

annual reports in organic synthesis—1980

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

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edited by

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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. He 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 most likely not 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 nearly to all organic chemists, both specialist and nonspecialist in synthesis. It should help relieve some of the information-storage burden of the specialist and should aid 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*—1980, we have abstracted 46 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, 1980 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 should then seek details from the original paper.

For the fifth 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, and there should be no difficulty in locating a new method of oxidation or a new cyclopropanation procedure. Chapter IV deals with methods of synthesizing heterocyclic systems. Chapter V covers the use of new protecting groups and is also self-explanatory. 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 part covers ring expansion and contraction, and the third part 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. Rosalie Jaramillo and Ms. Katy Krupa. We thank them very much for their efforts. We also thank William Bruder, Jon Lawson, Kathryn Lutomski, and James McKearin for aid in proofreading the manuscript.

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

JOURNALS ABSTRACTED

Accounts of Chemical Research
Acta Chemica Scandinavica
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
Fortschritte der Chemischen Forschung
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Indian Journal of Chemistry
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Journal of the Chemical Society (Perkin I)
Journal of the Chemical Society (Perkin II)
Journal of General Chemistry (USSR)
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Journal of Organic Chemistry
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Russian Chemical Reviews
Steroids
Synthesis
Synthetic Communications
Tetrahedron
Tetrahedron Letters
Zeitschrift für Chemie

GLOSSARY OF ABBREVIATIONS

Ac	acetyl	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> -butyloxycarbonyl	NBS	N-bromosuccinimide
Bu	butyl	NCS	N-chlorosuccinimide
Bz	benzyl	Ni (R)	Raney Nickel
Cbz	Benzyloxycarbonyl	(P)	polymeric backbone
Cp	cyclopentadienyl	Ph	phenyl
DBU	1,5-diazabicyclo[5.4.0] undecene-5	(Phen)	1,10-phenanthroline
DCC	dicyclohexylcarbodiimide	Phth	phthaloyl
DDQ	2,3-dichloro-5,6-dicyanobenzoquinone	PPA	polyphosphoric acid
DEAD	diethyl azodicarboxylate	PPE	polyphosphate ester
DIBAL (DIBAL)	diisobutylaluminum hydride	Pr	propyl
DMAD	dimethyl acetylenedicarboxylate	Py, pyr	pyridine
DME	1,2-dimethoxyethane	RT	room temperature
DMF	dimethylformamide	Tf	trifluoromethane sulfonate
DMSO	dimethyl sulfoxide	TFA	trifluoroacetic acid
E+	general electrophile	TFAA	trifluoroacetic anhydride
Et	ethyl	THF	tetrahydrofuran
Hex	hexyl	THP	tetrahydropyranyl
HMPA, HMPT	hexamethylphosphoramide (hexamethylphosphoric triamide)	TMEDA	tetramethylethylenediamine
$h\nu$	irradiation with light	TMP	2,2,6,6-tetramethylpiperidine
L	triphenylphosphine ligand	TMS	trimethylsilyl
LAH	lithium aluminum hydride	Ts, Tos	<i>p</i> -toluenesulfonyl
LDA	lithium diisopropylamide	Z	benzyloxycarbonyl; also used for electron-withdrawing groups such as -CN, -COOR, etc.
LICA	lithium isopropylcyclohexylamide	Δ	heat
MCPBA	<i>meta</i> -chloroperbenzoic acid	ϕ	phenyl
		18-C-6	18-crown-6

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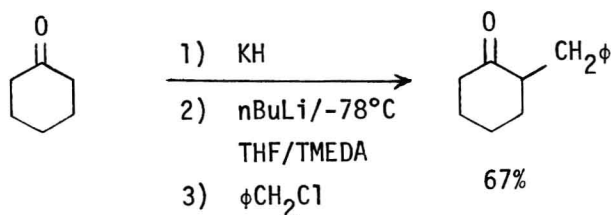
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CARBON – CARBON BOND FORMING REACTIONS

I.A. Carbon-Carbon Single Bonds (See also: I.E., I.F, I.G).

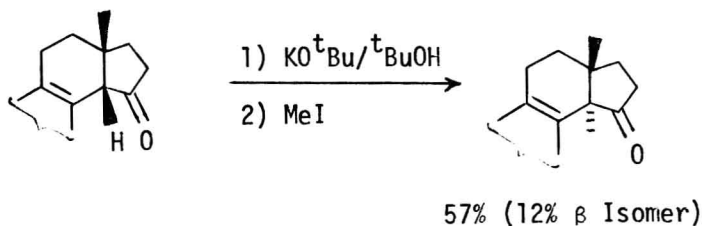
I.A.1. Alkylation of Aldehydes, Ketones and Their Derivatives
(See also: I.G.1)

I.A.1-1 J. S. Hubbard and T. M. Harris, J. Amer. Chem. Soc., 102, 2110 (1980).

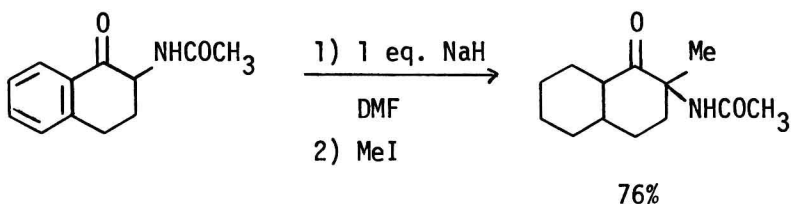


Via α,α' -Dianion.

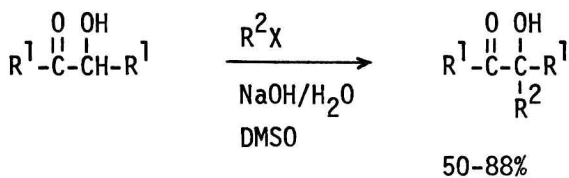
I.A.1-2 J. R. Bull and J. Floor, Chem. Commun., 270 (1980).



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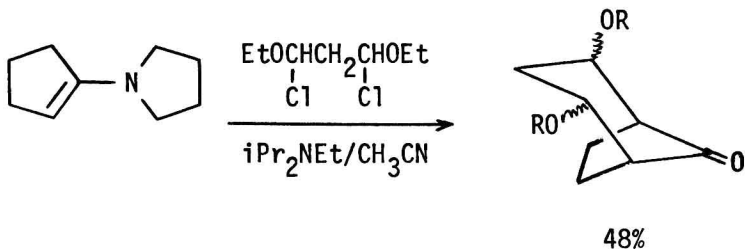


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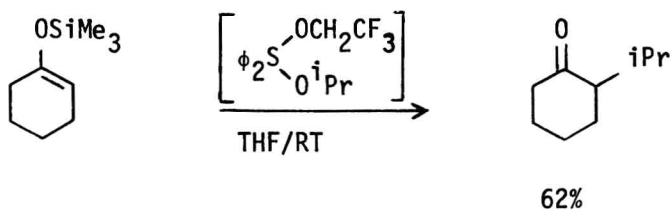


Alkaline peroxide oxidation of product yields
ketone (R^1COR^2)

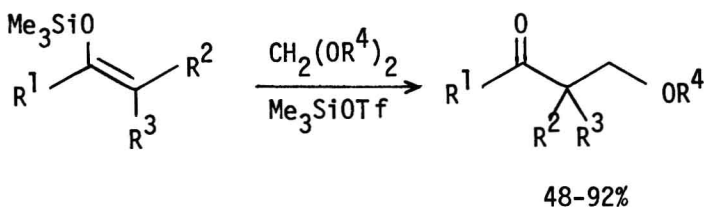
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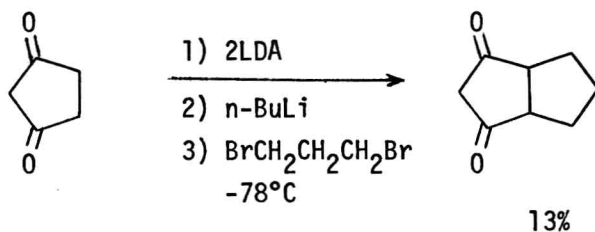
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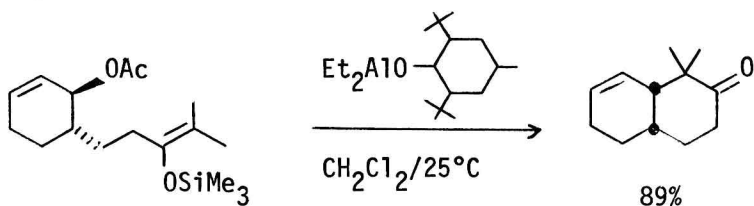
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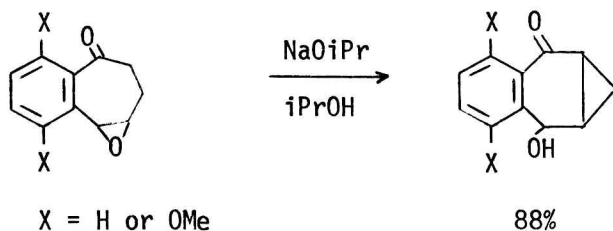
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I.A.1-9 K. Oshima et al., Bull. Chem. Soc. Jpn., **53**, 2050 (1980).



I.A.1-10 Z. Kotkowska-Machnik and J. Zakrewski, Tetrahedron Lett., **21**, 2091 (1980).



I.A.1-11 G. Stork and E. W. Logusch, J. Amer. Chem. Soc., **102**, 1218, 1219 (1980).

