TABLE 1. CARBON MOLECULAR SIEVE COMPILATION

SECTION A. - FUNDAMENTALS

SECTION B. - ADSORPTION TECHNOLOGY

SECTION C. - CATALYSIS

Table 1A

Fundamentals

	A TITLE	B AUTHORS/INVENTORS	C INSTITUTION/CORPORATION	D REFERENCE/PATENT
1		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
2	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
3	SECTION A - FUNDAMENTALS OF PREPARATION AND PROPERTIES XXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
4	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX			
5	Mechanism of Enriched Nitrogen produced by Carbon Molecular Sieves	Liu, C	Shanghai Inst. Chem Ind.	Jinshu Rechuli, 7, 46 (1985)
7	Molecular Sieve Carbon and Its Application	Nishino, H	Chem Res Lab., Takeda Chem. Ind., Ltd	Kagaku to Kogyo, 59, 161 (1985)
9	Studies on Equilibrium Adsorption and Desorption Kinetics of Hydrocarbon Mixtures on a Carbon Molecular Sieve	Eichholtz, A., Richter, e., Knoblauch, K., Juentgen, H.	Bergbau-Forsch. G m b H	Chem.-Ing.-Tech., 57, 538 (1985)
12	Carbon Molecular Sieves Produced by the Fixation of Sulfur Surface Complexes	Moreno-Castilla, C., Fernandez-Morales, I., Lopez-Garzon, F.J., Domingo-Garcia, M	Fac. Cienc., Univ. Granada	Ext. Abstr. Program - Bienn. Conf. Carbon, 17th, 241 (1985)
15	Carbon Molecular Sieves	Verma, S.K., Walker, P.L., Jr.	Air Prods. and Chems., Inc.	EP 146909, July 1985
17	Mathematical Modeling of Diffusive Potentials within Carbon Molecular Sieves	Rao, M.B., Jenkins, R.G., Steele, W.A.	Penn. St. Univ.	Ext. Abstr. Program - Bienn. Conf. Carbon, 17th, 114 (1985)
20	from Compressed Air			
22	Porous Carbon Molecular Sieve	NA	Jpn. Oxygen Co., Ltd.	Jpn. Kokai Tokkyo Koho JP59/230637, Dec 1984
24	Porous Carbon as a Molecular Sieve	NA	Jpn Oxygen Co., Ltd.	Jpn. Kokai Tokkyo Koho JP59/230638, Dec 1984
26	Preparation of Carbon Molecular Sieves for Separation of Gas Mixtures	Sindler, B., Spitzer, Z., Ulry, J., Sustova, E.	VSCHT, Prague, Cz.	Sb. Vys. Sk. Chem.-Technol. Praze, Technol. Paliv, D49, 315 (1984)
28	Potential Functions for the Diffusive Motion in Carbon Molecular Sieves	Rao, M.B., Jenkins, R.G., Steele, W.A.	Penn. St. Univ.	Langmuir, 1, 137 (1985)
30	Preparation of Porous Carbonaceous Adsorbents for Sulfur Dioxide Remov	Tamaki, H.	Natl. Res. Inst. Pollut. Resour.	Kogai, 20, 85 (1985)
32	An Adsorption Isotherm of Multi-Site Occupancy Model for Homogeneous Surface	Nitta, T., Shigetomi, T., Kuro-oka, M., Katayama, T.	Fac. Eng. Sci., Osaka Univ.	J. Chem. Eng. Jpn., 17, 39 (1984)
35	Carbon Molecular Sieves and Their Use	Sutt, R.F. Jr.	Calgon Carbon Corp.	EP 119925, Sept. 1984
37	Carbon Molecular Sieves and Their Use	Sutt, R.F. Jr.	Calgon Carbon Corp.	EP 119924, Sept. 1984
39	Production of Structurally Active Carbon from Polyvinyl Formal Molding	Watanabe, F., Kamiya, N., Hasatani, M.	Dept. of Chem. Eng., Nagoya Univ.	Kagaku Kogaku Ronbunshu, 10, 574 (1984)
41	Intracrystalline Diffusion in Zeolites and Carbon Molecular Sieves	Ruthven, D.M.	Dept. of Chem. Eng., Univ. New Brunswick, NB, Canada	AIChE Symp. Ser., 80, 21 (1984)
43	Porous Carbon as a Molecular Sieve for Separation of O2 and N2 in Air	NA	Kuraray Chemical Co., Ltd.	Jpn. Kokai Tokkyo Koho JP 59/45914, Mar 1984
45	Carbon Molecular Sieves Based on Peat	Drozhalina, D.	Nauka i Tekhnika, Moscow	Nauka i Tekhnika, Moscow, 1984
47	Carbon Molecular Sieves	Sutt, R.F. Jr.	Calgon Carbon Corp.	Eur. Pat. Appl. EP 102902 A1, Mar 1984
49	Carbon Molecular Sieves	Spitzer, Z., Hrncir, J., Ulry, J., Sindler, S	Czechoslovakia	Czech. CS 205663 B, 1 Sep 1983
51	Preparation of Molecular Sieving Carbon from Saran Waste. Effect of Adde Amount of Coal Tar Pitch on Separation Ability	Kitagawa, H., Yuki, N.	Natl. Res. Inst. Pollut. Resour.	Kogai, 18, 373 (1983)
54	A Molecular Sieve Carbon Membrane for Continuous Process Gas Separatio	Koresh, J.E., Soffer, A.	Atomic Ener. Comm., Nuc. Res. Cent.-Negev Beer-Sheva, Israel	Ext. Abstr. Program-Bienn. Conf. Carbon, 16th, 367 (1983)
56	Preparation of Molecular Sieve Carbon from Saran Waste. Separation of Hydrocarbon By a Fixed Bed Adsorber	Kitagawa, H., Yuki, N.	Combust. Eng. Dep., Kogai Shigen Kenkyusho	Kogai, 18, 109 (1983)
59	Contribution to Characterization of Microstructure of a Carbon Molecular Sieve Based on Coal	Spitzer, Z., Biba, V., Hrncir, J.	Fuel Res. Inst.	Chem. Zvesti, 37, 23 (1983)
62	Adsorption and Double Layer Charging in Molecular Sieve Carbons in Relation to Molecular Dimensions and Pore Structure	Koresh, J.	Atomic Ener. Comm., Nuc. Res. Cent.-Negev Beer-Sheva, Israel	NRCN-485, INIS Atomindex 1983, 14, Abstr. No. 730988
65				

	A	B	C	D
66	Production and Study of Carbon Adsorbents with Asphaltene Additives	Pokonova, Yu. V., Oleinik, M.S.	Leningrad Tekhnol. Inst.	Khim. Tverd. Topl., 3, 138 (1982)
67				
68	Gas Adsorption on Activated Carbons with Size Distribution of Micropores	Suzuki, M., Sakoda, A.	Inst. Ind. Sci., Univ. Tokyo	J. Chem. Eng. Jpn., 15, 279 (1982)
69				
70	Molecular Sieves - Recent Developments	Mukherjee, P.N., Basu, P.K.	Cent. Fuel Res. Inst.	Chem. Age India, 33, 202 (1982)
71				
72	Effect of Adsorbed Water on Adsorption of Oxygen and Nitrogen on Molecu	Suzuki, M., Doi, H.	Inst. Ind. Sci., Univ. Tokyo	Carbon, 20, 441 (1982)
73	Sieving Carbon			
74				
75	Chromatographic Properties of Carbon Molecular Sieve	Chumburidze, T.A.	USSR	Gaz. Khromatogr., Tbilisi 53-7 (1982)
76				
77	Preparation and Study of Adsorbents Made of Copolycondensates of Aspha	Pokonova, Y.V., Oleinik, M.S., Proskuryakov, V.A.	Leningr. Tekhnol. Inst.	Khim. Tverd. Topl., 5, 100 (1982)
78				
79	Carbon Filaments for Molecular Sieve	NA	Mitsui Coke Kogyo K.K.	Jpn. Kokai Tokkyo Koho Jp 57/129818 A2, Aug 1982
80				
81	The Molecular Sieve Properties of the Carbons Produced from the Pyrolys	Renda, A.N.	FAc. Sci., Univ Ankara	Commun. FAc. Sci. Univ. Ankara, Ser. B., 27, 51 (1981)
82	of the Polyacrylonitrile, Microcrystal Cellulose and Ethylcellulose			
83				
84	Adsorptive Properties of Carbon Molecular Sieve from Saran	Kitagawa, H., Yuki, N.	Natl. Res. Inst. Pollut. Resour.	Carbon, 19, 470 (1981)
85				
86	Preparing Carbon Molecular Sieve	Drozhalina, N.D., Bulgakova, N.A., Volkova, V.G.	Insitute of Peat, academy of Sciences, Belorussian SSR	USSR SU 905104 A1, Feb 1982
87				
88	Preparation of Molecular Sieving Carbon From Coal for removal of Oxygen	Kitagawa, H., Yuki, N.	Natl. Res. Inst. Pollut. Resour.	Nenryo Kyokaishi, 61, 52 (1982)
89	In Air			
90				
91	Molecular Sieve Carbons. Part 3. adsorption Kinetics According to a Surfa	Koresh, J., Soffer, A.	Atomic Ener. Comm., Nuc. Res. Cent.-Negev Beer-Sheva, Israel	J. Chem. Soc., Farad. Trans. 1, 77, 3005 (1981)
92	Barrier Model			
93				
94	Carbon Molecular Sieves: Production from Coal and Application in Gas	Juentgen, H., Knoblauch, K., Harder, K.	Bergbau-Forsch. G.m.b.H.	Fuel, 60, 817 (1981)
95	Separation			
96				
97	Preparation of Molecular Sieving Carbon from Saran Waste. Separation of	Kitagawa, H., Yuki, N.	Natl. Res. Inst. Pollut. Resour.	Kogai, 16, 153 (1981)
98	Air by Pressure Swing Adsorption			
99				
100	Properties of Carbon Molecular Sieves Made from Resinless Chips	Komarov, V.S., Yatsevskaya, M.I., Artemova, T.A.	Inst. Obshch. Neorg. Khim.	Dokl. Akad. Nauk BSSR, 25, 624 (1981)
101				
102	Preparation of Carbon Molecular Sieves from Saran Waste. Separation of	Kitagawa, H., Yuki, N.	Natl. Res. Inst. Pollut. Resour.	Nenryo Kyokaishi, 60, 445 (1981)
103	Butene and Isobutene by a Fixed Adsorber			
104				
105	Preparation and Properties of Molecular Sieve Carbon from Saran Waste	Kitagawa, H., Yuki, N.	Natl. Res. Inst. Pollut. Resour.	Nenryo Kyokaishi, 60, 46 (1981)
106				
107	Preparation of Molecular Sieving Carbon from Saran Waste. Effect of the	Kitagawa, H., Yuki, N.	Natl. Res. Inst. Pollut. Resour.	Nippon Kagaku Kaishi, 3, 438 (1981)
108	Added Amount of Coal Tar Pitch on Pore Size			
109				
110	Carbon Molecular Sieves-Study of the Preparation Molecular Sieves made	Spitzer, Z., Hrncir, J., Uey, J.	Czech.	Sb. Pr. UVP, 39, 228 (1980)
111	of Wood and Brown and Bituminous Coals			
112				
113	Study of Molecular Sieving Carbons. Part 1. Pore Structure, Gradual Pore	Koresh, J., Soffer, A.	Atomic Ener. Comm., Nuc. Res. Cent.-Negev Beer-Sheva, Israel	J. Chem. Soc., Farad. Trans. 1, 76, 24577 (1980)
114	Opening, and Mechanism of Molecular Sieving			
115				
116	Molecular Sieving Range of Pore Diameters of Adsorbents	Koresh, J., Soffer, A.	Atomic Ener. Comm., Nuc. Res. Cent.-Negev Beer-Sheva, Israel	J. Chem. Soc., Farad. Trans. 1, 76, 2507 (1980)
117				
118	Characteristics of the Porous Structure of Carbon Adsorbents from Peat	Drozhalina, N.D.	USSR	Zh. Prikl. Khim., 53, 1442 (1980)
119				
120	Granular Carbonaceous Molecular-Sieve from Coal	NA	Agency of Ind. Sci. and Technol.	Jpn. Kokai Tokkyo Koho Jp 55/71615 May, 1982
121				
122	Gas Separation with Carbonaceous Molecular Sieves	Knoblauch, K., Juentgen, H., Peters, W.	Bergbau-Forsch. G.m.b.H.	Petrochem., 32, 551 (1979)
123				
124	Adsorptive Hydrogen Recovery from Primary Gases	Reichenberger, J., Knoblauch, K., Juentgen, H.	Bergbau-Forsch. G.m.b.H.	Compend.-Dtsch. Ges. Mineraloelwiss. Kohlchem., 78-79, 1046 (197
125				
126	Control of Micropore Diffusivities of Molecular Sieving Carbon By	Chihara, K., Suzuki, M.	Inst. Ind. Sci., Univ. Tokyo	Carbon, 17, 339 (1979)
127	Deposition of Hydrocarbons			
128				
129	Properties of Granulated Charcoal Molecular Sieves Prepared from	Komarov, V.S., Yatsevskaya, M.I., Kalenik, T.A.	Inst. Obshch. Neorg. Khim.	Dokl. Akad. Nauk. BSSR, 23, 828 (1979)
130	Modified Carbon			

	A	B	C	D
131		Inoga, K., Ogino, B	Takeda Chem Ind	Jpn. Kokai Tokkyo Koho JP 53/131989, Nov. 1978
132	Molecular Sieve as a Purging Agent of Organic Compounds of Low Molecula			
133	Weight in Air			
134		Komarov, V S., Yatsevskaya, M I., Gornak, A I.	Inst Obshch Neorg Khim.	Zh Fiz Khim., 52, 2938 (1978)
135	Adsorption and Gas Chromatographic Properties of Carbon Molecular			
136	Sieves Prepared From Wood			
137		Pratsch, F', Juentgen, H.	Bergbau-Forsh G.m.b.H.	Verfahrenstechnik., 12, 369 (1978)
138	New Molecular Sieves from Carbon			
139		Astakhov, V. A., Lukin, V.D., Macharova, L.P.	Belorussk Tekhnol. Inst.	Zh. Prikl Khim., 51, 1733 (1978)
140	Adsorption Equilibrium on Molecular-Sieve Carbons			
141		Savel'eva, L.V., Zamashikin, R.I., Savel'ev, L.N., Dvoretskii, G.V.	USSR	Poluch. Anal. Chist. Veshchestvm 2, 53 (1977)
142	Possibility of Separating Vapor-Air Mixtures on Carbon Molecular Sieves			
143		Juentgen, H., Knoblauch, K., Munzer, H., Schroter, H.J., Zundorf, D.	Bergbau-Forsh. G.m.b.H.	Lon Int Conf Carbon Graphite, 4th Mtg., 1974, Soc Chem Ind., Lond
144	Narrow-Pore Carbon Molecular Sieves from Bituminous Coal			
145		Chihara, K., Suzuki, M., Kawazoe, K	Inst. Ind Sci., Univ. Tokyo	J. Colloid Interface Sci., 64, 584 (1978)
146	Interpretation for the Micropore Diffusivities of Gases in Molecular-			
147	Sieving Carbon			
148		Chihara, K., Suzuki, M., Kawazoe, K.	Inst. Ind. Sci., Univ. Tokyo	AI ChE J., 24, 237 (1978)
149	Adsorption Rate on Molecular Sieving Carbon by Chromatography			
150		Juentgen, H.	Bergbau - Forschung G.m.b.H.	Carbon, 15, 273 (1977)
151	New Applications for Carbonaceous Adsorbents			
152		Drozhelina, N.D., Rakovskii, V.E., Bulgakova, N.O.	Inst. Torfa	Dokl. Akad. Nauk. BSSR, 21, 1097 (1977)
153	Directed Modification of Peat During the Production of Carbon			
154	Molecular Sieves			
155		Moore, S.V., Trimm, D.L.	Dep. Chem Eng., Tewchnol., Imp. Coll.	Carbon, 15, 177 (1977)
156	The Preparation of Carbon Molecular Sieves by Pore Blocking			
157		Boehm, H.P., Warnecke, H.H.	Inst. Anorg. Chem., Univ. Muenchen	Carbon 76, Int. Carbon Conf., Progr., 2nd, 76 (1976)
158	Applicability of the Dubinin Equation to the adsorption on Molecular			
159	Sieve Carbon			
160		Yuki, N.	Agency of Ind. Sci. and Tech.	US 4046709 Sept. 1977
161	Carbonaceous Granular Carbon Molecular Sieve			
162		Nakahara, T., Hirata, M.	Fac. Technol., Tokyo Metrop. Univ.	Mem. Fac. Technol., Tokyo Metrop. Univ., 26, 2471 (1976)
163	Distribution of Adsorptive Potential, Entropy, and Enthalpy of Adsorption			
164	for Ethane-Carbon Molecular Sieve System			
165		Takeuchi, Y., Furuya, E.	Dept. Ind. Chem., Meiji Univ.	J. Chem. Eng. Jpn., 10, 268 (1977)
166	Adsorption Equilibrium for Molecular Sieving Carbon-Non-Aqueous Binary			
167	Liquid Mixtures			
168		Juentgen, H., Knoblauch, K., Reichenberger, J	Bergbau-Forsch. G.m.b.H	Monatsschr. Brau., 30, 27 (1977)
169	Principles of the Adsorptive Production of Pure Nitrogen According to			
170	the Bergbau-Forschung Process			
171		Komarov, V.S., Ermolenko, I.N., Yatsevskaya, M.I., Lyubliner, I.P.	Inst. Obshch. Neorg. Khim.	Zh. Prikl. Khim., 50, 904 (1977)
172	Preparation of arbon Molecular Sieves from Wood and Cellulose fibers and			
173	a Study of their Properties			
174		Juentgen, H.	Bergbauforsch. G.m.b.H.	Staub - Reinhalt. Luft, 36, 281 (1976)
175	principles of Adsorption			
176		Grant, R.J.	Calgon Corp.	U.S. 3955944, May 1976
177	Controlled Selectivity Activated Carbon			
178		Ozawa, S., Kusumi, S., Ogino, Y.	Fac. Eng., Tokyo Univ.	J. Colloid Interface Sci., 56, 83 (1976)
179	Physical Adsorption og Gases At High Pressures. IV. An Improvement of th			
180	Dubinin-Astakhov Adsorption Equation			
181		Yuki, N.	Agen. of Ind. Sci. and Technol.	Jpn. Kokai Jp 50/161485, Dec. 1975
182	Carbon Molecular Sieves from Waste Saran			
183		Siedlewski, J., Malewski, R.	Inst. Chem. Univ. Mikolaja Kopernika	Koks, Smola, Gaz., 20, 208 (1975)
184	Study of the Sieve Properties of Activated Carbons Obtained from			
185	Poly(furfuryl alcohol)			
186		Juentgen, H., Knoblauch, K., Schroeter, H.J.	Bergbau-Forsch. G.m.b.H	Ber. Bunsenges. Phys. Chem., 79, 824 (1975)
187	Diffusion of Gas Mixtures through Bottlenecks as the eRate Determining			
188	Step in Pore Diffusion Through Carbonaceous Materials			
189		Nandi, S.P., Walker, P.L., Jr	Dep. Mater. Sci., Penn. State Univ	Fuel, 54, 169 (1975)
190	Carbon Molecular Sieves for the Concentration of Oxygen from Air			
191		Drozhalina, N.D., Bulgakova, N.O., Volkova, V.G	Inst. Torfa	Zh. Prikl. Khim., 48, 1264 (1975)
192	Carbon Adsorbents with Molecular Sieve Properties Consisting of Peat			
193	and Phenol-Formaldehyde			
194		Timm, D.I.	Air Products and Chemicals, Inc	Brit. GB 1375900, Nov. 1974
195	Selective Gas Adsorbtion on Carbon Molecular Sieves			

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196				
197	Carbon Molecular Sieves for the Concentration of Oxygen from Air	Nandi, S.P., Walker, P.L. Jr	Dept. Mater. Sci., Penn State Univ	Bienn. Conf. Carbon, Ext. Abstr. Prog., 11th, Issue Conf.-730601, 62-3. NTIS 1973
198				
199				
200	Adsorption of Hydrocarbons on Carbon Molecular Sieve. Application of Volume Filling Theory	Nakahara, T., Hirata, M., Omori, T.	Dept. Ind. Chem., Tokyo Metrop. Univ.	J. Chem. Eng. Data, 20, 195 (1975)
201				
202				
203	Molecular Sieve Carbon Adsorbing Agent	Eguchi, Y., Itoga, K., Sawada, T., Nishino, H.	Takeda Chem Ind., Ltd	Jpn. JP 49/37036, Oct. 1974
204				
205	Carbonaceous Molecular Sieve by Heating After Activation	Toda, Y., Yuki, C., Toyoto, S.	Agncy of Ind. Sci. and Technol.	Jpn. JP 49/18555, May 1974
206				
207	Pore Structure and Molecular Sieve Properties of Poly(vinylidene chloride) Carbons	Barton, S.S., Evans, M.J., Harrison, B.H.	R. Mil. Coll. Can	J. Colloid. Interface Sci., 49, 462 (1974)
208				
209				
210	Carbon-Containing Molecular Sieves For the Oxygen-Nitrogen Separation	Muenzer, H., Harbel, H., Koerbaecher, W.	Bergwerksverband G.m.b.H.	Ger. Offen. DE 2305435, 1974
211				
212	Molecular Sieve Properties of Polyvinylidene Chloride Carbons	Barton, S., Evans, M.J., Harrison, B.H.	R. Mil. Coll. Canada	Pore Struct. Prop. Mater., Proc. Int. Symp., RILEM/IUPAC, Mtg. Date 1973, Vol. 4, 179
213				
214				
215	Adsorption of Hydrocarbons on a Carbon Molecular Sieve	Nakahara, T., Hirata, M., Omori, T.	Dept. Ind. Chem., Tokyo Metrop. Univ.	J. Chem. Eng. Data, 19, 310, (1974)
216				
217	Correlation of Adsorption Equilibrium Data of Various Gases and Vapors on Molecular Sieving Carbon	Kawazoe, K., Kawai, T., Eguchi, Y., Itoga, K.	Inst. Ind. Sci., Univ. Tokyo	J. Chem. Eng. Data, 7, 158, (1974)
218				
219				
220	Chromatographic Study of Diffusion in Molecular Sieving Carbon	Kawazoe, K., Suzuki, M., Chihara, K.	Inst. Ind. Sci., Univ. Tokyo	J. Chem. Eng. Data Jpn., 7, 151, (1974)
221				
222	Retention Volumes and Heats of Adsorption of Inorganic and Hydrocarbon Gases on a Carbon	Dolova, I.A., Kiselev, A.V., Yashin, Ya. I.	Mosk. Gos. Univ. im. Lomonosova	Zh. Fiz. Khim., 48, 1256 (1974)
223				
224				
225	Molecular Sieve Effects as Consequences of the Activated Nature of Physical Adsorption	Dubinin, M.M., Nikolaev, K.M., Polyakov, N.S.	Inst. Fiz. Khim.	Kinet. Din. Fiz. Adsorptsii, Tr. Vses. Konf. Teor. Vop. Adsorptsii, 3rd, Mtg. Date 1971, 26. Dubinin, M.M., Ed., "Nauka", Moscow, USSR
226				
227				
228	New Molecular Sieves	Tamura, K., Ohnishi, T., Watanabe, K.		Jpn. Kokai Jp 49/1487, Jan 1974
229				
230	So-Called Carbon Molecular Sieves in Gas Chromatography	Patzelova, V., Kadlec, O., Seidl, P.	J. Heyrovsky Inst. Phys. Chem. Electrochem.	J. Chromatogr. 91, 313 (1974)
231				
232	Adsorption equilibriums of Vapors and Gases on Microporous Adsorbents. III. Correlation of Adsorption Equilibrium Data of Gases on Molecular Sieving Carbon	Kawazoe, K., Kawai, T.	Inst. Ind. Sci., Univ. Tokyo	Seisan-Kenkyu, 25, 5134 (1973)
233				
234				
235				
236	Fibrous Carbon Molecular Sieves	Christner, L.G.	Penn. State Univ.	Diss. Abstr. Int. B 1973, 34, 1177
237				
238	Active Carbon of Selective Adsorption Properties	Grant, R.J.	Calgon Corp.	Ger. Offen. DE 2218903, Oct. 1972
239				
240	Carbon-Containing Molecular Sieves	Muenzner, H., Heimbach, H., Korbacher, W., Peters, W., Juentgen, H., Knoblauch, K., Zuendorf, D.	Bergwerksverband G.m.b.H.	S. African ZA 71/4559, Feb 1972
241				
242				
243	Carbon Spherules by Carbonization of Poly(vinylidene chloride)	Rupberger, W., Oettinger, W., Kaiser, R., Pfitzner, K., Palm, R.	Badische Anilin- und Soda-Fabrik A.-G.	Ger. Offen. DE 2104657, 1972
244				
245	Carbon Molecular Sieves	Fitzer, E., Kalka, J.	NA	Ger. Offen. DE 2055559, 1972
246				
247	Molecular-Sieve Action of Industrial Active Carbons With Different Microporous Structure in Statics and Dynamics of the Adsorption of Vapors of Substances Containing Relatively Large Molecules	Dubinin, M.M., Nikolaev, K.M., Polyakov, N.S.	USSR	Adsorbenty, Ikh Poluch., Svoistva Primen., Tr. Vses. Soveshch. Adsorbentam, 3rd, Mtg. Date 1969, 179. Dubinin, M.M., Ed., "Nauka" Leningrad. Otd.: Leningrad, USSR 1971
248				
249				
250				
251	Adsorption Equilibrium on Carbon Molecular Sieves	Kawazoe, K., Kawai, T., Eguchi, Y., Astakhov, V.A.	Inst. Ind. Sci., Univ. Tokyo	Kagaku Kogaku, 35, 1006 (1971)
252				
253	Adsorption Equilibriums on Microporous adsorbents. II. Adsorption Properties of Molecular-Sieving Carbon	Kawazoe, K., Kawai, T., Astakhov, V.A.	Inst. Eng. Res. Inst., Univ. Tokyo	Seisan-Kenkyu, 22, 491 (1970)
254				
255				
256	Carbon Molecular Sieve	Kaiser, R.	Ammoniaklab., Bad. Anilin- und Soda-Fabrik A.-G.	Chromatographia, 1, 38 (1970)
257				
258	Carbon Dioxide adsorption on Carbon Molecular Sieves	Shafei, M.	Penn. State Univ.	Carbon, 5, 7 (1967)
259				
260	Carbon Molecular Sieves	Metcalfe, J.E. III	Penn State Univ.	Diss. Abstr. B 1966, 27, 803

Table 1B
Adsorption Technology

	A	B	C	D
261				
262	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
263	SECTION B · GAS SEPARATION APPLICATIONS XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
264	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
265				
266	Adsorption of Light Hydrocarbon Mixtures on Molecular Sieving Carbon	Konno, M., Shibata, K., Saito, S.	Dep. Chem. Eng., Tohoku Univ.	J. Chem. Eng. Jpn., 18, 394 (1985)
267				
268	Carbon Adsorbents from Peat for Air Fractionation	Drozhalina, N.D., Paukhov, S.S., Bulgakova, N.A., Kiselev, I.N.	Inst. Torfa, Minsk, USSR	Khim. Tverd. Topl., 4, 124 (1985)
269				
270	Separating a Feed Stream Gas Mixture Using Pressure Swing Adsorption	Vo, T.P.	Calgon Carbon Corp.	Ep 147277, July 1985
271				
272	Mercury Adsorbent Carbons and Carbon Molecular Sieves	Matviya, T.M., Gebhard, R.S., Greenbank, M.	Calgon Carbon Corp.	EP 145539, June 1985
273				
274	Separation of Butane Isomers by Structural Carbon Molecular Sieves	Wantanabe, C.	Dep. Chem. Eng., Nagoya Univ.	Kagaku Kogaku Ronbunshu, 11, 481 (1985)
275				
276	Separation and Purification of Gases with Carbon-Based Molecular Sieves	Richter, E., Knoblauch, K.	Fed. Rep. Ger.	Chem.-Tech. (Heidelburg), 13, 11 (1984)
277				
278	Possibilities for the Adsorptive Separtion of Methane and Carbon Dioxide	Richter, E., Knoblauch, K., Juentgen, H.	Abt. Kohlchem., Bergbau-Forsch. G.m.b.H.	GWF, Gas-Wasserfach: Gas/Erdgas, 12, 10 (1985)
279				
280	Nitrogen Generator for the Production of Low Volume of High Purity Nitrog	Ward, D.E.	Bergwerksverband G.m.b.H.	EP 132756, Feb. 1985
281				
282	Preparation of Nitrogen	Knoblauch, K., Heimbach, H., Burkhard, Dr.	Bergwerksverband G.m.b.H.	Ger. Offen. DE 3307974, Sept 1984
283				
284	Dehydrating Ethanol	Greenbank, M., Rosene, M.R.	Calgon Carbon Corp.	US 4465875 A, Aug 1984
285				
286	High-Purity Argon	NA	Seitetsu Kagaku Co., Ltd.	Jpn. Kokai Tokkyo JP 59/92907, May 1984
287				
288	Bright Heat Treatment with Nitrogen Rich Atmosphere Prepared with	Chen, Z.	Shanghai Ind. Coll.	Jinshu Rechuli, 1, 49 (1984)
289	Carbon Molecular Sieve			
290				
291	Adsorption of Binary Gaseous Mixtures of Ethylene-Ethane and	Nakahara, T., Hirata, M., Amagase, G., Ogura, T.	Tokyo Met. Univ.	J Chem Eng. Data, 29, 202 (1984)
292	Ethylene-Propylene on a Carbon Molecular Sieve			
293				
294	Apparatus with Carbon Molecular Sieves for Nitrogen Enrichment	Chen, Z., Chen, Q.	Shanghai Ind. Univ.	Huaxue Shijie, 24, 302 (1983)
295				
296	Apparatus for the Manufacture of Nitrogen by Air Separation Using	NA	Kimoto Elec. Co. Ltd.	Jpn. Kokai Tokkyo Koho Jp 58/186418, Oct 1983
297	Carbon Molecular Sieve			
298				
299	Pressure Swing Adsorption System	Hill, J.D.	Calgon Carbon Corp.	Eur. Pat. Appl. EP 82153, Oct 1983
300				
301	Heat and Entropy of Gas Adsorption on Peat Carbon Adsorbents	Drozhalina, N.D., Bulgakova, N.A.	Inst. Torfa	Vesti Akad. Navuk BSSR, Ser. Khim. Navuk, 5, 67 (1983)
302				
303	Separation of Nitrogen from Air Using Carbon Molecular Sieves	Chen, Z., Wang, D., Dai, Y.	Shanghai Ind. Univ.	Jinshu Rechuli, 4, 32 (1983)
304				
305	Selective Adsorption of Oxygen	Golovko, G.A., Ignatov, Yu.Ye., Dubinin, M.M., Kadlec, O., Knyazev, S.	Lenegrad Technol. Inst. of the Refrig. Indus.	USSR SU 1026349
306				
307	Inert GasProduction from Air by Using Carbon Molecular Sieves	Knoblauch, K.	Bergbau-Forsch. G.m.b.H.	Industriefeuerung, 26, 46 (1983)
308				
309	Carbon Molecular Sieves Used in Gas Separation	Bird, A.J., Trimm, D.L.	Imp. Coll.	Carbon, 21, 177 (1983)
310				
311	Dynamics of the Adsorption of Oxygen Impurities by 4A	Ignatov, yu. Ye., Golokov, G.A., Kovalev, V.D.	USSR	Issled. I Intensifik. yashin I Apparatov Kholod., Kriogen Tekhn. I Konditsionirovaniya Vozdukha, Zh., 1983 Abs#. No. 11L178
312	Carbon Molecular Sieve			
313				
314	Production of Inert Gas from Air Using Carbon Molecular Sieves	Knoblauch, K.	Bergbau-Forsch. G.m.b.H.	Gas Waerme Int., 32, 78 (1983)
315				
316	Color Photographic Developer Rejuvenation	NA	Konishiroku Photo Ind. Co., Ltd.	Jpn. Kokai Tokkyo Koho JP 58/14831, Jan 1983
317				
318	Cyclic ad- and Desorption on Carbon Molecular Sieves	Pilarczyk, E., Richter, E., Knoblauch, K., Juentgen, H.	Bergbau-Forsch. G.m.b.H.	Chem.-Ing.-Tech., 55, 326 (1983)
319				
320	Reprssurization for a Pressure Swing Adsorption System	Vo, T.P.	Calgon Corp.	Eur. Pat. Appl. EP 55961, July 1982
321				
322	Repressurization for a Pressure Swing Adsorption System	Vo, T.P.	Calgon Corp.	Eur. Pat. Appl. EP 55962, July 1982
323				
324	Repressurization for a Pressure Swing Adsorption System	Vo, T.P.	Calgon Corp.	Eur. Pat. appl. EP 55669, July 1982
325				

	A	B	C	D
326	Separation of Mixtures of Permanent Gases and Light Hydrocarbons	Kusz, P., Andrysiak, A., Bobinski, J.	Blachownia Inst. Heavy Org. Synth.	chromatographia, 15, 297 (1982)
327	on Spherical Carbon Molecular Sieves by Gas-Solid Chromatography			
328				
329	Adsorption of a Gaseous Mixture of Ethylene and Propylene ona Carbon	Nakahara, T., Hirata, M., Mori, H.	Tokyo Metrop. Univ.	J. Chem. Eng. Data, 27, 317 (1982)
330	Molecular Sieve			
331				
332	Adsorptive Elimination of Hydrogen Sulfide fromm Gaseous Mixtures	Henning, K.D., Klein, J., Harder, B.	Bergwerksverband G.m.b.H.	Eur. Pat. Appl. EP 45422, Feb. 1982
333				
334	Process Concept on the Separation of Radioactive Krypton from the	Ringel, H.	Inst. Chem. Techno., Kernforschungsanlage Juelich	Ber. Kernforschungsanlage Juelich, JUEL-1733 1981
335	Dissolver off-gas by Adsorption			
336				
337	Laboratory Tests of air Fractionation into Oxygen and Nitrogen Using	Spitzer, Z., Ulay, J., Hrncir, J.	Czech.	Sb. Pr. UVP, 41, 85 1981
338	a Carbon Molecular Sieve			
339				
340	Removal of Oxygen from Air by Pressure Swing Adsorption Using	Kitagawa, H., Yuki, N.	Natl. Res. Inst. Pollut. Resour.	Nenryo Kyokaishi, 60, 859 (1981)
341	Molecular Sieving Carbon from Coal			
342				
343	Effect of Pressure and temperature on Separation of Air by Adsorption on	Spitzer, Z., Hrncir, J., Ulay, J.	Ustav Vyzk. Vyuziti Paliv	Chem. Prum., 31, 342 (1981)
344	a Carbon Molecular Sieve			
345				
346	Adsorption Production of and Inert Nitrogen Atmosphere	Spitzer, Z., Hrncir, J., Ulay, J.	Ustav Vyzk. Vyuziti Paliv	Chem. Prum., 31, 288 (1981)
347				
348	Adsorption Separation of Gaseous Binary Mixtures on Molecular Sieves	Veyssiere, M.C., Clavaud, C., Cartraud, P., Cointot, A.	Lab. Chim.-Phys.	J.Chem. Soc., Faraday Trans. 1, 77, 1417 (1981)
349				
350	Adsorptive Separation of Gas Mixtures Containing at Least Oxygen	Knoblauch, K., Heimbach, H.	Bergwerksverband G.m.b.H.	Ger. offen. DE 2932333, Feb. 1981
351	Along with Nitrogen			
352				
353	Adsorption of a Gaseous Mixture of Ethane and Propane on a Carbon	Nakahara, T., Hirata, M., Komatsu, S.	Tokyo Metrop. Univ.	J.Chem Eng. Data, 26, 161 (1981)
354	Molecular Sieve			
355				
356	Carbon Molecular Sieves-Survey of Present Knowledge and Theory of an	Spitzer, Z., Hrncir, J.	Ustav Vyzk. Vyuziti Paliv	Sb. Pr. UVP, 39, 42 (1980)
357	Adsorption Process for Separating Gas Mixtures			
358				
359	Removal Of Oxygen from Air by Pressure Swing Adsorption with a	Kitagawa, H., Yuki, N.	Natl. Res. Inst. Pollut. Res.	Nippon Kagaku Kaishi, 12, 1894 (1980)
360	Carbonaceous Adsorbent made From Saran Waste			
361				
362	Separation of Air on a Molecular Sieve	Spitzer, Z., Hrncir, J., Ulay, J.	Ustav Vyzk. Vyuziti Paliv	Chem. Prum., 30, 173 (1980)
363				
364	New Method for Obtaining Hydrogen with Carbon Molecular Sieves	Juentgen, H., Knoblauch, K., Reichenberger, J., Schroeter, H.J.	Bergbau-Forsch. G.m.b.H.	NTIS: Energy Res Abstr. 1978, 4, Abstr. No. 32726 (1977)
365				
366	New Process for Hydrogen Recovery Using Carbon Molecular Sieves	Knoblauch, K., Reichenberger, J., Schroeter, H.J., Juentgen, H.	Bergbau-Forsch. G.m.b.H.	Comm Eur. Comm., EUR, Vol. Date 1977, EUR 6075, Round Table Meet
367				
368	A New Method for the Production of Hydrogen with Carbon Molecular Siev	Knoblauch, K., Reichenberger, J., Schroeter, H.J., Juentgen, H.	Bergbau-Forsch. G.m.b.H.	VDI-Ber., Vol. Date 1977, 315, 187 (1978)
369				
370	A New Method for the Production of Hydrogen with Carbon Molecular Siev	Knoblauch, K., Reichenberger, J., Schroeter, H.J., Juentgen, H.	Bergbau-Forsch. G.m.b.H.	Chem.-Ing.-Tech., 50, 212 (1978)
371				
372	Adsorption rate on Molecular Sieving Carbon by Chromatography	Chihara, k., Suzuki, M., Kawazoe, K.	Inst Ind. Sci., Univ. Tokyo	Pac. Chem. Eng. Congr., 2, 88 (1977)
373				
374	High Purity Hydrogen from Hydrogen-Containing Gases	Juentgen, H., Knoblauch, K., Reichenberger, J., Schroeter, H.J.,	Bergbau-Forsch. G.m.b.H.	Ger. Offen. DE 2650381, May 1978
375		Juergen, H.		
376				
377	Carbon Molecular Sieves as Technical Adsorbents	Juentgen, H., Knoblauch, K., Reichenberger, J., Schroeter, H.J.	Bergbau-Forsch. G.m.b.H.	Carbon '76, Int. Carbon Conf. Prepr., 2nd, 72 (1976)
378				
379	Separation of Oxygen and Nitrogen Using 5A Zeolite and Carbon Molecular	Nandi, S.P., Walker, P.L. Jr.	Penn State Univ.	Sep. Sci., 11, 441 (1976)
380	Sieve			
381				
382	Recovery of Nitrogen-Rich Gases fron Air	Herbst, h., Juentgen, H., knoblauch, K., Koerbaecker, W.,	Bergwerksverband G.m.b.H.	Ger. Offen. DE 2441447, Mar. 1976
383		Muenzner, H., Peters, W.		
384				
385	Analysis of Air Pollutants Using Sampling Tubes and Gas Chromatography	Russel, J.W.	Dow Chem Co.	Environ. Sci. Technol., 9, 1175 (1975)
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387	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
388	SECTION C: CATALYTIC APPLICATIONS XXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
389	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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Table 1C
Catalytic Applications

	A	B	C	D
391	Diels-Alder Cyclodimerization Over a Carbon molecular Sieve Catalyst	Dessau, R.M.	Mobil Oil Corp.	US 4413154
392				
393	Effect of The Pore Structure on the Catalytic Properties of Platinum-	Bragin, O.V., Tatjana, G., Ludwig, J., Fiebig, W., Hesse, K., Schrubel,	Zelinskij Inst. Org. Chem.	Z. Chem., 20, 387 (1980)
394	Carbon Molecular Sieves			
395				
396	Carbon as a Support for Catalysts. IV. Modification of Molecular Sieve	Walker, P.L. Jr., Oya, a., Mahajan, O.P.	Penn State Univ.	Carbon, 18, 377 (1980)
397	Character of Glassy Carbon by Varying the Heat Treatment			
398				
399	Some Trends in the Use of Carbon Molecular Sieves	Tengler, S., Gierulusko, D.	Inst. Chem. Wyzsz. Szk. Pedgadog.	Chemik, 30, 370 (1977)
400				
401	The Catalytic Activity of Metal-containing Molecular Sieve Composites As	Cooper, B.J., Trimm, D.L., Wilkinson, A.	Johnson Matthey and Co. Ltd.	Lond. Int. Conf. Carbon Graphite, 4th Mtg. Date 1974, 396,
402	a Function of the Location of the Metal			Soc. Chem. Ind.: Lond., Engl.
403				
404	Carbon Molecular Sieve Catalysts	Cooper, B.J.	Johnson Matthey and Co. Ltd.	US 37932224, Feb 1974
405				
406	Propylene Hydrogenation Over Platinum/Carbon Molecular Sieve Catalysts	Trimm, D.L., Cooper, B.J.	Imp. Coll.	J. Catal., 31, 287 (1973)
407				
408	Carbon Molecular Sieve Supports for Metal Catalysts. I. Preparation of the	Schmitt, J.L., Jr., Walker, P.L., Jr.	Penn State Univ.	Carbon, 9, 791 (1971)
409	System Platinum Supported on Polyfurfuryl Alcohol Carbon			
410				
411	Carbon Molecular Sieve Supports for Metal Catalysts. II. Selective	Schmitt, J.L. Jr., Walker, P.L. Jr.	Penn State Univ.	Carbon, 10, 87 (1972)
412	Hydrogenation of Hydrocarbons Over Platinum Supported on Polyfurfuryl			
413	Alcohol Carbon			
414				
415	Carbon Molecular Sieves as Selective Catalyst Supports	Schmitt, J.L. Jr.	Penn State Univ.	Diss. Abstr. Int. B 1971, 32, 807
416				
417	Selectivity of Carbon Molecular-Sieve Supported Catalysts	Cooper, B.J., Trimm, D.L.	Imp. Coll.	Conf. Ind. Carbon Graphite, 3rd Mtg. Date 1970, 189,
418				Soc. Chem. Ind.: London, England
419				
420	Platinum-Carbon Catalysts with Molecular Sieve Properties	Cooper, B.J.	JohnsonMatthey and Co., Ltd.	Platinum Metals Rev., 14, 133 (1970)
421	Shape Selectivity in Hydrogenation Catalysis			
422				
423	Preparation of Selective Carbon Molecular Sieve Catalysts	Trimm, D.L., Cooper, B.J.	Imp. Coll.	J. Chem. Soc. D, 8, 477 (1970)
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Table 2

Comparative Dimensions of Zeolitic Pores and Small Molecules

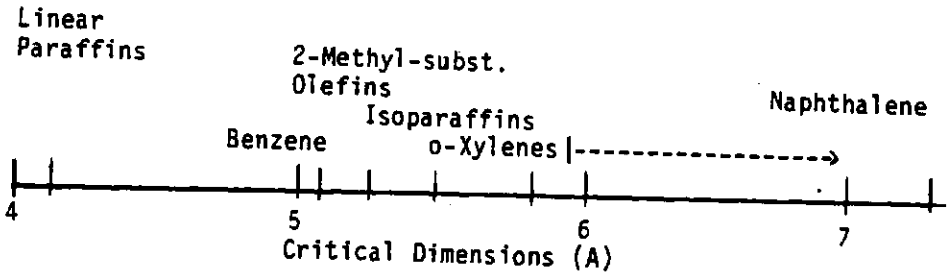

Table 3

Critical Pore Dimensions of Various Zeolites

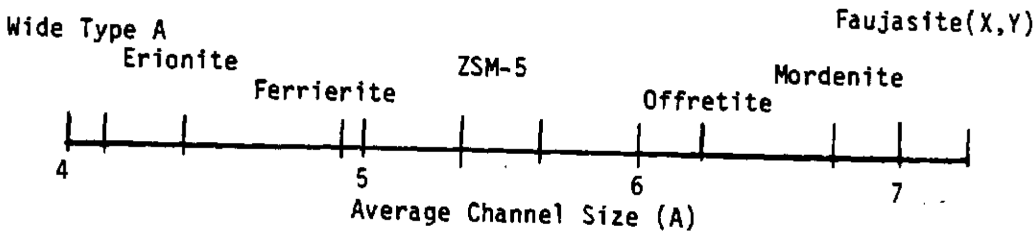

Table 4

Critical Dimensions of Probe Molecules

Absorbate	(Å)
Carbon Dioxide	3.3
n-Butane	4.3
iso-Butane	5.0
neo-Pentane	6.2

TABLE 5.

Molecular Probe Data for All IOM-CMS Materials

SAMPLE	TYPE	FORM	I.D.	SPECIFIC ADSORPTION (mg gas/g sample) CO_2	n-butane	iso butane	neo pentane
SiO_2	1	spheres	A	46	151	134	158
		spheres	B	32	35	32	38
		spheres	C	16	13	11	9
		spheres	D	14	4	8	5
		spheres	E	31	9	9	4
SiO_2	1	8 X 12	A	16	40	40	50
		8 X 12	B	37	25	16	15
		8 X 12	C	42	12	10	6
		8 X 12	D	33	5	4	2
		8 X 12	E	31	0	0	1
Al_2O_3	1	extrudates	A	33	69	66	80
		extrudates	B	30	47	44	52
		extrudates	C	30	38	37	38
		extrudates	D	27	37	34	37
SiO_2/Al_2O_3	1	pellets	A	20	49	47	60
		pellets	B	29	40	37	34
		pellets	C	30	23	17	9
		pellets	D	22	10	11	3
		pellets	E	28	10	3	0
		pellets	F	30	10	8	5
$FeKSiO_2$	1	8x18 mesh	A	48	0	0	1
TiO_2	1	pellets	A	8	11	13	15
		pellets	B	8	2	0	1
		pellets	C	19	2	0	1
Ru/SiO_2	1	8x18 mesh	A	27	102	96	128
		8x18 mesh	B	17	1	0	1
TiO_2/ZrO_2	1	pellets	A	29	54	54	68
		pellets	B	27	21	16	7
		pellets	C	11	6	5	1
CARBON PFA	1		A	3	1	0	1
		liquid	B	0	1	0	0

TABLE 5 (cont.)

FT CAT.	1	8x18 mesh	A	7	8	9	9
FT CAT.		8x18 mesh	B	35	1	0	0
CARBON	1	8x18 mesh	A	56	0	0	0
		8x18 mesh	B	52	0	0	0
		8x18 mesh	C	47	0	0	0
		8x18 mesh	D	54	0	0	0
		8x18 mesh	E	55	0	0	0
SiO2	1	40x80 mesh	A	16	42	45	57
		40x80 mesh	B	19	45	25	61
		40x80 mesh	C	25	69	53	67
		40x80 mesh	D	33	74	54	47
		40x80 mesh	E	29	61	4	10
		40x80 mesh	F	33	39	2	6
TiO2/ZrO2	1	extrudates	A	30	26	21	21
		extrudates	B	24	31	25	25
		extrudates	C	17	38	26	31
		extrudates	D	20	11	1	1
Ti/C	2A	liquid	A	45	0	0	0
Ti/C		liquid	B	65	0	0	0
Ti/C		liquid	C	58	0	0	0
Ti/C		liquid	D	51	0	0	0
Ti/C		liquid	E	65	0	0	0
Ti/C		liquid	F	34	0	0	0
Ti/C		liquid	G	39	0	0	0
Ti/C		liquid	H	31	0	0	0
Ti/C		liquid	I	30	0	0	0
Zr/C	2A	liquid	A	59	0	0	0
Zr/C		liquid	B	48	0	0	0
Zr/C		liquid	C	31	0	0	0
Zr/C		liquid	D	70	0	0	0
Al/C	2A	liquid	A	62	0	0	0
Al/C		liquid	B	63	0	0	0
Al/C		liquid	C	55	0	0	0
Al/C		liquid	D	66	0	0	0
Al/C		liquid	E	64	0	0	0
Al/C		liquid	F	58	0	0	0
Al/C		liquid	G	44	0	0	0
Al/C		liquid	H	54	4	0	1
(Ti-Zr)O2/C	2A	liquid	A	59	0	0	0
		liquid	B	57	0	0	0
		liquid	C	50	0	0	0
		liquid	D	41	0	0	0

TABLE 5 (cont.)

SiO2	2B	powder	A	25	2	2	2
		powder	B	24	2	2	2
		powder	C	--	--	--	--
		powder	D	28	19	13	22
		powder	E	10	27	20	25
		powder	F	14	28	30	30
		powder	G	11	26	25	28
TiO2/C	2B	powder	A	27	15	0	2
TiO2/C		powder	B	22	16	0	1
TiO2/C		powder	C	32	13	0	0
TiO2/C		powder	D	29	6	0	0
ZrO2/C	2B	powder	A	28	26	4	1
ZrO2/C		powder	B	35	15	0	0
ZrO2/C		powder	C	41	0	0	0
(Ti-Zr)O2/C	2B	powder	A	38	8	0	0
(Ti-Zr)O2/C		powder	B	45	0	0	
TiO2/WPC	3	powder	A	50	30	0	6
TiO2/WPC		powder	B	62	4	0	3
TiO2/WPC		powder	C	64	1	0	2
ZrO2/C	3	powder	A	57	39	0	6
ZrO2/C		powder	B	59	27	0	5
ZrO2/C		powder	C	55	1	0	2
TiO2/C	3	powder	A	54	44	0	6
TiO2/C		powder	B	47	6	0	3
TiO2/C		powder	C	57	1	0	2

Table 6

Carbon Burnoff Data for C-TiO_2

PERCENT COMPOSITION OF TITANIA PELLETS
Coating vs. Carbon Burn-off

Coating Step	Initial Weight	Final Weight	(Coating) TiO_2	(Coating) % Carbon	(Burn-off) TiO_2	(Burn-off) % Carbon	Δwt
1	50.0	58.5	85.5	14.5	85.7	14.3	8.5
2	55.5	61.2	76.2	23.8	76.1	23.9	5.7
3	58.2	59.8	73.5	26.5	73.8	26.2	1.5
4	56.7	56.9	73.2	26.8	73.5	26.5	0.2
5	52.2	52.0	73.5	26.5	73.7	26.3	0.0
6	49.0	49.0	73.5	26.5	71.3	28.7	0.0
7	45.9	46.5	72.2	27.8	70.0	30.0	0.6
8	43.5	44.3	70.4	29.6	69.2	30.8	0.8
9	40.3	40.7	69.4	30.6	64.4	35.6	0.4
10	37.7	37.9	68.9	31.1	66.2	33.8	0.2
11	34.8	35.2	67.8	32.2	64.5	35.5	0.4
12	32.1	32.3	67.2	32.8	69.2	30.8	0.2

Table 7

Carbon Burnoff Data for C-SiO_2

PERCENT COMPOSITION OF LARGE PORE SILICA

Coating vs. Carbon Burn-off

Coating	Initial	Final	(Coating)		(Burn-off)		
Step	Weight	Weight	SiO_2	% Carbon	SiO_2	% Carbon	Δwt
1	50.0	53.1	94.1	5.9	89.5	10.5	3.1
2	50.1	53.2	88.3	11.7	83.5	16.5	3.1
3	50.2	53.4	82.3	17.7	74.8	25.2	3.2
4	50.2	52.5	78.0	22.0	70.6	29.4	2.3
5	49.5	56.1	66.3	33.7	67.5	32.5	6.6
6	53.1	57.2	59.1	40.9	58.4	41.6	4.2
7	54.2	57.3	53.7	46.3	55.5	44.5	3.1
8	54.3	55.9	50.8	49.2	56.4	43.6	1.6
9	52.9	55.3	46.5	53.5	52.5	47.5	2.4
10	52.2	53.8	43.5	56.5	53.2	46.8	1.7
11	50.8	51.2	42.7	57.3	51.5	48.5	0.4
12	48.2	49.3	40.5	59.5	48.6	51.4	1.1

Table 8

Carbon Burnoff Results-Compositional Data for Type IIa Materials

SAMPLE	% COMPOSITION (MO/C)* PREDICTED	(MO/C) ACTUAL	% CONVERSION METAL OXIDE	CARBON
TiO2/C				
108A	17/83	9/91	83	32
108B	28/72	14/86	82	43
108C	40/60	20/80	87	51
108D	0/100	0/100	-	25
119E	62/38	42/58	62	27
146E	62/38	36/64	84	49
119F	80/20	63/37	75	35
122G	86/14	56/44	73	38
122H	89/11	60/40	79	35
ZrO_2/C				
110A	24/76	12/88	71	32
110B	38/62	20/80	69	33
110C	48/52	30/70	79	36
110D	0/100	0/100	-	23
Al2O3/C				
112A	26/74	13/87	41	24
112B	38/62	18/87	55	32
112C	56/44	40/60	74	26
112D	0/100	0/100	-	28
(Ti-Zr)O2/C				
117A	20/80	10/90	79	36
117B	31/69	17/83	89	42
117C	60/40	26/74	95	49
117D	0/100	0/100	-	27

*(METAL OXIDE/CARBON)

Sample 146E was prepared and analyzed to be used in place of 119E, which lost much of its metal oxide during carbonization.

Table 9

Carbon Burnoff Results-Compositional Data for Type IIb Materials

SAMPLE	% COMPOSITION (MO/C)* PREDICTED	% COMPOSITION (MO/C) ACTUAL	% CONVERSION METAL OXIDE	% CONVERSION CARBON
TiO2/C				
123	71/29	61/39	92	26
115A	71/29	57/43	77	29
115B	56/44	47/53	89	28
115C	38/62	46/54	71	15
ZrO2/C				
118A	71/29	60/40	92	31
118B	56/44	44/56	96	31
118C	38/62	32/68	42	11
(Ti-Zr)O2/C				
125B	56/44	44/56	84	26
125C	38/62	32/68	73	19

* (METAL OXIDE/CARBON)

Table 10

Catalyst Testing Results for Carbon-C-73

Catalyst	Run #	Temp. (°C)	Press. (Psig)	Flow Rate (Sccm)	CO/H_2	Collection Time (hr)	CO Conv. (%)	H Conv. (%)	Hydrocarbon yield (gm)	Aqueous phase yield (gm)
Carbon Coated C-73 (S-15292-27B)	7	325	500	50	1	76	41	13	11.0	trace
"	8	50	500	50	1	76	83	39	16.0	trace
"	9	350	500	50	0.5	69	84	39	6.0	trace
C-73	10	350	500	50	1	46	72	42	19.0	<2.3
"	11	50	500	50	0.5	21	73	(122)	--	--
Carbon Coated C-73 (S-15250-105)	12	350	500	50	1	51	74	--	27.2	1.0
"	13	350	500	50	1	72	84	72	42.6	1.5
"	14	350	750	50	1	48	75	28	13.2	5.0
"	15	350	500	20	1	67	36	26	5.2	0.6

Table 11

Catalyst Testing Results for $C-Fe/SiO_2$

Catalyst	Run #	Temp. (°C)	Press. (Psig)	Flow Rate (sccm)	CO/H_2	Collection Time (hrs)	CO Conv. (%)	H_2 Conv. (%)	Hydrocarbon yield (gms)	Aqueous phase yield (gms)
Fe/SiO_2	17a	350	500	50	1	45	37	43	2.2	trace
	b	350	500	20	1	49	68	60	0.8	1.6
	c	350	250	20	1	101.2	20	32	-	-
	d	350	250	50	4	19	34	9	-	-
	e	325	250	50	4	24	21	8	-	-
	f	300	250	50	4	24	14	8	-	-
	g	275	250	50	4	24	9	8	-	-
	h	250	250	50	4	25	6	7	-	-
	i	250	250	20	2	24	14	(101)	-	9.7
Carbon-Coated Fe/SiO_2	16a	350	500	50	1	41	8	17	0.3	1.6
	16b	350	500	20	1	48	56	68	0.2	0.1
	16c	350	250	20	1	101	86	86	1.7	trace
	16d	32	250	50	4	24	57	4	-	-
	16e	300	250	50	4	24	-	-	-	7.4
	16f	275	250	50	4	21	-	-	-	-
	16g	250	250	50	4	21	-	-	-	-
	16h	250	250	20	2	119	34	39	-	9.4

Table 12

Catalyst Testing Results for C-Fe-K/SiO2

Comparative Data for Fe-K/SiO_2 Versus C-Fe-K/SiO_2

Catalysts Sample No. Run No.	Fe-K/SiO_2 S-15319-106 18-2-1	C-Fe-K/SiO_2 S-15319-126 E 19-2/1
T(°C)	325	325
P (psig)	500	500
Feed Rate (SCCM)	25	25
% CO in Feed	54	51
% H_2 in Feed	46	49
Moles CO Fed	3.5	2.3
Moles H_2 Fed	3.0	2.2
% CO Converted	15.3	16.6
% H_2 Converted	5.4	6.4
Moles CO Converted	0.5	0.4
Moles H_2 Converted	0.2	0.1
Hot Trap Hydrocarbon (g)	2.1	0.6
Cold Trap Hydrocarbon (g)	0.0	0.0
Total Hydrocarbon (g)	4.4	3.0
Gram Fractions, Cn		
1	0.18	0.26
2	0.08	0.13
3	0.10	0.17
4	0.08	0.12
5	0.06	0.08
6	0.04	0.05
7	0.02	0.02
8	6E-3	6E-3
9	6E-3	5E-3
10	5E-3	8E-3
12	1E-2	8E-3
14	7E-3	5E-3
16	5E-3	4E-3
18	4E-3	2E-3
20	4E-3	3E-3
22	3E-3	2E-3
24	2E-3	2E-3
26	2E-3	2E-3

Table 13

Catalyst Testing Results for Rh-Mo/Al_2O_3

Data for Rh-Mo/ Al_2O_3 at High Pressure

Catalyst	3% Rh - 3% Mo/Al_2O_3			
Sample No.	S-15292-42			
Run No.	22-1	22-2	22-3	22-4
T (°C)	250	250	250	250
P (psig)	250	500	750	970
GHSV (hr^{-1})	140	140	140	140
% CO in Feed	50	57	57	57
% H_2 in Feed	50	43	43	43
% CO Converted	13.5	6.8	9.0	13.1
% H_2 Converted	13.6	5.6	6.8	13.7
Mole %, Cn				
C_1	30.1	25.0	24.0	18.5
C_2	6.8	6.4	6.0	4.0
C_3	4.9	3.5	3.0	2.0
C_4	1.9	1.1	1.2	1.0
$>C_5$	4.9	1.7	1.2	1.0
Dimethylether	35.9	51.2	51.0	58.5
Methylethylether	15.5	11.3	14.0	8.0
Methanol	--	--	--	7.0
Ethanol	--	--	--	--

Table 14

XPS Results for Rh-Mo/Al_2O_3

XPS: Rh-Mo/Al_2O_3

In-Situ Treatments Conditions	Binding Energy (ev)		Atom Ratios		
	Rh	Mo	Rh/Mo	Rh/Al	Mo/Al
Fresh	309.0	232.5	1.2	0.03	0.03
1 Hr; H_2; 450C	307.7	"	"	"	"
+1 Hr; H_2; 450C	307.4	232.6	1.3	"	"
1 Hr; CO; 25C	307.4	232.4	1.2	"	"

Table 15

Catalyst Test Results for FT-Based Materials

	A	B	C	D	E	F	G	H
2	TABLE 1							
3		C-FT TY-I			FT NATIVE		C-FT TY-II	
4								
5	RUN NO.	23-1-1	23-2-1	23-3-1	25-1-1	26-1-1	26-2-1	26-3-1
6								
7	TEMP. (C)	250	250	250	250	250	250	250
8	PRESS. (psig)	500	800	250	250	500	800	250
9	FD. RATE(sccm)	19	19	19	19	18	18	18
10	%CO IN FEED	49	49	51	51	51	51	51
11	%CO IN FEED	51	51	49	49	49	49	49
12	MOLES CO FED	3.2	2.5	1.9	3.4	3.3	2.36	2.34
13	MOLES H2 FED	3.4	2.4	1.8	3.2	3.2	2.27	2.24
14	% CO CONVERTED	35.4	34.3	22.7	36	93.1	66.6	24.1
15	% H2 CONVERTED	8.7	9.7	3.5	15.1	34.5	23.8	6.9
16	MOLES CO CONVERTED	1.2	0.85	0.43	1.2	3.1	1.57	0.56
17	MOLES H2 CONVERTED	0.3	0.23	0.06	0.5	1.1	0.54	0.15
18	TRAPPED HYDROCARBON	5	2.4	3.48	2.9	6.3	5.1	5.5
19	TOTAL HYDROCARBON	12.7	6.49	5.06	5.7	18.2	10.4	9
20	POLYM. PROB. C2-C6 ( )	0.54	0.35	0.61	0.56	0.48	0.26	0.51
21	DEG. OF POLYM. C2-C6 ( )	2.2	1.55	2.55	2.2	1.9	1.4	2.03
22	CARBON BALANCE	91	71.8	84.4	30	98.9	67.2	96.5
23	GMS HC per M3 SYNGAS CONVTD.	182.3	104.5	168.8	45	171.4	119.1	221.4
24	GMS C1toC4perM3 SYNGAS CONVTD.	83.2	54.1	36.1	14	92.5	49.2	63.9
25	GMS C5toC11perM3 SYNGAS CONVTD.	61.2	31.5	72.5	17.8	47.2	43	73.1
26	GMS C12toC19perM3 SYNGAS CONVTD.	26	13.5	42.7	8.8	16.4	15.5	58.9
27	GMS Cabove19perM3 SYNGAS CONVTD.	12	5.4	17.5	4.4	15.3	11.3	25.5
28	GMS C02/M3 SYNGAS CONVTD.	402.9	314.8	330.1	10.1	486.6	308.9	452.2
29	GRAM FRACTION :C1 TO C4	0.45639	0.52	0.21	0.31111	0.53967	0.41	0.29
30	GRAM FRACTION :C5 TO C11	0.33571	0.3	0.43	0.39556	0.27538	0.36	0.33
31	GRAM FRACTION :C12 TO C19	0.14262	0.13	0.25	0.19556	0.09568	0.13	0.27
32	GRAM FRACTION :ABOVE C19	0.06583	0.05	0.1	0.09778	0.08926	0.1	0.12

	I	J	K	L
2				
3		C-FT (NON-SIEVING)		
4				
5	29-1-1	29-2-1	29-3-1	29-4-1
6				
7	250	280	310	340
8	500	500	500	500
9	20	20	20	20
10	48.4	48.4	48.4	48.4
11	51.5	51.5	51.5	51.5
12	1.9	1.9	1.9	1.9
13	2	2	2	2
14	58.7	86.5	92.2	91.9
15	11.9	12.4	27.2	34.6
16	1.1	1.6	1.7	1.7
17	0.2	0.2	0.5	0.7
18	3.1	4.5	7	6.6
19	8.1	9.3	13.8	14.5
20	0.53	0.49	0.5	0.49
21	2.15	1.97	2	1.97
22	85.9	79.1	82.8	85.9
23	143.4	137	178.3	174.4
24	71.6	56.2	66.4	70.9
25	47.2	43.8	61	60.6
26	15.9	20.3	24.3	18.4
27	8.7	16.8	26.5	24.5
28	486.6	395	355.2	379.4
29	0.4993	0.41022	0.37241	0.40654
30	0.32915	0.31971	0.34212	0.34748
31	0.11088	0.14818	0.13629	0.1055
32	0.06067	0.12263	0.14863	0.14048

Table 16

Catalyst Test Results for Type I,C-FT-HC(1:1)

	M	N	O	P	Q	R	S
2	TABLE 2.A						
3	C-FT-HC(1:1) TY-I						
4							
5	RUN NO.	27-14-1	27-16-1	27-17-1	27-18-1	27-19-1	27-20-1
6							
7	TEMP. (C)	250	280	295	310	325	340
8	PRESS. (psig)	500	500	500	500	500	500
9	FD. RATE(sccm)	18	18	18	18	18	18
10	%CO IN FEED	50	50	50	50	50	50
11	%H2 IN FEED	50	50	50	50	50	50
12	MOLES CO FED	1.69	1.69	1.73	1.75	1.92	2.15
13	MOLES H2 FED	1.69	1.69	1.73	1.75	1.92	2.15
14	% CO CONVERTED	3.8	5.7	17.1	28.4	37.9	48.5
15	% H2 CONVERTED	6.6	18.3	22.7	33	39.4	41.7
16	MOLES CO CONVERTED	0.06	0.1	0.29	0.5	0.73	1.04
17	MOLES H2 CONVERTED	0.11	0.31	0.39	0.58	0.76	0.89
18	TRAPPED HYDROCARBON	0.45	0.34	0.86	0.76	0.76	1.07
19	TOTAL HYDROCARBON	2.26	4.68	6.85	6.81	9.57	11.1
20	POLYM. PROB. C2-C6 ( )	0.56	0.54	0.53	0.51	0.5	0.34
21	DEG. OF POLYM. C2-C6 ( )	2.29	2.16	2.13	2.05	2	1.52
22	CARBON BALANCE	86.5	93.8	100	82.5	100.4	96.3
23	GMS HC_per_M3_SYNGAS_CONVTD.	123	158.8	198.3	125.5	159.4	153.4
24	GMS_C1toC4perM3_SYNGAS_CONVTD.	82.4	131.7	153.4	101.6	137.5	128.7
25	GMS_C5toC11perM3_SYNGAS_CONVTD.	36.2	23.9	33.3	16.4	16.1	16.2
26	GMS_C12toC19perM3_SYNGAS_CONVTD.	1.4	1.8	4.3	3.3	3.1	2.9
27	GMS_Cabove19perM3_SYNGAS_CONVTD.	3	1.4	7.3	4.2	2.7	5.5
28	GMS C02/M3 SYNGAS CONVTD.	83.7	230.7	344	344	461.5	459.6
29	GRAM_FRACTION_:C1_TO_C4	0.66992	0.82935	0.77358	0.80956	0.86261	0.83898
30	GRAM_FRACTION_:C5_TO_C11	0.29431	0.1505	0.16793	0.13068	0.101	0.10561
31	GRAM_FRACTION_:C12_TO_C19	0.01138	0.01134	0.02168	0.02629	0.01945	0.0189
32	GRAM_FRACTION_:ABOVE_C19	0.02439	0.00882	0.03681	0.03347	0.01694	0.03585

Table 17

Catalyst Test Results for C-FT-HC(1:1),Non-Sieving

	T	U	V	W	X	Y
2	TABLE 2.B					
3	C-FT-HC(1:1) NON-SIEVING					
4						
5	RUN NO.	28-1-1	28-2-1	28-3-1	28-4-1	28-5-1
6						
7	TEMP. (C)	250	280	310	340	295
8	PRESSURE(PSIG)	500	500	500	500	500
9	FD. RATE(sccm)	20	20	20	20	20
10	%CO IN FEED	48.2	48.2	48.2	48.2	48.2
11	%H2 IN FEED	51.8	51.8	51.8	51.8	51.8
12	MOLES CO FED	1	1.65	2.02	2.97	1.4
13	MOLES H2 FED	1.07	1.77	2.17	3.19	1.47
14	% CO CONVERTED	9.52	16.1	36.9	62.2	58.7
15	% H2 CONVERTED	19.9	34.7	51.1	59.6	28.1
16	MOLES CO CONVERTED	0.1	0.27	0.74	1.87	0.82
17	MOLES H2 CONVERTED	0.21	0.62	1.11	1.9	0.41
18	TRAPPED HYDROCARBON	0.57	1.57	0.88	2.26	0.65
19	TOTAL HYDROCARBON	2.63	7.01	8.76	17.9	5.63
20	POLYM. PROB. C2-C6 ( )	0.53	0.49	0.48	0.52	0.35
21	DEG. OF POLYM. C2-C6 ( )	2.1	1.96	1.94	2.08	1.55
22	CARBON BALANCE	76.8	97.3	93.8	90.7	73.4
23	GMS_HC_per_M3_SYNGAS_CONVTD.	103.6	144.7	126.4	142.4	130.6
24	GMS_C1toC4perM3_SYNGAS_CONVTD.	66	103.1	107.3	115.8	104.5
25	GMS_C5toC11perM3_SYNGAS_CONVTD.	26.6	29.2	11.1	19.4	21.8
26	GMS_C12toC19perM3_SYNGAS_CONVTD.	3.6	8.9	5.2	3.8	2.9
27	GMS_Cabove19perM3_SYNGAS_CONVTD.	7.4	3.5	2.7	3.5	1.4
28	GMS C02/M3 SYNGAS CONVTD.	157.3	348.5	407.3	379.3	294
29	GRAM_FRACTION_:C1_TO_C4	0.63707	0.71251	0.84889	0.8132	0.80015
30	GRAM_FRACTION_:C5_TO_C11	0.25676	0.2018	0.08782	0.13624	0.16692
31	GRAM_FRACTION_:C12_TO_C19	0.03475	0.06151	0.04114	0.02669	0.02221
32	GRAM_FRACTION_:ABOVE_C19	0.07143	0.02419	0.02136	0.02458	0.01072

Table 18

Catalyst Test Results for FT-HC(1:1),Native

	Z	AA	AB	AC	AD
2	TABLE 2.C				
3	FT-HC(1:1) NATIVE				
4					
5	RUN NO.	30-1-1	30-2-1	30-3-1	30-4-1
6					
7	TEMP. (C)	250	280	310	340
8	PRESS. (psig)	500	500	500	500
9	FD. RATE(sccm)	18.8	18.8	18.8	18.8
10	%CO IN FEED	50.2	50.2	50.2	50.2
11	%H2 IN FEED	49.8	49.8	49.8	49.8
12	MOLES CO FED	1.83	1.83	1.83	1.69
13	MOLES H2 FED	1.81	1.81	1.81	1.67
14	% CO CONVERTED	9.96	34	43.9	77.9
15	% H2 CONVERTED	24.7	36.6	51.9	59.4
16	MOLES CO CONVERTED	0.18	0.62	0.8	1.31
17	MOLES H2 CONVERTED	0.45	0.66	0.94	0.99
18	TRAPPED HYDROCARBON	0.44	2.16	2.21	0.78
19	TOTAL HYDROCARBON	5.18	9.47	11.1	11.7
20	POLYM. PROB. C2-C6 ( )	0.53	0.49	0.49	0.51
21	DEG. OF POLYM. C2-C6 ( )	2.12	1.96	1.97	2.04
22	CARBON BALANCE	80	91.4	95.3	94.9
23	GMS_HC per M3_SYNGAS_CONVTD.	111.4	150.8	159	169.1
24	GMS_C1toC4perM3_SYNGAS_CONVTD.	90.4	107	119.8	149.8
25	GMS_C5toC11perM3_SYNGAS_CONVTD.	17.7	23	21.7	13.3
26	GMS_C12toC19perM3_SYNGAS_CONVTD.	2.2	12.8	9.6	3.2
27	GMS_Cabove19perM3_SYNGAS_CONVTD.	1	7.9	7.9	2.8
28	GMS C02/M3 SYNGAS CONVTD.	185.8	365.9	382.2	418.7
29	GRAM_FRACTION :C1_TO_C4	0.81149	0.70955	0.75346	0.88587
30	GRAM_FRACTION :C5_TO_C11	0.15889	0.15252	0.13648	0.07865
31	GRAM_FRACTION :C12_TO_C19	0.01975	0.08488	0.06038	0.01892
32	GRAM_FRACTION :ABOVE_C19	0.00898	0.05239	0.04969	0.01656

Table 19

Catalyst Test Results for Type I,C-FT-HC(6:1)

	AE	AF	AG	AH	AI
2	TABLE 3.A				
3	C-FT-HC(6:1) TY-I				
4					
5	RUN NO.	32-1-1	32-2-1	32-3-1	32-4-1
6					
7	TEMP. (C)	250	280	310	340
8	PRESS. (psig)	500	500	500	500
9	FEED RATE(SCCM)	20	20	20	20
10	%CO IN FEED	52.8	52.8	52.8	52.8
11	%H2 IN FEED	47.2	47.2	47.2	47.2
12	MOLES CO FED	2.01	2	2.03	2.1
13	MOLES H2 FED	1.8	1.79	1.81	1.88
14	% CO CONVERTED	12.6	37.7	71.2	50.6
15	% H2 CONVERTED	27.2	38.7	47.6	47.9
16	MOLES CO CONVERTED	0.25	0.76	1.44	1.06
17	MOLES H2 CONVERTED	0.49	0.69	0.86	0.9
18	TRAPPED HYDROCARBON	0.93	3.79	3.93	1.43
19	TOTAL HYDROCARBON	6.24	11.4	13.2	9.74
20	POLYM. PROB. C2-C6 ( )	0.5	0.47	0.49	0.44
21	DEG. OF POLYM. C2-C6 ( )	2	1.89	1.98	1.76
22	CARBON BALANCE	83.8	86.9	89	80.9
23	GMS HC per M3 SYNGAS CONVTD.	123.5	155.2	171	126.4
24	GMS C1toC4perM3 SYNGAS CONVTD.	93.7	86.8	108.7	102.4
25	GMS C5toC11perM3 SYNGAS CONVTD.	20	37.5	35.8	12.4
26	GMS C12toC19perM3 SYNGAS CONVTD.	5.1	16.2	14.6	7.2
27	GMS Cabove19perM3 SYNGAS CONVTD.	4.8	14.6	11.8	4.5
28	GMS C02/M3 SYNGAS CONVTD.	268.8	350.1	399.6	376.1
29	GRAM FRACTION :C1 TO C4	0.7587	0.55928	0.63567	0.81013
30	GRAM FRACTION :C5 TO C11	0.16194	0.24162	0.20936	0.0981
31	GRAM FRACTION :C12 TO C19	0.0413	0.10438	0.08538	0.05696
32	GRAM FRACTION :ABOVE C19	0.03887	0.09407	0.06901	0.0356

Table 20

Catalyst Test Results for Type I,C-FT-HC(3:1)

	AJ	AK	AL	AM	AN	AO	AP
2	TABLE 3.B						
3	C-FT-HC(3:1) TY-I					TABLE 3.B	
4							
5	RUN NO.	33-2-1	33-3-1	33-4-1	33-5-1	33-6-1	33-7-1
6							
7	TEMP. (C)	280	310	340	250	280	310
8	PRESS. (psig)	500	500	500	500	500	500
9	FEED RATE(SCCM)	20	20	20	20	20	20
10	%CO IN FEED	51.3	51.3	51.3	51.8	51.8	51.8
11	%H2 IN FEED	48.7	48.7	48.7	48.2	48.2	48.2
12	MOLES CO FED	2.14	1.86	2.61	2	2.01	2.04
13	MOLES H2 FED	2.03	1.77	2.43	1.86	1.87	1.89
14	% CO CONVERTED	1.42	8.91	53.6	23.7	16	52.4
15	% H2 CONVERTED	13.5	24.7	47.6	15.2	23.2	41.6
16	MOLES CO CONVERTED	0.03	0.127	1.4	0.48	0.32	1.07
17	MOLES H2 CONVERTED	0.27	0.44	1.2	0.28	0.43	0.79
18	TRAPPED HYDROCARBON	0.21	0.84	4.5	0.43	3.31	2.85
19	TOTAL HYDROCARBON	4.86	7	16.9	4.08	9.62	10.6
20	POLYM. PROB. C2-C6 ( )	0.55	0.54	0.45	0.56	0.53	0.49
21	DEG. OF POLYM. C2-C6 ( )	2.24	2.2	1.82	2.26	2.12	1.95
22	CARBON BALANCE	94.9	99	96.6	73.6	98.4	84.2
23	GMS_HC_per_M3_SYNGAS_CONVTD.	173.6	178.4	177.5	113.2	204.7	144.6
24	GMS_C1toC4perM3_SYNGAS_CONVTD.	148.6	145.2	120	77.7	111.6	94.1
25	GMS_C5toC11perM3_SYNGAS_CONVTD.	23.8	27.1	35.6	32.5	62.4	27.2
26	GMS_C12toC19perM3_SYNGAS_CONVTD.	2.9	4.7	11.1	0.3	15.5	12.3
27	GMS_Cabove19perM3_SYNGAS_CONVTD.	0	1.4	10.8	2.8	15.2	11
28	GMS C02/M3 SYNGAS CONVTD.	186.7	321.5	416.5	98.4	316.3	373.2
29	GRAM_FRACTION_:C1_TO_C4	0.85599	0.8139	0.67606	0.6864	0.54518808	0.65076072
30	GRAM_FRACTION_:C5_TO_C11	0.1371	0.15191	0.20056	0.2871	0.30483635	0.18810512
31	GRAM_FRACTION_:C12_TO_C19	0.01671	0.02635	0.06254	0.00265	0.07572057	0.08506224
32	GRAM_FRACTION_:ABOVE_C19	0	0.00785	0.06085	0.02473	0.07425501	0.07607192

	AQ
2	
3	CONTD.
4	
5	33-8-1
6	
7	340
8	500
9	20
10	51.8
11	48.2
12	2.32
13	2.16
14	62.1
15	23
16	1.44
17	0.5
18	0.93
19	12.3
20	0.52
21	2.08
22	74.8
23	151.4
24	129.5
25	15.5
26	2
27	4.4
28	307.7
29	0.85535007
30	0.10237781
31	0.01321004
32	0.02906209