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NEW PUBLICATIONS

Dietary Fibre: Chemical and Biological Aspects

Edited by: D. A. T. Southgate, K. Waldron, I. T. Johnson, and G. R. Fenwick, *AFRC Institute of Food Research, Norwich*
Special Publication No. 83

Hippocrates (460–377 BC) recommended the eating of wholemeal bread for its 'salutary effects upon the bowels', yet it is only in recent years that the potential health implications of dietary fibre have begun to be fully investigated.

Advances made in the last two decades have provided increasing insights into the chemical complexity of dietary fibre and this important book reviews the current state of knowledge on the role of fibre in the diet. It covers such areas such as the chemistry of dietary fibre, health benefits to the consumer, effects on the small and large intestine, effect on lipid metabolism, implications to industry and more . . .

Dietary Fibre: Chemical and Biological Aspects will prove essential reading for food chemists and technologists, nutritionists, biological scientists, clinicians, the food and pharmaceutical industries, and regulatory bodies.

Brief Contents:

Dietary Fibre, Health and the Consumer.
Chemistry of Dietary Fibre.
Analytical Techniques.
Effect of Fibre on the Small Intestine: Implications for Digestion and Nutrient Absorption.
Dietary Fibre in the Large Intestine: Implications for Colorectal Function and Energy Metabolism.
Dietary Fibre and Lipid Metabolism.
Dietary Fibre and the Food and Pharmaceutical Industries.

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Food Irradition and the Chemist

Edited by: D. E. Johnston and M. H. Stevenson, *Queen's University, Belfast* and *Department of Agriculture for Northern Ireland*
Special Publication No. 86

Food Irradiation and the Chemist reviews the chemical challenges facing the food industry regarding food irradiation, especially in the key area of detection methodology.

The book looks at the most promising techniques currently available for the detection of irradiated foods and discusses their suitability to different food groups. It also covers the latest work on the effect of irradiation on polymer additives, potential taint and irradiated food contact plastics, the effects of irradiation on micro-organisms and their biochemistry, and much more . . . **Food Irradiation and the Chemist** will be of great interest to scientists from a wide range of disciplines involved in the investigation of food irradiation.

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Radiation, Micro-organisms, and Radiation Resistance.
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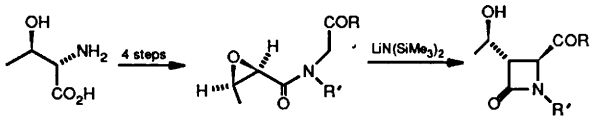
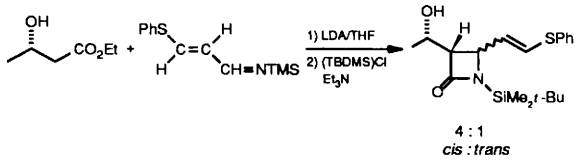
Reagents for β-Lactam Syntheses

Since the discovery of the "β-lactam connection" in the activity of penicillin,[1] many preparations surrounding this small ring have been developed. Several fine reviews[2-4] on this topic are available and we present here a brief glimpse into this interesting field.

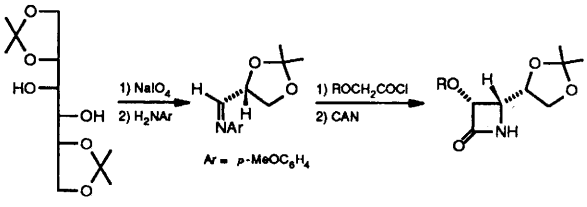
Significant among the many existing synthetic methods are ones based on readily available α-amino acids, especially in their optically active form. Usually, a condensing reagent such as acetic anhydride or thionyl chloride is required to complete the condensation in a direct cyclization. Compounds derived from α-amino acids, such as the following epoxide,[5] have also been utilized.



Another popular entry into this structure is through an ester-enolate-imine condensation, an example of which is given below.[6]



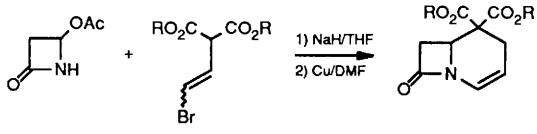
A different approach is illustrated by the cyclization of a Schiff base and an alkoxy acetyl chloride.[7] The transformation shown here also highlights the importance of the *p*-anisyl protecting group in β-lactam chemistry as it is easily and mildly removed with ceric ammonium nitrate (CAN).



Many other methods for the construction of the β-lactam ring have been published and include [2+2] cycloadditions of sulfonyl isocyanates with carbon-carbon double bonds,[8] Mitsunobu reactions,[9] aziridine ring expansions,[10] organometallic reactions,[3] and enzymatic methods.[11]

Elaboration of an existing β-lactam is a second major route to these products. Appropriate substitution reactions with 4-acyloxy compounds have had the greatest utility and a comprehensive review has been written by Mickel.[12] In a recent example,[13] a new route to a carbacephem involved reaction of 4-acetoxy-2-azetidinone with a malonate derivative followed by copper-mediated cyclization.

Aldrich provides many reagents to assist in the production and modification of β-lactams. With so many new and existing methodologies, we are constantly updating our list. If you have any suggestions, please contact us at 800-255-3756.



Representative reagents:

27,215-9 **4-Acetoxy-2-azetidinone,** 99% **1g $18.50; 5g $74.60**

21,547-3 **Ammonium cerium(IV) nitrate,** 99+% A.C.S. reagent (CAN) **250g $27.20; 500g $40.10; 1.5kg $126.00**

A8,825-5 ***p*-Anisidine,** 99% **100g $7.25; 250g $17.10; 1kg $47.30**

32,846-4 **2-Azetidinone,** 98% **250mg $8.10; 1g $24.60; 5g $94.10**

23,229-7 **Benzenesufonyl isocyanate** **1g $11.10; 10g $61.10**

31,085-9 **4-Benzoyloxy-2-azetidinone,** 98% **5g $13.10; 25g $44.00**

14,266-2 **Chlorosulfonyl isocyanate,** 98% (CSI) **25g $20.90; 100g $55.70; 1kg $369.60**

D9,000-8 **Diethyl azodicarboxylate** (DEAD) **5g $11.00; 25g $38.30; 100g $119.30**

29,640-6 **1,2:5,6-Di-*O*-isopropylidene-D-mannitol,** 98% **5g $16.20; 25g $67.50**

34,732-9 **Ethyl (*R*)-(-)-3-hydroxybutyrate,** 98% **1g $9.70; 5g $32.40**

22,577-0 **Lithium bis(trimethylsilyl)amide,** 1.0*M* solution in tetrahydrofuran **100ml $15.50; 800ml $81.70; 8L $377.40; 18L $706.70**

18,927-8 ***p*-Toluenesulfonyl isocyanate** **5g $5.00; 100g $11.40; 500g $39.60**

References

(1) Clarke, H.T.; Johnson, J.R.; Robinson, R. *The Chemistry of Penicillin*; Princeton University Press: Princeton, 1949. (2) Hart, D.J.; Deok-Chan, H. *Chem. Rev.* **1989**, *89*, 1447. (3) Barrett, A.G.M.; Sturgess, M.A. *Tetrahedron* **1988**, *44*, 5615. (4) Mukeyee, A.K.; Srivastava, R.C. *Synthesis* **1973**, 327. (5) Kugelman, M. *et al. Synlett* **1990**, 431. (6) Hart, D.J.; Ha, D.C. *Tetrahedron* **1989**, *45*, 1283. (7) Bose, A.K. *et al. J. Chem. Soc., Chem. Commun.* **1986**, 161. (8) Ito, Y.; Kobayashi, Y.; Terashima, S. *Tetrahedron Lett.* **1989**, *30*, 5631. (9) Williams, M.A.; Miller, M.J. *Tetrahedron Lett.* **1990**, *31*, 1807. (10) Chamchaang, W.; Pinhas, A.R. *J. Org. Chem.* **1990**, *55*, 2943. (11) Baldwin, J.E.; Pitlik, J. *Tetrahedron Lett.* **1990**, *31*, 2483. (12) Mickel, S.J. *Aldrichim. Acta* **1985**, *18*, 95. (13) Joyeau, R. *et al. Tetrahedron Lett.* **1989**, *30*, 337.