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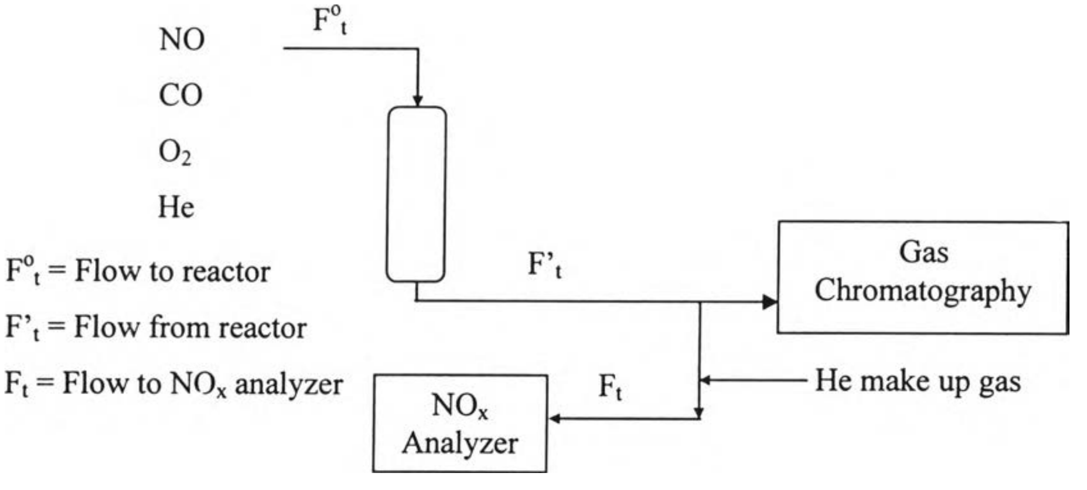
APPENDICES

Appendix A Calculation of CO Conversion



Calculation of CO Conversion

$$\% \text{ CO conversion} = \frac{(y^o_{CO} / y^o_{N2})F^o_t - (y'_{CO} / y'_{N2})F'_t}{(y^o_{CO} / y^o_{N2})F^o_t} * 100$$

From the calibration, $y^o_{CO} / y^o_{N2} = Z_{CO} = 0.0125T_{CO}$

Where, T_{CO} = area of CO / area of N_2

Appendix B Raw data

Table B.1 Activity Test of MFI zeolite

Temperature (degree C)	Flow in (ml/min)	Area of feed gas		Flow out (ml/min)	Area of out gas	
		N2	CO		N2	CO
50	180.00	5057	238437	181.18	5251	244487
100	180.00	5057	238437	181.78	5287	245173
150	180.00	5057	238437	180.48	5618	247291
200	180.00	5057	238437	180.74	5622	248262
250	180.00	5057	238437	180.60	5631	249273
300	180.00	5057	238437	181.39	5579	247981
350	180.00	5057	238437	182.06	5617	247279
400	180.00	5057	238437	181.39	5618	246920
450	180.00	5057	238437	178.34	5449	244095

Temperature (degree C)	Inlet		Outlet		%CO Conversion
	T value	Z value	T value	Z value	
50	47.15	0.5894	46.56	0.582	0.60
100	47.15	0.5894	46.37	0.5797	0.68
150	47.15	0.5894	44.02	0.5502	6.39
200	47.15	0.5894	44.16	0.552	5.96
250	47.15	0.5894	44.27	0.5533	5.80
300	47.15	0.5894	44.45	0.5556	5.00
350	47.15	0.5894	44.02	0.5503	5.56
400	47.15	0.5894	43.95	0.5494	6.06
450	47.15	0.5894	44.80	0.56	5.87

Table B.2 Activity Test of 1%Fe-MFI zeolite via sol-gel process

Temperature (degree C)	Flow in (ml/min)	Area of feed gas		Flow out (ml/min)	Area of out gas	
		N2	CO		N2	CO
50	182.37	5091	238437	181.39	5283	239747
100	182.37	5091	238437	180.90	5277	241520
150	182.37	5091	238437	181.18	5230	241903
200	182.37	5091	238437	180.96	5212	239656
250	182.37	5091	238437	180.72	5276	241409
300	182.37	5091	238437	183.80	5254	239543
350	182.37	5091	238437	181.33	5256	238133
400	182.37	5091	238437	180.60	5244	238289
450	182.37	5091	238437	180.54	5235	232941

Temperature (degree C)	Inlet		Outlet		%CO Conversion
	T value	Z value	T value	Z value	
50	46.84	0.5854	45.38	0.5673	3.63
100	46.84	0.5854	45.77	0.5721	3.06
150	46.84	0.5854	46.25	0.5782	1.89
200	46.84	0.5854	45.98	0.5748	2.58
250	46.84	0.5854	45.76	0.5720	3.19
300	46.84	0.5854	45.59	0.5699	1.89
350	46.84	0.5854	45.31	0.5663	3.81
400	46.84	0.5854	45.44	0.5680	3.92
450	46.84	0.5854	44.50	0.5562	5.95

Table B.3 Activity Test of 3%Fe-MFI zeolite via sol-gel process

Temperature (degree C)	Flow in (ml/min)	Area of feed gas		Flow out (ml/min)	Area of out gas	
		N2	CO		N2	CO
50	182.37	5091	238437	180.42	5272	238744
100	182.37	5091	238437	179.88	5465	240794
150	182.37	5091	238437	178.34	5454	238928
200	182.37	5091	238437	180.84	5442	239451
250	182.37	5091	238437	179.88	5388	238837
300	182.37	5091	238437	184.30	5267	230468
350	182.37	5091	238437	181.39	5346	216567
400	182.37	5091	238437	181.45	5201	181945
450	182.37	5091	238437	180.42	5057	137569

Temperature (degree C)	Inlet		Outlet		%CO Conversion
	T value	Z value	T value	Z value	
50	46.84	0.5854	45.29	0.5661	4.34
100	46.84	0.5854	44.06	0.5508	7.21
150	46.84	0.5854	43.81	0.5476	8.53
200	46.84	0.5854	44.00	0.5500	6.84
250	46.84	0.5854	44.33	0.5541	6.65
300	46.84	0.5854	43.76	0.5470	5.58
350	46.84	0.5854	40.51	0.5064	13.97
400	46.84	0.5854	34.98	0.4373	25.68
450	46.84	0.5854	27.20	0.3400	42.54

Table B.4 Activity Test of 5%Fe-MFI zeolite via sol-gel process

Temperature (degree C)	Flow in (ml/min)	Area of feed gas		Flow out (ml/min)	Area of out gas	
		N2	CO		N2	CO
50	182.37	5091	238437	183.74	5484	232997
100	182.37	5091	238437	182.06	5428	236352
150	182.37	5091	238437	180.48	5318	232916
200	182.37	5091	238437	180.78	5334	234071
250	182.37	5091	238437	180.36	5255	229897
300	182.37	5091	238437	184.74	5292	222033
350	182.37	5091	238437	180.97	5273	199028
400	182.37	5091	238437	180.78	5198	149133
450	182.37	5091	238437	180.72	5094	90780

Temperature (degree C)	Inlet		Outlet		%CO Conversion
	T value	Z value	T value	Z value	
50	46.84	0.5854	42.49	0.5311	8.60
100	46.84	0.5854	43.54	0.5443	7.19
150	46.84	0.5854	43.80	0.5475	7.45
200	46.84	0.5854	43.88	0.5485	7.12
250	46.84	0.5854	43.75	0.5469	7.62
300	46.84	0.5854	41.96	0.5245	9.25
350	46.84	0.5854	37.74	0.4718	20.03
400	46.84	0.5854	28.69	0.3586	39.28
450	46.84	0.5854	17.82	0.2228	62.29

Table B.5 Activity Test of 5%Fe-MFI zeolite via impregnation technique

Temperature (degree C)	Flow in (ml/min)	Area of feed gas		Flow out (ml/min)	Area of out gas	
		N2	CO		N2	CO
50	180.00	5057	238437	182.61	5213	229003
100	180.00	5057	238437	180.66	5198	233500
150	180.00	5057	238437	180.72	5254	234668
200	180.00	5057	238437	180.78	5275	234747
250	180.00	5057	238437	180.84	5196	238836
300	180.00	5057	238437	180.54	5398	233726
350	180.00	5057	238437	180.72	5505	221586
400	180.00	5057	238437	180.67	5285	188217
450	180.00	5057	238437	180.91	5234	138674

Temperature (degree C)	Inlet		Outlet		%CO Conversion
	T value	Z value	T value	Z value	
50	47.15	0.5894	43.93	0.5491	5.48
100	47.15	0.5894	44.92	0.5615	4.38
150	47.15	0.5894	44.66	0.5583	4.89
200	47.15	0.5894	44.50	0.5563	5.21
250	47.15	0.5894	45.97	0.5746	2.06
300	47.15	0.5894	43.30	0.5412	7.89
350	47.15	0.5894	40.25	0.5031	14.29
400	47.15	0.5894	35.61	0.4452	24.19
450	47.15	0.5894	26.49	0.3312	43.52

CURRICULUM VITAE

Name: Mr. Nuttaphong Kritchayanon

Date of Birth: April 11, 1982

Nationality: Thai

University Education:

1999-2003 Bachelor Degree of Science in Material Science, Faculty of Science, Chulalongkorn University, Bangkok, Thailand.

Publications:

1. Kritchayanon, N., Jikarnka, S., Jamieson, A. and Wongkasemjit, S. (2005) Fe-loaded MFI Zeolite Synthesized via Sol-gel Process and Microwave Technique. Chiang Mai Journal of Science, in press.

2. Thanpitcha, T., Kritchayanon, N., Pentrakoon, D., and Pimpan, V. (2003). An Initial Study of Starch-g-polystyrene Foam Prepared by a Steaming Process. Journal of Metals, Material and Minerals. Vol. 12(2), pp. 1-6.

Presentation:

1. Kritchayanon, N., Jikarnka, S., Jamieson, A. and Wongkasemjit, S. (2004) Fe-loaded MFI Zeolite Synthesized via Sol-gel Process and Microwave Technique. Paper presented at The International Conference on Smart/Intelligent Materials and Nanotechnology, Chiang Mai, Thailand.