

## CONTENTS

Preface	iii
Contributors	vii
<b>Part I NEW CHEMICAL PROCESS TECHNOLOGIES</b>	
Non-Classical Processes for Petrochemicals in the 1980's <i>Arthur M. Brownstein</i>	3
Selective Oxidation of Propylene by Heterogeneous Catalysis <i>Robert K. Grasselli and James D. Burrington</i>	17
Mobil/Badger Ethylbenzene Process—Chemistry and Catalytic Implications <i>Francis G. Dwyer</i>	39
Catalysis of the Toluene-Methanol Reaction to Form Styrene and Ethylbenzene <i>M. L. Unland and George E. Barker</i>	51
Molecular Shape-Selective Catalysis in Zeolites <i>Clarence D. Chang, William H. Lang, and Weldon K. Bell</i>	73
Calorimetric Studies on a Homogeneous, Olefin Metathesis Catalyst System <i>David M. Singleton and Delbert J. Eatough</i>	95
Acid Catalyzed Oxidation of Toluene to Phenol in the Liquid Phase <i>James E. Lyons, George Suld, Robert W. Shinn, and Chao-Yang Hsu</i>	111
Hydrocarbon Oxidation Mechanisms in Chemical and Biochemical Systems <i>John T. Groves</i>	131
Specific Oxidations: Needs and Direction <i>Benjamin S. Tovrog, Frank Mares, and Steven E. Diamond</i>	139
Polymer Bound Catalysts and Phase Transfer Catalysis: Specific Oxidations by Hydrogen Peroxide <i>Frank Mares and Stephen E. Jacobson</i>	149
Some Industrial Processes Using Borohydride-Reduced Catalysts <i>Robert C. Wade</i>	165

Heterogeneous Catalytic Ozonation <i>G. V. Smith, J. W. Chen, and M. A. Islam</i>	181
<b>Part II NEW SYNTHESIS GAS TECHNOLOGIES</b>	
New Developments in the Synthesis of Light Alcohols <i>Kamil Klier</i>	195
Mechanism of the Homogeneous Hydrogenation of Carbon Monoxide <i>Jerome W. Rathke and Harold M. Feder</i>	219
Methanation Using Nonmetallic Catalysts <i>J. Happel, M. A. Hnatow, and L. Bajars</i>	235
Synthesis of C <sub>2</sub> -Oxygenated Chemicals from Methanol <i>M. Novotny and I. L. Mador</i>	249
Mechanism of a New Process for Methanol Homologation <i>Michael J. Chen and Harold M. Feder</i>	273
Cyanate Compounds and Urea from Nitric Oxide and Synthesis Gas <i>Rudolf J. H. Voorhoeve and L. E. Trimble</i>	289
Rhodium-Catalyzed Hydroformylation with Certain Bidentate Phosphine Ligands <i>Jerry D. Unruh, Jack R. Christenson, O. Richard Hughes and D. A. Young</i>	309
Hydroformylation of Allyl Alcohol as a Route to 1,4-Butanediol <i>Charles U. Pittman, Jr., and William D. Honnick</i>	353
<b>Part III NEW CATALYTIC HYDROGENATION TECHNOLOGIES</b>	
Functional Group Activity of Promoted Raney Nickel Catalysts <i>Stewart R. Montgomery</i>	383
Homogeneous Hydrogenation Catalysts: Industrial Application <i>C. Lassau, G. Hillion, R. Stern, and M. Hellin</i>	411
The Production of Sugar Alcohols (Polyols) by Catalytic Hydrogenation and Their Applications <i>Roland Albert, Axel Strätz, and Gerhard Vollheim</i>	421
The Development of Automated Hydrogenation Apparatus <i>Robert L. Augustine, Galen W. Ewing, and Harry A. Ashworth</i>	441
Hydrogenation of o-Nitroanisole: Effect of Some Variables <i>John R. Kosak</i>	461
Selective Catalytic Hydrogenation of 2,4-Dinitrobenzeneamine to 4-Nitro-1,2-Benzenediamine <i>Robert J. Alaimo and Ronald J. Storrin</i>	473
Index	479