

CONTENTS

FOREWORD	ix
PREFACE	xi
CONTRIBUTORS	xv
PART 1 GREEN REAGENTS	1
1 The Four-Component Reaction and Other Multicomponent Reactions of the Isocyanides	3
<i>Ivar Ugi and Birgit Werner</i>	
2 Carbohydrates as Renewable Raw Materials: A Major Challenge of Green Chemistry	23
<i>Frieder W. Lichtenthaler</i>	
3 Photoinitiated Synthesis: A Useful Perspective in Green Chemistry	65
<i>Angelo Albini</i>	
4 Dimethyl Carbonate as a Green Reagent	77
<i>Pietro Tundo and Maurizio Selva</i>	

PART 2 ALTERNATIVE REACTION CONDITIONS	103
5 Ionic Liquids: “Designer” Solvents for Green Chemistry	105
<i>Natalia V. Plechkova and Kenneth R. Seddon</i>	
6 Supported Liquid-Phase Systems in Transition Metal Catalysis	131
<i>Alvise Perosa and Sergei Zinovyev</i>	
7 Organic Chemistry in Water: Green and Fast	159
<i>Jan B. F. N. Engberts</i>	
8 Formation, Mechanisms, and Minimization of Chlorinated Micropollutants (Dioxins) Formed in Technical Incineration Processes	171
<i>Dieter Lenoir, Ernst Anton Feicht, Marchela Pandelova, and Karl-Werner Schramm</i>	
PART 3 GREEN CATALYSIS AND BIOCATALYSIS	189
9 Green Chemistry: Catalysis and Waste Minimization	191
<i>Roger A. Sheldon</i>	
10 Seamless Chemistry for Sustainability	201
<i>Johan Thoen and Jean Luc Guillaume</i>	
11 Enantioselective Metal Catalyzed Oxidation Processes	219
<i>David StC. Black</i>	
12 Zeolite Catalysts for Cleaner Technologies	231
<i>Michel Guisnet</i>	
13 Acid and Superacid Solid Materials as Noncontaminant Alternative Catalysts in Refining	251
<i>José M. López Nieto</i>	
14 The Oxidation of Isobutane to Methacrylic Acid: An Alternative Technology for MMA Production	265
<i>Nicola Ballarini, Fabrizio Cavani, Hélène Degrand, Eric Etienne, Anne Pigamo, Ferruccio Trifirò, and J. L. Dubois</i>	
15 Biocatalysis for Industrial Green Chemistry	281
<i>Zhi Li, Martin Held, Sven Panke, Andrew Schmid, Renata Mathys, and Bernard Witholt</i>	
INDEX	299