at δ4.57 and 4.61. The relevant part of the spectrum is reproduced in the Figure.



We assume that the major and minor products represent the E and Z isomers, respectively. Oxidation of our product mixture gave the four oxaziranes with nmr spectral properties identical to those reported by Bérubé and Jankowski.[1] It is true that a 90 MHz spectrum of 1 does show a single quartet at δ4.3, but two methyl doublets are clearly discernable. Accordingly, the explanations concerning subsequent asymmetric induction and the structural assignments made by these authors must be regarded with suspicion.

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Reference

1. G. Bérubé and K. Jankowski, Tetrahedron Letters, 2857 (1982).

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