NEW BOOKS FOR ORGANIC CHEMISTS AND BIOCHEMISTS

Enzyme Mechanisms

Edited by M. Page
Huddersfield Polytechnic

The mechanisms of enzyme catalysed reactions are now understood at the molecular level. Understanding how enzymes work is the first step towards the successful application of enzymes as catalysts in large scale synthesis both in the laboratory and industry. The design of new drugs as enzyme inhibitors is advanced by a knowledge of the reaction mechanism.

This book has several contributors who are experts in their own field, and each emphasises the important role that mechanisms play in building the bridges between chemistry and the biological sciences.

Enzyme Mechanisms discusses the chemistry and mechanisms of enzyme catalysed reactions and is suitable for readers of advanced undergraduate level and above.

Hardcover approx 560pp
ISBN 0 85186 947 5
Price £95.00 ($183.00)
RSC Members price £60.00

Chemical Aspects of Food Enzymes

The use of food enzymes to facilitate an industrial manufacturing process has many attractions compared to purely chemical reaction mechanisms. These include the speed of reaction, the fact that the reactions take place under mild conditions and, most importantly, that they are highly specific, often stereospecific. The mild conditions reduce energy costs and the high specificity minimises the need for downstream processing. There are problems however with enzyme stability, enzyme reactor poisoning and enzyme hygiene. The efficiency of the reaction can be reduced by build-up of product concentration and the adsorption of inactive components such as lipids or other biopolymers.

The manufacture of cheese, beer, bakery products and other fermented produce employs enzymes in their earliest applications. The use of enzymes in a more sophisticated manner can present difficulties with regard to the huge tonnages of materials that need to be processed.

This publication reviews current applications of enzymes in food processes. It should stimulate interest and point the way forward in this area of vital importance.

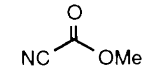
Edited by A. T. Andrews
AFRC Institute of Food Research, Reading

Softcover 326pp
ISBN 0 85186 686 7
Price £37.50 ($72.00)
RSC Members price £24.50

ROYAL SOCIETY OF CHEMISTRY
Information Services

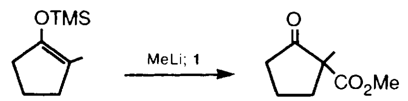
ORDERING:
RSC Members should send their orders to: The Royal Society of Chemistry, Membership Manager, 30 Russell Square, London WC1B 5DT, UK. Non-RSC Members should send their orders to: The Royal Society of Chemistry, Distribution Centre, Blackhorse Road, Letchworth, Herts SG6 1HN, UK.

MANDER'S REAGENT
Methyl cyanoformate



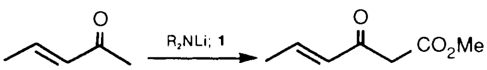
1

In 1983, Professor Lewis Mander introduced **methyl cyanoformate (1)** as a reagent which alleviates the frequently encountered problem of competing O-acylation during the C-acylation of ketone enolates. This reagent reacts normally in a highly selective manner with preformed lithium enolates[1a] of ketones at the "softer" carbon of the ambident nucleophile affording β-ketoesters almost exclusively under very mild conditions. Since Mander's original report, the reagent has found wide application in organic synthesis and is now familiarly known as **Mander's Reagent.** The following examples highlight its synthetic utility.



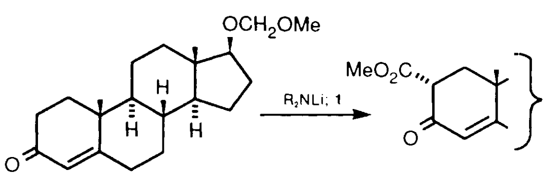
(ref. 1a)

72%



(ref. 1a)

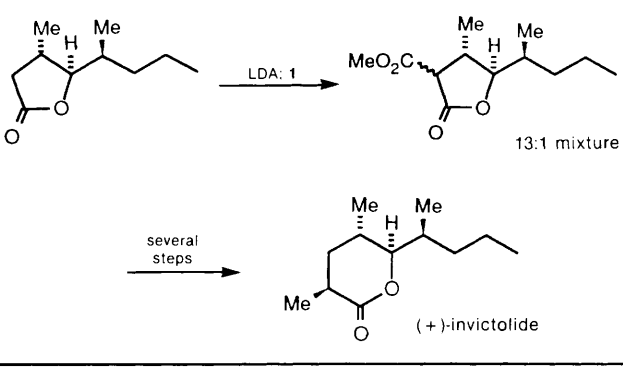
65%



(ref. 1a)

96%

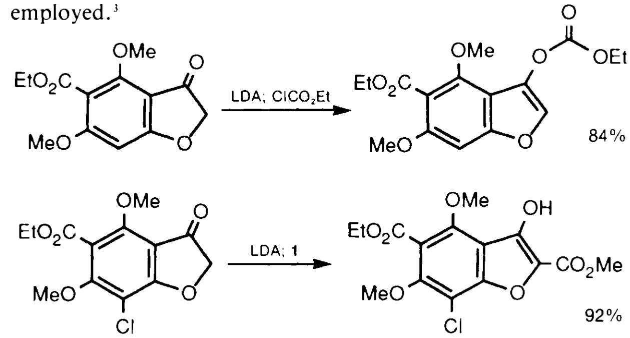
Ziegler and co-workers have used **Mander's Reagent** in the synthesis of the insect pheromone (+)-invictolide.



13:1 mixture

(+)-invictolide

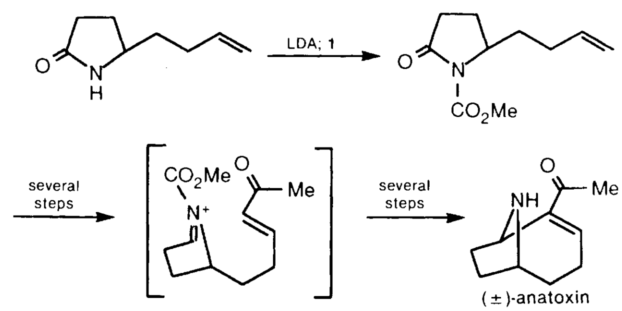
During the synthesis of a griseofulvin analog, Yamato and coworkers observed that acylation performed using ethyl chloroformate yielded mainly O-acylated product, whereas the C-acylated product was obtained in 92% yield when **Mander's Reagent** was employed.[3]



84%

92%

Speckamp and co-workers employed **Mander's Reagent** for N-acylation of a 2-pyrrolidone derivative, which in turn served as an intermediate in the synthesis of (±)-anatoxin, a potent neurotoxin.



(±)-anatoxin

Similar reagents such as **benzyl cyanoformate** and **ethyl cyanoformate** are also available.

References:

1) a) Mander, L.N.; Sethi, P. *Tetrahedron Lett.* **1983**, *24*, 5425.
   b) House, H.O. In *Modern Synthetic Reactions,* 2nd ed.; W.A. Benjamin, Inc.: Menlo Park, 1972; pp 734-816.
2) Ziegler, F.E.; Stirchak, E.P.; Wester, R.T. *Tetrahedron Lett.* **1986**, *27*, 1229.
3) Yamato, M.; Yoshida, H.; Ikezawa, K.; Kohashi, Y. *Chem. Pharm. Bull.* **1986**, *34*, 71.
4) Speckamp, W.N.; Melching, K.H.; Hiemstra, H.; Klaver, W.J. *Tetrahedron Lett.* **1986**, *27*, 4799.

31,981-3 **Methyl cyanoformate,** 99% **(1)** (Mander's Reagent) **5g $12.00; 25g $48.00**

32,058-7 **Benzyl cyanoformate,** 98% **5g $12.00**

E1,885-9 **Ethyl cyanoformate,** 99% **10g $15.35; 50g $58.50**

24,661-1 **Lithium diisopropylamide,** 97% (LDA) **25g $39.70; 100g $109.95**

29,696-1 **Lithium diisopropylamide,** 10 wt. % suspension in hexanes (LDA) **75g $9.80; 500g $41.40**

chemists helping chemists in research & industry

aldrich chemical co.

® *P.O. Box 355, Milwaukee, Wisconsin 53201 USA • (414) 273-3850*

USA
Aldrich Chemical Co., Inc.
940 West Saint Paul Avenue
Milwaukee, Wisconsin 53233
Telephone: (414) 273-3850
TWX: (910) 262-3052 Aldrichem MI
Telex: 26 843 Aldrich MI
FAX: (414) 273-4979

Belgium
Aldrich Chemie N.V./S.A.
6 Rue Caporal Claes
B-1030 Brussels
Telephone: (02) 2428750
Telex: 62302 Alchem B

France
Aldrich-Chimie S.a.r.l.
27, Fossé des Treize
F-67000 Strasbourg
Telephone: (88) 327010
Telex: 890076 Aldrich F
FAX: (88) 75 12 83

Japan
Aldrich Japan
Kyodo Bldg. Shinkanda
10 Kanda-Mikuracho
Chiyoda-Ku, Tokyo
Telephone: (03) 258-0155
FAX: (03) 258-0157

United Kingdom
Aldrich Chemical Co., Ltd.
The Old Brickyard, New Road
Gillingham, Dorset SP8 4JL
Telephone: (07476) 2211
Telex: 417238 Aldrch G
FAX: (07476) 3779

West Germany
Aldrich-Chemie GmbH & Co. KG
D-7924 Steinheim
Telephone: (07329) 87-0
Telex: 714838 Aldri D
FAX: (07329) 87-39