# Guidelines for Mastering the Properties of Molecular Sieves

Relationship between the Physicochemical Properties of Zeolitic Systems and Their Low Dimensionality

Edited by

### **Denise Barthomeuf**

Université Paris VI Paris, France

### Eric G. Derouane

Université Notre Dame de la Paix Namur, Belgium

### and

## Wolfgang Hölderich

BASF Ludwigshafen, Federal Republic of Germany

Fachbereich Materialwissenschaft der Techn. Hochschule Darmstadt

Inv.-Nr.: 65

Plenum Press New York and London Published in cooperation with NATO Scientific Affairs Division

#### CONTENTS

#### ORIENTATION OF CHEMICAL PROPERTIES BY DIRECT SYNTHESIS OF MOLECULAR SIEVES Effects of substitution in SAPO-n frameworks on their properties as acid catalysts ..... 1 M. Mertens, J.A. Martens, P.J. Grobet, P.A. Jacobs Zeolite synthesis and crystal tailoring ..... 53 F. Fajula New mobilizing and templating agents in the synthesis of crystalline microporous solids ..... 69 J.L. Guth, P. Caullet, A. Seive, J. Patarin, F. Delprato $^{13}$ C- and $^{129}$ Xe-NMR study of the role of the tetraalkylammonium cations in the synthesis of high-silica zeolites ..... 87 Q. Chen, J.B. Nagy, J. Fraissard, J. El Hage-Al Asswad, Z. Gabelica, E.G. Derouane, R. Aiello, F. Crea, G. Giordano, A. Nastro Promoter effects on phase growth in aluminophosphate and silicaluminophosphate gel systems ..... 95 R. Szostak CHARACTERISATION OF STRUCTURAL AND PHYSICOCHEMICAL PROPERTIES OF ZEOLITIC SYSTEMS Recent advances in techniques for characterizing zeolite 99 structures ..... D.E.W. Vaughan, M.M.J. Treacy and J.M. Newsam Recent progress in the understanding of chemical properties J.C. Vedrine A. Alberti, G. Gottardi, T. Lai Solid state ion exchange - Phenomenon and mechanism ...... 157 H.G. Karge, V. Mavrodinova, Z. Zheng, H.K. Beyer STATIC AND DYNAMIC PARAMETERS IN ADSORPTION AND CATALYSIS IN ZEOLITES Temperature dependence of the mobility of molecules sorbed in type A E. Cohen de Lara, R. Kahn

NMR-studies of molecular motion of hydrocarbons in different	100
H.T. Lechert, W.D. Basler, M. Jia	183
Zeolitic heteropolyoxometalates J.B. Moffat, G.B. Mc Garvey, J.B. Mc Monagle, V. Nayak, H. Nishi	193
LOCALIZED AND OVERALL PROPERTIES RELATED TO THE NATURE AND STRUCT ORGANIZATION OF THE FRAMEWORK ATOMS	JRAL
On lattice dynamics, stability and acidity of zeolites R.A. Van Santen, B.M.H. Van Beest, A.J.M. de Man	201
Confinement effects in sorption and catalysis by zeolites E.G. Derouane	225
Cooperative and localised effects in catalysis over zeolites J. Dwyer	24 1
Long range versus short range interactions in zeolites $\mathbb{R}_{\mathbf{x}}$ W.J. Mortier, R. Vetrivel	263
Acid function in zeolites : recent progressJ.A. Rabo, G.J. Gajda	273
Directing activity and selectivity of large pore acid zeolites through the control of their physicochemical properties A. Corma	299
ORIENTATION OF THE PATH OF REACTIONS (CATALYSIS, ADSORPTION) BY CHEMICAL OR OTHER GEOMETRIC OR NON GEOMETRIC EFFECTS	
Is the shape selectivity always responsible for the orientation of, the reaction path in zeolite catalysis ?	319
Factors influencing the selectivity of hydrocracking in zeolitesJ. Weitkamp, S. Ernst	343
Hydroisomerization and hydrocracking of alkanes.6. Influence of the pore structure on the selectivity of Pt-zeolite G. Giannetto, F. Alvarez, F.R. Ribeiro, G. Perot, M. Guisnet	355
The structural elements of faujasite and their impact on cracking selectivity A.W. Peters, W.C. Cheng, M. Shatlock, R.F. Wormsbecher, E.T. Habib Jr.	365
OVERVIEW OF THE WORKSHOP	
Relationship between the physicochemical properties of zeolitic systems and their low dimensionality E.G. Derouane	373
DISCUSSION REPORTS	
Orientations of Chemical Properties by direct synthesis of molecular sieves D.E.W. Vaughan, R.M. Szostak	381

х

Characterisation of structural and physico-chemical properties of zeolitic systems H.G. Karge, J.B. Nagy	387
Static and dynamic parameters in adsorption and catalysis in zeolites L.V.C. Rees, M.S. Spencer	395
Localized and overall properties related to the nature and the structural organization of the framework atoms D. Barthomeuf, A. Corma	403
Orientation of the path of reactions (catalysis, adsorption) by chemical or other geometric or non geometric effects A. Peters, F. Raatz	409
Participants	415
Index	419

•

•

.