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**PARTICLE SYNTHESIS AND PROPERTIES OF ZEOLITE CATALYSTS
FOR SYNTHESIS GAS-GASOLINE CONVERSION**

Final Report for the Period February 18, 1981–February 17, 1984

By
Glenn W. Dodwell
L. B. Sand

June 15, 1984

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Worcester Polytechnic Institute
Worcester, Massachusetts

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Particle Synthesis and Properties of Zeolite Catalysts
for Synthesis Gas-Gasoline Conversion

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ABSTRACT

Conventional Shultz-Flory catalysts suffer from the inherent non-selective product distributions of Shultz-Floryian kinetics. Development of the Mobil M technology is the first major breakthrough in synthetic fuel technology in 5 decades. To utilize the Mobil M technology, synthesis gas produced from the gasification of coal must first be converted to methanol. The high pressures and/or high recycle ratios necessary because of the thermodynamics of the methanol synthesis reaction, make the overall cost of this approach prohibitive in today's economy. The logical extension of the Mobil M technology is to use bifunctional Pentasil based catalysts to provide a single reactor route from synthesis gas to high octane gasoline. Various methods exist to incorporate the CO reduction function with the Pentasil zeolite. The direct synthesis approach which has been largely overlooked by investigators to date, will be emphasized in this research.

TABLE OF CONTENTS

	Page
LIST OF TABLES	vi
LIST OF FIGURES	viii
I. INTRODUCTION	1
A. General	1
B. Objectives of Study	8
II. LITERATURE REVIEW	10
A. Molecular Sieve Zeolites	10
1) Zeolite Synthesis	10
a) The Mechanism of Zeolite Crystallization	11
b) The Role of Organic Molecules in Molecular Sieve Synthesis	40
2) Structure of Zeolites	64
3) Classification of Zeolites	67
B. Zeolite ZSM-5	70
1) Structure of Zeolite ZSM-5	70
2) Synthesis of ZSM-5	76
3) Properties and Uses of Zeolite ZSM-5	79
a) Adsorption	79
b) Ion-Exchange	81
c) Catalytic Properties and Surface Chemistry	83

4) ICI Zeolites	87
a) Zeolite EU-1	87
b) Zeolite EU-2	91
C. The Synthesis of Gasoline	94
1) Fischer-Tropsch Synthesis	94
2) Methanol to Gasoline	100
3) Bifunctional Transition Metal- Zeolite Catalysts	110
III. EXPERIMENTAL METHODS	113
A. Metal Loading	113
B. Integrated Zeolite Research Laboratory	113
1) The LSI-11/23 Computer	116
2) Cahn Balance System - Computer Control.	129
3) The Cahn Balance System - Pneumatics and Operation	134
4) Computerized Micropilot Plant Reactor	139
a) On-Line Analysis	146
5) Computerized X-Ray Diffraction Facility	156
IV. RESULTS AND DISCUSSION	159
A. Computerized Research Facility	159
1) X-Ray Diffraction System	159
2) Cahn Balance System	170
3) Micropilot Plant Reactor System	180
B. Bifunctional Transition Metal- Zeolite Catalysts	192
1) Synthesis of Nu-5	192
2) Synthesis of Sodium Hexamethonium EU-1.	200
3) The Effect of $\frac{(\text{NH}_4)_2\text{O}}{\text{Na}_2\text{O} + (\text{NH}_4)_2\text{O}}$ in the Synthesis of EU-1	206

4) First Synthesis of EU-1 in a Na-Free System	211
5) The Synthesis of EU-2	213
6) Synthesis of ZSM-5	219
C. Catalytic Performance of Bifunctional Catalysts	242
1) Metals Which Non-Dissociatively Adsorb CO	242
2) Metals Which Dissociatively Adsorb CO	252
V. CONCLUSIONS	263
VI. REFERENCES	265
VII. APPENDICES	
A. Appendix A	280
B. Appendix B	310
C. Appendix C	316
D. Appendix D	356
E. Appendix E	372

LIST OF TABLES

	Page
1. Some Sources of Cations, Aluminum and silicon in Zeolite Crystallization	17
2. Clathrate Hydrates	50
3. Zeolite Synthesis in Relation to Cation Environments	56
4. Zeolite Syntheses in Presence of Organic Bases	58
5. Structure Types Synthesized Using TMA	60
6. Organic Zeolite Structure Relationships	60
7. Organic- AlPO_4 Molecular Sieves Structure Relationships	62
8. Secondary Building Units Involved in Zeolite Groups	66
9. Apertures Formed by Rings of Tetrahedra Found in Zeolite Structures	67
10. Structural Classification of Zeolites	68
11. Classification of Zeolites	69
12. Preferred Ranges of Compositions of Reaction Mixtures Which Yield ZSM-5	77
13. Zeolite EU-1 as Freshly Prepared	88
14. Zeolite EU-1 in Calcined Na-H Form	88
15. Sorption Capacity of EU-1 for Molecules of Various Sizes	89

16.	X-Ray Diffraction Lines in EU-2 Family of Zeolites	93
17.	Typical Sorption Results of Molecular Sieve Properties of EU-2	93
18.	Product Distribution From Dehydration of Methanol	93
19.	Distribution of Aromatics Formed in the Conversion of Methanol to Gasoline	104
20.	Operating Conditions for Dual Reactor Fixed Bed Process	108
21.	Composition of Hydrocarbon Products From Fixed Bed Pilot Plant	109
22.	Methanol Equilibrium	111
23.	Peripheral Device and Device State	129
24.	Operational States of Cahn Balance	130
25.	Near Equilibrium Adsorption Capacities for ZSM-5	179
26.	Summary of Parr Autoclave Runs	357
27.	Exploratory Runs	361
28.	Batch Compositions	364

LIST OF FIGURES

	Page
1. Generalized Indirect Coal Liquefaction . . .	3
2. SASOL-Fischer-Tropsch Synthesis	7
3. Mobil M-Gasoline Process	7
4. Schematic Free Energy Relations Between Various Zeolite Phases	15
5. Proposed Mechanism of Dissolution of Silica in Water in the Presence of Hydroxyl Ions	21
6. Variation in Solubility of Silica with Radius of Curvature of Surface	25
7. Polymerization Behavior of Silica	27
8. Steps in the Polymerization of Silica to Cyclic Species	29
9. Bonding Between Silica Particles Through Coordination with Flocculating Metal Cations	31
10. Schematic Representation of the Formation of Zeolite Crystal Nuclei in a Hydrous Gel	33
11. The Framework of Hydrogen-Bonded OH^- ions and H_2O Molecules in $(\text{CH}_3)_4\text{N}^+\cdot\text{OH}^-\cdot 5\text{H}_2\text{O}$	44
12. Polyhedral Oxygen Framework of Hydrogen Bonded OH^- ions and H_2O Molecules in $(\text{CH}_3)_4\text{N}^+\cdot 5\text{H}_2\text{O}$	45
13. Framework Structures with Closest Packed Truncated Octahedra	45
14. Distorted Truncated Octahedron Containing an Axially Disordered $(\text{CH}_3)_4\text{N}^+$ ion	46
15. Ball and Stick Diagram of Polyhedral Framework	47

16.	Ball and Stick Diagram With Atomic Notation Showing Irregular Cages of H_2O Molecules and $(CH_3)_3 N$ Guests	48
17.	View of the "irregular" Cage Looking Down C axis	49
18.	View of the 18-hedron Looking Down C axis	49
19.	Molal Activity Coefficients	51
20.	Extraction of Elements as Tetraalkyl Amine Complex from Na-Hydroxide	54
20.(a and b)	Structure of Zeolites	65
21.(a and b)	Characteristic Configuration and Linkage Within Chains in ZSM-5	71
22.a	Diagram of the (010) Face of ZSM-5 Unit Cell	71
22.b	Diagram of the (100) Face of ZSM-5 Unit Cell	71
23.	Channel Structure in ZSM-5	72
24.	Variation in Al Concentration	73
25.	Variation in Al Concentration	74
26.	Range of Product Compositions for the Crystallization of ZSM-5	78
27.	Effect of Alumina Content on H_2O Sorption of HZSM-5	79
28.	H_2O Adsorption Isotherms for HZSM-5	80
29.	Effect of Aluminum Content of ZSM-5 on Ion-Exchange Capacity	82
30.	Indirect Coal Liquefaction Involving Mobil M Conversion	101
31.	Reaction Path Diagram for Conversion of Methanol to Hydrocarbons	102
32.	Reaction Path for Dimethyl Ether Conversion to Hydrocarbons	103
33.	Zeolite-Catalyzed Methanol Conversion	103

34.	"Rake" Mechanism for Dimethyl Ether Conversions to Hydrocarbons	107
35.	Mobil Methanol to Gasoline Process	108
36.	Schematic of Fluidized Dense Bed Pilot Plant	108
37.	Reaction Mechanism of Methanol over Methanol Synthesis Function	112
38.	Schematic of Integrated Research Facility	114
39.	LSI-11/23 System	117
40.	Memory Organization	118
41.	LSI-11/23 Computer System	124
42.	Cahn 1000 Current to Torque Transducer	126
43.	Signal Conditioning Panel	128
44.	Cahn Balance Computer Interface	131
45.	Schematic of Cahn Balance	133
46.	Computerized Cahn Balance	135
47.	Cahn Balance Pneumatic	137
48.	Schematic of Reactor	140
49.	Reactor Feed Control Panel	142
50.	Brooks Mass Flow Controller	143
51.	Analysis Flow Sequence A	147
52.	Analysis Flow Sequence B	148
53.	Micropilot Plant Reactor	152
54.	General Electric Direct Reading CO Detector	154
55.	Integrated Zeolite Research Laboratory	157
56.	Integrated Zeolite Research Laboratory	158
57.	Cartesian Plot Prepared by 2-dimensional Graphics System	164

58.	First Derivative After Background Noise Removed	166
59.	Amplified (5x) Plot of First Derivative	167
60.	Caliberation Curve	169
61.	Digitally Filtered Rate Curve	173
62.	Direct Linear Regression Fit	177
63.	Linearity of wt.% Octane Adsorbed	178
64.	Curves Describing Shultz-Flory Kinetics	181
65.	Variation in Gasoline Fraction with Polymerization	182
66.	Product Distribution Containing Maximum Gasoline Fraction	184
67.	Ethane Yield Does Not Define Polymerization Probability	186
68.	Propane Yield Does Not Define Polymerization Probability	187
69.	Methane Shows Monotonic Decrease in Yield With Polymerization Probability	188
70.	Typical Output Form For Micropilot Plant Reactor	189
71.	Catalyst After Increasing Temperature	191
72.	XRD Pattern of Na, Pentaerythritol Nu-5	193
73.	SEM of Nu-5 Product	194
74.	SRD Literature Line Pattern for Nu-5	195
75.	SRD Literature Line Patter for Quartz	196
76.	XRD Literature Line Pattern for Tridymite	197
77.	XRD Literature Line Pattern for ZSM-5	198
78.	SEM of α -cristobalite	201
79.	Rate of Crystallization in Na-Hexamethonium EU-1 Synthesis	202
80.	Arrhenious Plot of Rate of Nucleation and Crystallization of EU-1	203

81.	XRD Literature Line Pattern for α-cristobalite	204
82.	SRD Literature Line Pattern for EU-1	205
83.	Crystallization rate of EU-1	208
84.	Morphology of EU-1	209
85.	XRD Pattern for EU-1	210
86.	Crystal Morphologies Obtained in Na-Free System	212
87.	XRD Pattern of EU-2	215
88.	Crystallization Rate Curve for EU-2	216
89.	Crystal Morphologies of EU-2	217
90.	Literature Line Pattern for EU-2	218
91.	Various Crystal Morphologies in Systems Containing Ammonia	224
92.	Incipient Wetness, Aqueous Iron Impregnation of ZSM-5	225
93.	Electron Microprobe Analysis of Cobalt Thoria Catalyst	227
94.	Electron Microprobe Analysis of Cobalt Thoria Catalyst	229
95.	Electron Microprobe Analysis of Cobalt Thoria Catalyst	231
96.	Electron Microprobe Analysis of Cobalt Thoria Catalyst	233
97.	Coke Formation in Zeolites	235
98.	SEM of Bifunctional Catalysts	236
99.	SEM of Bifunctional Catalysts	238
100.	SEM of Bifunctional Catalysts	240
101.	Hydrocarbon Product Distribution Catalyst A	248
102.	Hydrocarbon Product Distribution Catalyst C	249

103.	Hydrocarbon Product Distribution Catalyst D . .	250
104.	Hydrocarbon Product Distribution Catalyst F . .	251
105.	7.5% Nickel ZSM-5	257
106.	5.2% Ruthenium ZSM-5	258
107.	8.7% Iron-ZSM-5 Catalyst	259
108.	78.7% Iron-ZSM-5 Catalyst	260
109.	78.7% Iron-ZSM-5 Catalyst	261
110.	78.7% Iron-ZSM-5 Catalyst	262