

# CONTENTS

Preface .....	ix
---------------	----

## SPECTROSCOPY

1. Thermal Decomposition of Iron Pentacarbonyl on Titania: Genesis of Fe/TiO <sub>2</sub> Catalysts .....	3
J. Phillips and J. A. Dumesic	
2. Secondary Ion Mass Spectrometry of the Ethylene/Ru(001) Interaction .....	21
L. L. Lauderback and W. N. Delgass	
3. X-Ray Photoelectron Spectroscopy of Cobalt Catalysts: Correlation with Carbon Monoxide Hydrogenation Activities .....	39
D. G. Castner and D. S. Santilli	
4. Modifications of Surface Reactivity by Structured Overlayers on Metals .....	57
Robert J. Madix	
5. X-Ray Absorption Fine Structure, Mössbauer, and Reactivity Studies of Unsupported Cobalt-Molybdenum Hydrotreating Catalysts .....	71
Bjerne S. Clausen, Henrik Topsøe, Roberto Candia, and Bruno Lengeler	
6. Magnetic Resonance Studies of Metal Deposition on Hydrotreating Catalysts and Removal with Heteropolyacids .....	91
B. G. Silbernagel, R. R. Mohan, and G. H. Singhal	
7. Applications of High-Resolution <sup>13</sup> C-NMR and Magic-Angle Spinning NMR to Reactions on Zeolites and Oxides .....	101
Eric G. Derouane and Janos B. Nagy	
8. The Role of Oxygen Ions in the Partial Oxidation of Hydrocarbons: Electron-Proton Resonance and Activity Measurements .....	127
Jack H. Lunsford	

## ZEOLITE CHARACTERIZATION

9. The Future and Impact of Quantum Mechanical Calculations in the Description and Characterization of Zeolites .....	145
Paul G. Mezey	
10. The Preparation and Characterization of Aluminum-Deficient Zeolites .....	157
Julius Scherzer	
11. Aluminum Distributions in Zeolites .....	201
Alan W. Peters	
12. Factors Affecting the Synthesis of Pentasil Zeolites .....	219
Zelimir Gabelica, Eric G. Derouane, and Niels Blom	
13. Combined Physical Techniques in the Characterization of Zeolite ZSM-5 and ZSM-11 Acidity and Basicity .....	253
Jacques C. Vedrine, Aline Auroux, and Gisèle Coudurier	
14. Structure-Selectivity Relationship in Xylene Isomerization and Selective Toluene Disproportionation .....	275
D. H. Olson and W. O. Haag	

MICROSCOPY AND OTHER NOVEL METHODS

15.	<b>Analytical Electron Microscopy of Heterogeneous Catalyst Particles</b> . . . . .	311
	C. E. Lyman	
16.	<b>Single-Particle Diffraction, Weak-Beam Dark-Field, and Topographic Images of Small Metallic Particles in Supported Catalysts</b> . . . . .	335
	M. J. Yacaman	
17.	<b>The Use of Scanning Transmission Electron Microscopes to Study Surfaces and Small Particles</b> . . . . .	353
	J. M. Cowley	
18.	<b>Atomic Number Imaging of Supported Catalyst Particles by Scanning Transmission Electron Microscope</b> . . . . .	367
	M. M. J. Treacy	
19.	<b>NMR Techniques for Studying Platinum Catalysts</b> . . . . .	385
	Harold T. Stokes	
20.	<b>Photoacoustic Spectroscopy of Catalyst Surfaces</b> . . . . .	399
	E. M. Eyring, S. M. Riseman, and F. E. Massoth	
21.	<b>IR Photothermal Beam Deflection Spectroscopy of Surfaces</b> . . . . .	411
	M. J. D. Low, C. Morterra, A. G. Severdia, and J. M. D. Tascon	
22.	<b>Tunneling Spectroscopy of Organometallic Molecules</b> . . . . .	427
	William C. Kaska, Paul K. Hansma, Atiye Bayman, and Richard Kroeker	
23.	<b>The Effect of Particle Size on the Reactivity of Supported Palladium</b> . . . . .	439
	S. Ichikawa, H. Poppa, and M. Boudart	
	<b>Author Index</b> . . . . .	455
	<b>Subject Index</b> . . . . .	455