

annual reports in organic synthesis - 1981

edited by L.G. Wade, Jr. and Martin J. O'Donnell

academic press

A Subsidiary of Harcourt Brace Jovanovich, Publishers

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edited by

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ACADEMIC PRESS 1982

A Subsidiary of Harcourt Brace Jovanovich, Publishers

NEW YORK LONDON

PARIS SAN DIEGO SAN FRANCISCO SÃO PAULO SYDNEY TOKYO TORONTO

Academic Press Rapid Manuscript Reproduction

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ACADEMIC PRESS, INC.

111 Fifth Avenue, New York, New York 10003

United Kingdom Edition published by
ACADEMIC PRESS, INC. (LONDON) LTD.
24/28 Oval Road, London NW1 7DX

LIBRARY OF CONGRESS CATALOG CARD NUMBER: 17-167779

ISBN: 0-12-040812-0

PRINTED IN THE UNITED STATES OF AMERICA

82 83 84 85 9 8 7 6 5 4 3 2 1

**Annual Reports
in Organic
Synthesis—1981**

Annual Reports in Organic Synthesis

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John McMurry and R. Bryan Miller, Eds.

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ANNUAL REPORTS IN ORGANIC SYNTHESIS—1981

L. G. Wade, Jr., and Martin J. O'Donnell, Eds.

PREFACE

One of the most difficult problems facing chemists today is that of "keeping up with the literature." For several reasons, the problem is particularly severe for the synthetic organic chemist. Bits of information of potential use are scattered throughout common chemistry journals and can be found in any paper, not just those dealing strictly with synthesis. Thus, a synthetic chemist must read a large number of journals and must organize and index what he reads to make the information available for future reference. All synthetic chemists do this; but the task is becoming more difficult each year as the flow of information increases.

The problem, however, is shared to some extent by all. Most organic chemists are at some time faced with the problem of synthesizing a desired material, and for many the problems are formidable. Nonspecialists faced with a synthetic problem are not likely to have kept pace with the developments in synthetic chemistry that may well solve their problems and will not have the necessary information in their files.

Thus, we felt that an organized annual review of synthetically useful information would prove beneficial to nearly all organic chemists, both specialist and nonspecialist in synthesis. It should help relieve some of the information-storage burden of the specialist and should enable the nonspecialist who is seeking help with a specific problem to become rapidly aware of recent synthetic advances. Ideally also, it should appear as promptly as possible after the close of the abstracting period. This year we have placed particular emphasis on keeping the abstracts as concise as possible, while indicating the generality of the reactions involved. We have tried to combine similar publications into inclusive abstracts, particularly in Chapter I. This practice has allowed us to include a larger number of references without a substantial increase in the book's length.

In producing *Annual Reports in Organic Synthesis*—1981, we have abstracted 48 primary chemistry journals, selecting useful synthetic advances. We have tried to present the information in an organized manner, emphasizing rapid visual retrieval. Only the common journals received by our libraries have been abstracted. Any journal received after March 1, 1982 will be covered in the next volume. We have also exercised selectivity in choosing which papers to abstract. Our general guidelines have been to include all reactions and methods that are new, synthetically useful, and reasonably general. Each entry is comprised primarily of structures, accompanied by very few comments. The purpose of this emphasis is to aid the reader in scanning the book. The mind is capable of absorbing a whole picture in an instant, but is considerably slowed by having to read sentences. If the pictures presented catch the reader's interest, he or she should then seek details from the original paper.

For the sixth year we have included a principal author index to aid the user. No subject index is included because to do so would greatly increase both the cost of the book and the lead time for publication. Instead, we have chosen to use an extensive table of contents. Chapters I–III are organized by reaction type and constitute a major part of the book. The organization of these sections is self-explanatory; thus, there should be no difficulty in locating a new method of oxidation or a new cyclo-propanation procedure. Chapter IV deals with methods of synthesizing heterocyclic systems and Chapter V covers the use of new protecting groups. Chapter VI is divided into three main parts and covers those synthetically useful transformations that do not fit easily into the first three chapters. The first part deals only with functional group synthesis; the second covers ring expansion and contraction; and the third involves useful multistep sequences, the individual steps of which may be well known. Future volumes of this series will maintain the present table of contents as much as possible. If no entry is found for a particular section, the last volume in which one appears will be cited in the table of contents.

Any undertaking of this type involves a series of compromises. We have chosen to emphasize reasonable cost, rapid publication, and rapid visual retrieval of information at the admitted expense of detail and beauty.

The arduous task of drawing the multitude of structures appearing in this review was carried out by Ms. Audrey Maakestad and Ms. Katy Krupa. We thank them very much for their efforts. We also thank William Bruder, Dr. Arlene Courtney, Sharon Fricke, Lydia Milne, Dr. Forrest Sheffy, and Ron Wilde for aid in proof-reading the manuscript.

L. G. WADE, JR.
MARTIN J. O'DONNELL

JOURNALS ABSTRACTED

Accounts of Chemical Research
Acta Chemica Scandinavica
Aldrichimica Acta
Angewandte Chemie International Edition in English
Australian Journal of Chemistry
Bulletin of the Chemical Society of Japan
Bulletin de Societes Chimiques Belges
Bulletin de la Société Chimique de France
Canadian Journal of Chemistry
Chemical Communications
Chemical and Pharmaceutical Bulletin
Chemical Reviews
Chemical Society Reviews
Chemische Berichte
Chemistry and Industry
Chemistry Letters
Collection of Czechoslovakian Chemical Communications
Comptes Rendus Hebdomadaires de Seances de l'Academie des Sciences (C)
Doklady Chemistry
Gazzetta Chimica Italiana
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Indian Journal of Chemistry
Israel Journal of Chemistry
Journal of the American Chemical Society
Journal of Chemical Research
Journal of the Chemical Society (Perkin I)
Journal of the Chemical Society (Perkin II)
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Recueil des Travaux Chimiques des Pays-bas
Russian Chemical Reviews
Steroids
Synthesis
Synthetic Communications
Tetrahedron
Tetrahedron Letters
Topics in Current Chemistry
Zeitschrift für Chemie

GLOSSARY OF ABBREVIATIONS

Ac	acetyl	MCPBA	<i>meta</i> -chloroperbenzoic acid
AIBN	Azobisisobutyronitrile	Me	methyl
Ar	aryl	MEM	β -methoxyethoxymethyl
9-BBN	9-borabicyclo[3.3.1] nonane	Ms	methanesulfonyl
BOC (<i>t</i> -Boc)	<i>t</i> -butoxycarbonyl	NBS	N-bromosuccinimide
Bu	Butyl	NCS	N-chlorosuccinimide
Bz	benzyl	Ni (R)	Raney Nickel
Cbz	Benzoyloxycarbonyl	Ⓟ	polymeric backbone
COD	1,5-cyclooctadiene	PCC	pyridinium chlorochromate
Cp	cyclopentadienyl	Ph	phenyl
DBN	1,5-Diazabicyclo[4.3.0] non-3-ene	(Phen)	1,10-phenanthroline
DBU	1,5-diazabicyclo[5.4.0] undecene-5	Phth	phthaloyl
DCC	dicyclohexylcarbodiimide	PPA	polyphosphoric acid
DDQ	2,3-dichloro-5,6-dicyanobenzoquinone	PPE	polyphosphate ester
DEAD	diethyl azodicarboxylate	Pr	propyl
DIBAL (DIBAL)	diisobutylaluminum hydride	Py, pyr	pyridine
DMAD	dimethyl acetylenedicarboxylate	Q ⁺	quaternary ammonium
DMAP	4-N,N-dimethylaminopyridine	RT	room temperature
DME	1,2-dimethoxyethane	Tf	trifluoromethane sulfonate
DMF	dimethylformamide	TFA	trifluoroacetic acid
DMSO	dimethyl sulfoxide	TFAA	trifluoroacetic anhydride
E ⁺	general electrophile	THF	tetrahydrofuran
Et	ethyl	THP	tetrahydropyran
Hex	hexyl	TMEDA	tetramethylethylenediamine
HMPA, HMPT	hexamethylphosphoramide (hexamethylphosphoric triamide)	TMP	2,2,6,6-tetramethylpiperidine
h ν	irradiation with light	TMS	trimethylsilyl
KAPA	potassium 3-aminopropylamide	Ts, Tos	<i>p</i> -toluenesulfonyl
L	triphenylphosphine ligand	Z	benzyloxycarbonyl; also used for electron-withdrawing groups such as -CN, -COOR, etc.
LAH	lithium aluminum hydride	Δ	heat
LDA	lithium diisopropylamide	ϕ	phenyl
LICA	lithium isopropylcyclohexylamide	18-C-6	18-crown-6

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I

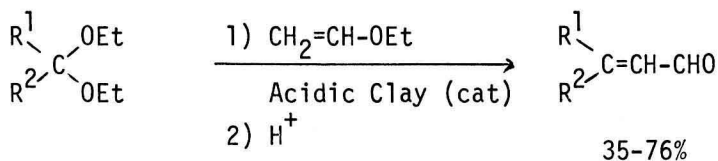
CARBON—CARBON BOND FORMING REACTIONS

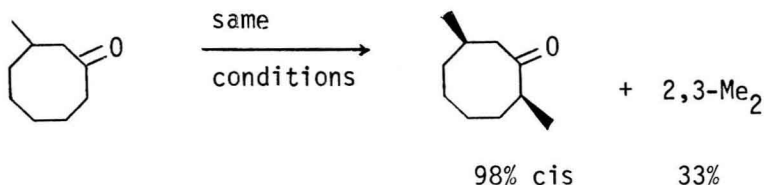
I.A. Carbon-Carbon Single Bonds

(see also: I.E, I.F, I.G).

I.A.1. Alkylation of Aldehydes, Ketones and Their Derivatives

I.A.1-1 D. Fishman, J. T. Klug and A. Shani, Synthesis, 137 (1981); J. A. Miller and G. Zweifel, J. Amer. Chem. Soc., 103 6217 (1981).

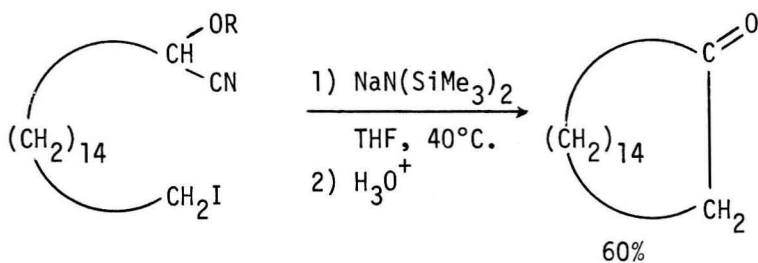




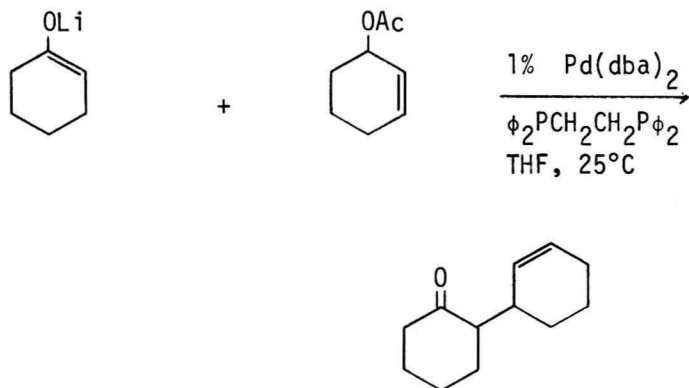
I.A.1-5 R. Gompper and H. H. Vogt, Chem. Ber., 114, 2866, 2884 (1981); A. S. Narula, Tetrahedron Lett., 22, 4119 (1981).

"Substituent Effects in the Methylation of Enolate Anions."

I.A.1-6 J. Tsuji et al, Tetrahedron Lett., 22, 1359, 1363, 2651 (1981).



I.A.1-7 J. C. Fiaud and J. L. Malleron, Chem. Commun., 1159 (1981).



55%

(α -alkylation)

dba = dibenzylideneacetone

I.A.1-8 G. A. Russell, B. Mudryk and M. Jawdosiuk, J. Amer. Chem. Soc., 103, 4610 (1981).

