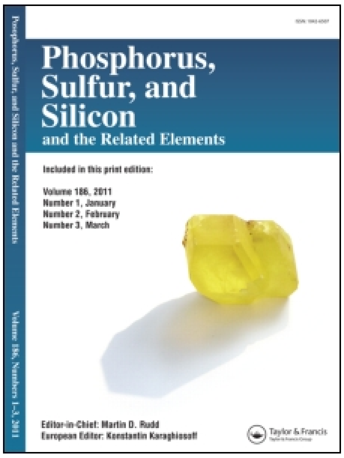


Phosphorus, Sulfur, and Silicon and the Related Elements

Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713618290

Diastereoselective Reactions of Allylic Sulfoximine Anions

Stephen G. Pyne[a]; Zemin Dong[a]
[a] Department of Chemistry, University of Wollongong, Wollongong, NSW, Australia

To cite this Article Pyne, Stephen G. and Dong, Zemin(1994) 'Diastereoselective Reactions of Allylic Sulfoximine Anions', Phosphorus, Sulfur, and Silicon and the Related Elements, 95: 1, 425 — 426

To link to this Article: DOI: 10.1080/10426509408034262

URL: http://dx.doi.org/10.1080/10426509408034262

Phosphorus, Sulfur, and Silicon, 1994, Vol. 95–96, pp. 425–426
Reprints available directly from the publisher
Photocopying permitted by license only

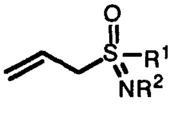
DIASTEREOSELECTIVE REACTIONS OF ALLYLIC SULFOXIMINE ANIONS

STEPHEN G. PYNE,* AND ZEMIN DONG

Department of Chemistry, University of Wollongong, Wollongong, NSW, 2522, Australia.

Abstract The conjugate addition reactions of lithiated *N*-p-tolyl *S*-phenyl *S*-2-propenyl sulfoximine (4) with cyclic and acyclic enones gives exclusively 1,4-α adducts, the reactions with acyclic enones are highly diastereoselective.

In contrast to the chemistry of allylic sulfoxides and sulfones relatively little is known about the chemistry of allylic sulfoximines.[1] In 1979, Johnson[2] disclosed the synthesis of the first reported allylic sulfoximine. The synthesis of enantiomerically pure allylic sulfoximines has been recently reported,[3,4] and Gais has demonstrated they undergo S_N2 or S_N2' like displacement reactions with homocuprates.[3] In 1991 Harmata[5] reported that the reaction of lithiated (1) with either 2-cyclopentenone or 2-cyclohexenone gave mixtures in which the 1,4-α adducts were slightly favoured over the 1,4-γ adducts. More recently we have reported that the conjugate addition reactions of lithiated (3) with cyclic and acyclic Michael acceptors gives mainly 1,4-γ and 1,4-α adducts respectively in THF and 1,4-α and 1,4-γ adducts respectively in HMPA/THF.[6] Although the 1,4-γ adducts from cyclic enones could be isolated in high diastereomeric purity, these reactions proceeded with modest regioselectivity with respect to α verses γ attack on the lithiated sulfoximine. Furthermore acyclic enones gave products from 1,2 and 1,4 addition of lithiated (3).



(1), R^1 = p-Tol, R^2 =Ph
(2), R^1 = Ph, R^2 = H
(3), R^1 = Ph, R^2 = SiBu^{t}Ph$_2$
(4), R^1 = Ph, R^2 = p-Tosyl

In this lecture I report the stereochemistry and diastereoselectivity of the conjugate addition reactions of lithiated *N*-p-tolyl *S*-phenyl *S*-2-propenyl sulfoximine (4) with enones. The results of these investigations are summarized in the Table.

In contrast to the chemistry reported for lithiated (1)[5] and (3)[6], lithiated (4) gave exclusively 1,4-α adducts with both cyclic and acyclic enones.[7] Interestingly the regiochemistry of the reaction of lithiated (4) with enones is also different to that of lithiated allyl phenyl sulfone which gives exclusive 1,4-γ adducts with cyclic enones and 1,4-α adducts with acyclic enones.[8]

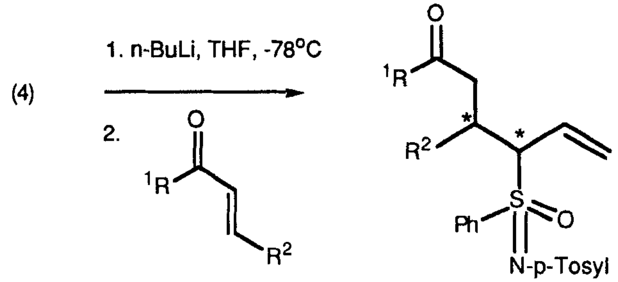


TABLE. Conjugate addition reactions of lithiated 4 with enones.

Entry	Enone R1	R2	Diastereomeric ratio	Yield (%)
1	$-(CH_2)_2-$		49 : 33 : 10 : 8	87
2	$-(CH_2)_3-$		47 : 25 : 14 : 14	92
3	Ph	Ph	93 : 7	90
4	Me	Ph	90 : 10	45
5	Ph	Me	94 : 6	61
6	Me	Me	84 : 16	71

The application of these reagents to the asymmetric synthesis of chiral acyclic molecules is currently under active investigation.

REFERENCES

1. For a recent review on diastereoselective reactions of sulfoximines see: S. G. Pyne, *Sulfur Reports*, **12**, 57 (1992).
2. C. R. Johnson, E. U. Jonsson and A. Wambsgams, *J. Org. Chem.*, **44**, 2061 (1979).
3. J. Bund, H.-J. Gais and I. Erdelmeier, *J. Am. Chem. Soc.*, **113**, 1442 (1991).
4. M. Reggelin and H. Weinberger, *Tetrahedron Lett.*, **33**, 6959 (1992).
5. M. Harmata and R. J. Claassen II, *Tetrahedron Lett.*, 1991, **32**, 6497 (1991).
6. S. G. Pyne and G. Boche, *Tetrahedron,* **49**, 8449 (1993).
7. S. G. Pyne, Z. Dong, B. W. Skelton and A. H. White, *J. Chem. Soc., Chem. Commun.*, 751 (1994).
8. G. A. Kraus and K. Frazier, *Syn Commun.*, **8**, 483 (1978).