

COMPREHENSIVE ORGANOMETALLIC CHEMISTRY III

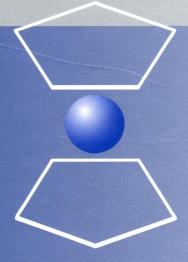
Editors-in-Chief
Robert H. Crabtree & D. Michael P. Mingos

10

Volume

Applications II: Transition Metal Compounds in Organic Synthesis I

Volume Editor Iwao Ojima



COMPREHENSIVE ORGANOMETALLIC CHEMISTRY III

Editors-in-Chief

D. Michael P. Mingos University of Oxford, Oxford, UK

Robert H. Crabtree University of York, York, UK

Volume 10 APPLICATIONS II: TRANSITION METAL COMPOUNDS IN ORGANIC SYNTHESIS 1

Volume Editor

Iwao Ojima

State University of New York at Stony Brook, Stony Brook, NY, USA



AMSTERDAM BOSTON HEIDELBERG LONDON NEW YORK OXFORD PARIS SAN DIEGO SAN FRANCISCO SINGAPORE SYDNEY TOKYO

Elsevier Ltd.

The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, UK

First edition 2007

Copyright © 2007 Elsevier Ltd. All rights reserved

The following article is a US Government work in the public domain and not subject to copyright: 5.12 TECHNETIUM ORGANOMETALLICS

The following material is reproduced with kind permission of Nature Publishing Group: Figure 17 of 12.03 ORGANOMETALLIC DERIVED METALS, COLLOIDS AND NANOPARTICLES

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise without the prior written permission of the publisher

Permissions may be sought directly from Elsevier's Science & Technology Rights Department in Oxford, UK: phone (+44) (0) 1865 843830; fax (+44) (0) 1865 853333; email: permissions@elsevier.com. Alternatively you can submit your request online by visiting the Elsevier web site at http://elsevier.com/locate/permissions, and selecting Obtaining permission to use Elsevier material

Notice

No responsibility is assumed by the publisher for any injury and/or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions or ideas contained in the material herein, Because of rapid advances in the medical sciences, in particular, independent verfication of diagnoses and drug dosages should be made

British Library Cataloguing in Publication Data A catalogue record for this book is available from the British Library

Library of Congress Catalog Number: 2006934994

ISBN-13: 978-0-0804-4590-8 ISBN-10: 0-08-044590-X

For information on all Elsevier publications visit our website at books.elsevier.com

Printed and bound in Spain

06 07 08 09 10 10 9 8 7 6 5 4 3 2 1

Working together to grow libraries in developing countries

www.elsevier.com | www.bookaid.org | www.sabre.org

ELSEVIER BOOK AID Sabre Foundation

Contents

Preface		vii	
Editors-in-Chief		viii	
Editor	Editor of Volume 10		
Contributors to Volume 10			
Conte	Contents of All Volumes		
C-H I	Bond Formation		
10.01	C-H Bond Formation by Asymmetric and Stereoselective Hydrogenation XUMU ZHANG, YONGXIANG CHI, and WENJUN TANG, The Pennsylvania State University, Vniversity Park, PA, USA	1	
10.02	C-H Bond Formation: Through Isomerization K TANAKA, Tokyo University of Agriculture and Technology, Tokyo, Japan	71	
Synth	etic Reactions via C-H Bond Activation		
10.03	Synthetic Reactions via C-H Bond Activation: C-C and C-E Bond Formation M PFEFFER, <i>Université Louis Pasteur, Strasbourg, France</i> , and J SPENCER, <i>James Black Foundation, London, UK</i>	101	
10.04	Synthetic Reactions via C-H Bond Activation: Carbene and Nitrene C-H Insertion HUW M L DAVIES and X DAI, <i>University at Buffalo</i> , <i>Buffalo</i> , <i>NY</i> , <i>USA</i>	167	
10.05	Synthetic Reactions via C-H Bond Activation: Oxidation of C-H Bonds T KITAMURA, Saga University, Saga, Japan, and Y FUJIWARA, Kyushu University, Fukuoka, Japan	213	
C-C I	Bond Formation (Part 1) by Addition Reactions		
10.06	C-C Bond Formation (Part 1) by Addition Reactions: through Carbometallation Mediated by Group 4-7 Metals E NEGISHI and T NOVAK, <i>Purdue University, West Lafayette, IN, USA</i>	251	
10.07	C-C Bond Formation (Part 1) by Addition Reactions: through Carbometallation Catalyzed by Group 8-11 Metals L FENSTERBANK, J-P GODDARD, and M MALACRIA, Université Pierre et Marie Curie, Paris, France	299	
10.08	C-C Bond Formation through Conjugate Addition of C-M to C=C-C=O and C=C-NO ₂ A S C CHAN and F Y KWONG, The Hong Kong Polytechnic University, Kowloon, Hong Kong, People's Republic of China, and G LU, Zhejiang University, Hangzhou, People's Republic of China	369	

vi Contents

	10.09	C-C Bond Formation Through Addition of C-M to C=O, C=N, and C≡N Bonds S KOBAYASHI, M SUGIURA, U SCHNEIDER, R MATSUBARA, J FOSSEY, and Y YAMASHITA, The University of Tokyo, Tokyo, Japan	403
	10.10	Metal-catalyzed Reductive Carbocyclization (C—C, C—C, C—O Bonds) M J KRISCHE and H-Y JANG, <i>University of Texas at Austin, Austin, TX, USA</i>	493
	10.11	C–C Bond Formation through Reaction of CO_2 with C=C and C=C–C=C Z HOU and T OHISHI, <i>RIKEN</i> , <i>Saitama</i> , <i>Japan</i>	537
	10.12	C-C Bond Formation (Part 1) by Addition Reactions: Alder-ene Reaction K M BRUMMOND and J A LOYER-DREW, University of Pittsburgh, Pittsburgh, PA, USA	557
	10.13	C-C Bond Formation (Part 1) by Addition Reactions: Higher-order Cycloadditions P A WENDER, M P CROATT and N M DESCHAMPS, <i>Stanford University</i> , <i>Stanford</i> , <i>CA</i> , <i>USA</i>	603
C-O and C-N Bond Formation			
	10.14	C-O Bond Formation through Transition Metal-mediated Etherification C LEE and R MATUNAS, <i>Princeton University, Princeton, NJ, USA</i>	649
	10.15	C-N Bond Formation through Amination Y TAKEMOTO and H MIYABE, Kyoto University, Kyoto, Japan	695
	С-Е Е	Bond Formation ($E = Si, Sn, B, Te, S, P$)	
	10.16	C–E Bond Formation through Element–Element Addition to Carbon–Carbon Multiple Bonds	725
		M SUGINOME, T MATSUDA, T OHMURA, A SEKI and M MURAKAMI, Kyoto University, Kyoto, Japan	743
	10.17	C–E Bond Formation through Hydrosilylation of Alkynes and Related Reactions Z T BALL, <i>University of California at Berkeley, Berkeley, CA, USA</i>	789
	10.18	C-E Bond Formation through Asymmetric Hydrosilylation of Alkenes T HAYASHI and K YAMASAKI, Kyoto University, Kyoto, Japan	815
	10.19	C-E Bond Formation through Hydroboration and Hydroalumination P J GUIRY, A G COYNE and A-M CARROLL, <i>University College London</i> , <i>Dublin, Republic of Ireland</i>	839
	Index		871