annual reports in organic synthesis–1992

edited by Philip M. Weintraub, Kenneth Turnbull,
Daniel M. Ketcha, and Raymond Gross

academic press, inc.
Harcourt Brace Jovanovich, Publishers
San diego new york boston
London sydney tokyo toronto

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ACADEMIC PRESS, INC.
Harcourt Brace Jovanovich, Publishers
San Diego New York Boston London Sydney Tokyo Toronto

Academic Press Rapid Manuscript Reproduction

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Academic Press, Inc.
1250 Sixth Avenue, San Diego, California 92101-4311

United Kingdom Edition published by
Academic Press Limited
24–28 Oval Road, London NW1 7DX

Library of Congress Catalog Number: 71-167779

International Standard Book Number: 0-12-040822-8

PRINTED IN THE UNITED STATES OF AMERICA
92 93 94 95 96 97 BB 9 8 7 6 5 4 3 2 1

annual reports in organic synthesis - 1992

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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, synthetic chemists must read a large number of journals and must organize and index what they read 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. Non specialists faced with the synthetic problem are not likely to have kept pace with the developments in synthetic chemistry that may well solve their problems, and they 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 specialists and non specialists in synthesis. It should help relieve some of the information storage burden of the specialist and should enable the non specialist who is seeking help with a specific problem to rapidly become aware of recent synthetic advances. Ideally also, it should appear as promptly as possible after the close of the abstracting period. As in the past years, 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 Chapters I and IV. This practice has allowed us to include a larger number of references without a substantial increase in the book's length. It should be noted that where multiple references are included in the abstract, the first mentioned refers to the equation presented. The

remaining references are similar but not identical. To further aid the readers, we have tried to separate less similar references from those represented by the graphic by the phrase "see also:". We have allowed for two such separations per graphic. One more change was instituted this year: we have omitted the year from each reference as they are presumably all 1991. The references from 1990 (from journals received our cutoff date) are noted appropriately.

In producing *Annual Reports in Organic Chemistry–1992* we have abstracted 47 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 February 1, 1991 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. 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.

We have included an author index based on the name of the senior author or sometimes the first author. No subject index is included because we feel the Table of Contents serves that function. Chapters I–III are organized by reaction type and, hopefully, the organization is self-explanatory; thus, there should be no difficulty in locating a new method of oxidation or a new cyclopropanation procedure. We have split away from Section I.B.3, Other Carbon-Carbon Double Bond Forming Reactions, those reactions in which a vinyl group is transferred. The new Section is I.B.4. Vinylations. Chapter IV deals with methods of synthesizing heterocyclic systems. Where fused ring systems bearing multiple heterocyclic rings are synthesized, we have chosen to categorize the heterocyclic system by the ring formed in the reaction. Chapter V covers the use of new protecting groups. Chapter VI covers those synthetically useful transformations that do not fit easily into the first three chapters. Chapter VII has been divided into sections in order to help the reader to quickly find a review on a specific topic. Heterocyclic reviews may be found in Chapter IV.

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

The task of typing and preparing the graphics was done by Marcia Ketcha and the editors. We hope the readers will forgive the inevitable typos and other minor "glitches"

Senior and Contributing Editor
Philip M. Weintraub

Contributing Editors
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JOURNALS ABSTRACTED

Accounts of Chemical Research
Acta Chemica Scandinavia
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Tetrahedron Letters
Topics in Current Chemistry
Zeitschrift fur Chemie
Zeitschrift fur Naturforschung, Teil B

GLOSSARY OF ABBREVIATIONS

9-BBN 9-borabicyclo[3.3.1]-nonane
18-Cr-6 8-C-6 18-crown-6
AA amino acid
Ac acetyl
acac acetonylacetone
ad adamantanyl
AIBN azobisisobutyronitrile
An *p*-anisyl
aq aqueous
Ar aryl
BDPP (2*R*, 4*R*) or (2*S*, 4*S*) 2,4-bis(diphenylphosphino)-pentane
BINAP =œ DINAP 2,2'-bis-(diphenyl-phosphino)-1,1'-binaphthyl
Bn benzyl
Boc *t*-butyloxycarbonyl
BOM benzyloxymethyl
BPPM *t*-butoxycarbonyl-4-(diphenylphosphino)-2-[(diphenyl-phosphino)-methyl]pyrrolidine
bpy bipyridyl
BQ benzoquinone
BSA bovine serum albumin
BSA *N,O*-bis-silylacetamide
Bt 1- or 2-benzotriazolyl
BTMA benzyltrimethyl ammonium
Bu butyl
Bz benzoyl
CAN ceric ammonium nitrate
cat. catalyst
Cbz benzyloxycarbonyl
cod 1,5-cyclooctadiene
cot cyclooctatriene
Cp cyclopentadienyl
CRA complex reducing agent
CSA camphor sulfonic acid
CTAB cetyl trimethyl-ammonium bromide
D heat
d day
DABCO 1,4-diazabicyclo[2.2.2]-octane
DAST diethylaminosulfur trifluoride
dba dibenzylidene acetone
DBU 1,5-diazabicyclo[5.4.0]-undec-5-ene
DCA 9,10-dicyanoanthracene
DCB dichlorobenzene
DCC dicyclohexylcarbodiimide
DCE 1,2-dichloroethane
DDQ 2,3-dichloro-5,6-dicyano-benzoquinone
de d.e. diastereomeric excess
DEAD diethyl azodicarboxylate
DET diethyl tartrate
DIBAH DIBAL diisobutyl-aluminum hydride
DIOP 2,3-*O*-isopropylidene-2,3-dihydroxy-1,4-bis-(diphenyl-phosphino)-butane
DMAD dimethyl acetylene dicarboxylate
DMAP dimethylamino-pyridine
DME dimethoxyethane
DMF dimethylformamide
DMPS dimethylphenylsilyl
DMPU *N,N'*-dimethyl-propyleneurea
DMSO dimethylsulfoxide
dppb bis(1,4-diphenyl-phosphino)butane
DPPE dppe diphenyl-phosphinoethane

dppf dichloro[1,1'-bis-(diphenylphosphino-ferrocene
DPPP 1,3-(diphenyl-phosphino)propane
dr diastereomeric ratio
ds diastereoselectivity
E general electrophile
ee e.e. enantiomeric excess
Et ethyl
Et_2O diethyl ether
Et_3N triethylamine
EWG electron withdrawing group
F_C ferrocenyl
fl flavin
fod 6,6,7,7,8,8,8-heptafluoro-2,2-dimethyl-3,5-octane-dione
FVP flash vapor pyrolysis
Gr graphite
h hours
Hap hydroxyapatite
HDMS 1,1,1,3,3,3-hexamethyldisilazane
HMPA HMPT hexamethyl-phosphoramide
hn irradiation with light
Ipc isopinocamphenyl
L.R. Lawesson's reagent
LAH lithium aluminum hydride
LDA lithium diisopropylamide
liq. liquid
MABR methyl aluminum bis(4-bromo-2,6-di-^{t} butyl-phenoxide)
MCPBA *m*-chloroperbenzoic acid
Me methyl
Mek methyl ethyl ketone
MEM b-methoxyethoxymethyl
Mes mesityl
MMPP magnesium mono-peroxyphthalate
MOM methoxymethyl
MPM methoxy(phenylthio)-methyl
MS molecular sieves
Ms methanesulfonyl
MSA methanesulfonic acid
MV^{2+} methyl viologen
Naph Np naphthyl
NBS *N*-bromosuccinimide
NCS *N*-chlorosuccinimide
NIS *N*-iodosuccinimide
NMO *N*-methylmorpholine-*N*-oxide
NR no reaction
[O] general oxidation
PCC pyridinium chloro-chromate
PDC pyridium dichromate
PEG polyethylene glycol
Ph phenyl
Ph-H benzene
Ph-Me toluene
PLAP porcine liver acetone powder
PMB *p*-methoxybenzyl
PMP *p*-methoxyphenyl
PPA polyphosphoric acid
Pr propyl
psi pounds per square inch
PTC phase transfer catalysis
PTSA *p*-toluenesulfonic acid
pyr pyridine
rac racemic
RaNi Raney nickel
Rf perfluorinated alkyl
rt room temperature
Salen *N,N'*-ethylenebis-(salicylideneiminato)
SEM TEOC b-trimethylsilyl-ethoxymethyl
Sia Siamyl

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TBAB tetrabutyl ammonium bromide
TBAF tetrabutylammonium fluoride
TBDMS TBS *t*-butyldimethylsilyl
TBME *t*-butyl methyl ether
TCNE tetracyanoethylene
TEA triethylamine
TEOC SEM b-trimethylsilylethoxymethyl
Tf trifluoromethanesulfonate
TFA trifluoroacetic acid
TFAA trifluoroacetic anhydride
THF tetrahydrofuran
THP tetrahydropyranyl
TIPS tri-*i*-propylsilyl
TMAO trimethylamin N-oxide
TMEDA tetramethylethylenediamine
TMS trimethylsilyl
TMU tetramethylurea
Tol tolyl
Tos Ts *p*-toluenesulfonyl
TPP Tetraphenylporphyrin
Tr trityl
TT Co(II) Pc tetrabutylammonium cobalt(II) phthalocyanine-5,12,19,26-tetrasulfate
wk week
Z benzyloxycarbonyl
 polymeric support
 US ultrasound

Contents

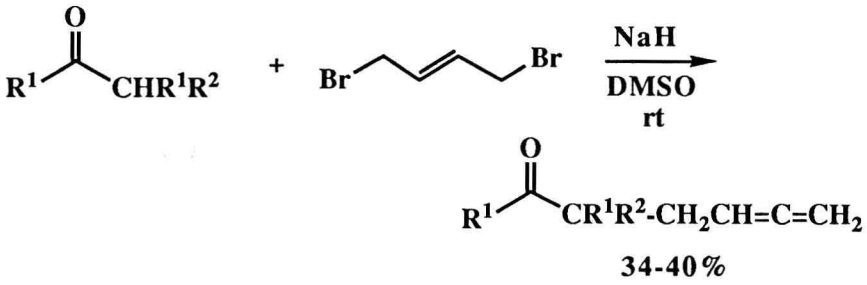
I
CARBON-CARBON BOND FORMING REACTIONS

I.A. Carbon - Carbon Single Bonds

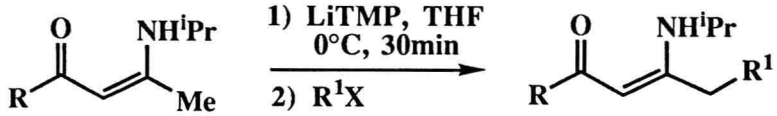
(see also: I.E., I.F., I.G., I.H.)

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

I.A.1-1 Z. Cekovic and R. Matovic, *J. Chem. Soc., Chem. Commun.*, 294; **see also:** P.H. Nelson and J.T. Nelson, *Synthesis*, 192; G. Prasad and P.E. Hanna, *J. Org. Chem.*, **56**, 7188; E.M. Abele et al., *J. Org. Chem. (USSR)*, **26**, 1545 (1990); P. Crotti et al., *Tetrahedron Lett.*, **32**, 7583.



I.A.1-2 G. Bartoli et al., *Synlett*, 229.



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