Air Products

9.0 TABLES

TABLE 1

SLURRY RUN SUMMARY

7075-12-81

14.70 wt% slurry of Fe_2O_3/2%Al_2O_3/·5%K_2O/1%CaO

Sample #	Time h	P psig	T °C	GHSV h^{-1}	ν min^{-1}	$X_{CO + H_2}$	X_{CO}	X_{H_2}	S	U
14	104.9	460	221.9	143.8	800	0.064	0.032	0.103	0.789	2.52
17	129.1	450	219.7	146.7	1600	0.059	0.029	0.102	0.692	2.42
23	238.7	450	224.3	146.4	1600	0.094	0.068	0.131	0.715	1.37
27	262.6	450	224.8	145.1	800	0.058	0.032	0.094	0.715	2.09
31	286.7	450	250.9	146.5	800	0.226	0.198	0.265	0.715	0.955
35	310.7	460	247.5	146.2	1600	0.247	0.221	0.283	0.716	0.920
47	406.8	455	276.5	144.7	1600	0.508	0.535	0.471	0.719	0.634
51	430.8	455	273.0	146.9	800	0.286	0.289	0.281	0.719	0.700
55	453.3	455	280.0	285.2	800	0.180	0.183	0.177	0.722	0.699
59	477.3	455	249.7	147.7	1600	0.107	0.094	0.127	0.712	0.965
62	549.7	460	251.5	155.7	1600	0.090	0.065	0.159	0.363	0.889
65	573.7	460	253.3	155.7	800	0.091	0.069	0.153	0.363	0.805
68	597.5	455	250.9	312.1	800	0.062	0.061	0.066	0.345	0.372
71	621.5	450	281.3	183.4	800	0.277	0.236	0.393	0.353	0.587
74	645.7	450	281.4	155.0	1600	0.285	0.237	0.419	0.356	0.629
82	717.6	440	280.7	148.0	1600	0.139	0.136	0.144	0.692	0.730
84	741.3	450	220.9	146.5	800	0.010	0.007	0.014	0.710	1.50

IDENTIFICATION

TABLE 2

Run # : 7075-12-81	Baseline Catalyst: Fe_2O_3/2%Al_2O_3/ 0.5%K_2O/1%CaO	Time on Stream: 129.1 h
Sample #: 17	Loading : 464 mL 14.7 wt% slurry	Reactor #2 : 1000 mL slurry reactor

PROCESS DATA

Inlet CO/H_2 Ratio : 1.45	GHSV h^{-1}: 146.7 m^3/kg cat/h: 0.927
Inlet CO rate mol/min: 2.99×10^{-2}	P psig : 450
Inlet H_2 rate mol/min: 2.07×10^{-2}	T °C : 219.7
Impeller stir speed min^{-1}: 1600	Activity mol syngas/kg cat/h: 2.44

PRODUCT DISTRIBUTION, MOL %

C_1 : 5.80	C_{18+}: 0.35
C_2-C_4 : 5.75	CO_2 : 26.15
C_5-C_{11} : 2.79	H_2O : 57.14
C_{12}-C_{17}: 0.58	Oxygenates: 1.25

MOL % CONVERSION

Product / Reactant	C_1	C_2-C_4	C_5-C_{11}	C_{12}-C_{17}	C_{18+}	CO_2	H_2O	Oxygenates	Sum Comp. Conv.	Obs. Tot. Conv.
CO	0.34	0.97	1.02	0.48	0.44	1.52	-	0.23	4.99	2.91
H_2	0.98	1.51	1.60	0.72	0.66	-	4.80	0.44	10.72	10.18

TABLE 3

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 17

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
1	11.29	38.00	0.00	0.00	0.00	0.00
2	1.45	2.60	5.83	11.21	0.00	0.00
3	2.00	2.45	8.76	11.23	0.00	0.00
4	1.48	1.37	7.02	6.76	2.22	2.06
5	2.53	1.90	7.27	5.60	0.00	0.00
6	1.21	0.76	0.00	0.00	6.02	3.77
7	2.86	1.54	2.10	1.16	0.48	0.26
8	0.88	0.41	1.29	0.62	2.09	0.99
9	0.46	0.03	1.08	0.07	1.89	0.13
10	0.20	0.08	0.35	0.14	0.54	0.20
11	0.34	0.12	0.56	0.20	0.84	0.29
12	0.54	0.17	0.81	0.26	1.09	0.35
13	0.71	0.21	0.85	0.25	0.97	0.28
14	0.73	0.20	0.91	0.25	1.04	0.28
15	0.63	0.16	0.86	0.22	0.94	0.24
16	0.60	0.14	0.65	0.16	0.86	0.20
17	0.55	0.12	0.51	0.12	0.76	0.17
18	0.43	0.09	0.40	0.08	0.68	0.14
19	0.50	0.10	0.28	0.06	0.65	0.13
20	0.80	0.15	0.00	0.00	0.65	0.12
21	0.60	0.11	0.00	0.00	0.62	0.11
22	0.49	0.08	0.00	0.00	0.76	0.13

TABLE 3 (cont'd)

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 17

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
23	0.54	0.09	0.00	0.00	0.80	0.13
24	0.81	0.13	0.00	0.00	0.99	0.16
25	0.99	0.15	0.00	0.00	0.00	0.00
26	0.13	0.02	0.00	0.00	0.80	0.12
27	0.46	0.07	0.00	0.00	0.52	0.07
28	0.01	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 4

OXYGENATE WEIGHT % OF AQUEOUS PHASE

Run # : 7075-12-B1

Sample #: 17

CARBON #	ALCOHOL	ALDEHYDE	KETONE	ACID
1	0.3531	0.0000	0.0000	0.0000
2	1.5458	0.0283	0.0000	0.7369
3	1.0993	0.0000	0.0853	0.0000
4	1.0684	0.0000	0.0451	0.0000
5	0.5005	0.0000	0.0251	0.0000
6	1.1121	0.0000	0.0000	0.0000

TABLE 5

IDENTIFICATION

Run # : 7075-12-81	Baseline Catalyst: Fe_2O_3/2%Al_2O_3/ 0.5%K_2O/1%CaO	Time on Stream: 238.7 h
Sample #: 23	Loading : 464 mL 14.7 wt% slurry	Reactor #2 : 1000 mL slurry reactor

PROCESS DATA

Inlet CO/H_2 Ratio : 1.399	GHSV h^{-1}: 146.4 m^3/kg cat/h: 0.926
Inlet CO rate mol/min: 2.95×10^{-2}	P psig : 450
Inlet H_2 rate mol/min: 2.11×10^{-2}	T °C : 224.3
Impeller stir speed min^{-1}: 1600	Activity mol syngas/kg cat/h: 3.90

PRODUCT DISTRIBUTION, MOL %

C_1 : 5.44	C_{18+}: 0.22
C_2-C_4 : 6.75	CO_2 : 26.63
C_5-C_{11} : 1.54	H_2O : 56.32
C_{12}-C_{17}: 0.38	Oxygenates: 1.31

MOL % CONVERSION

Product / Reactant	C_1	C_2-C_4	C_5-C_{11}	C_{12}-C_{17}	C_{18+}	CO_2	H_2O	Oxygenates	Sum Comp. Conv.	Obs. Tot. Conv.
CO	0.36	1.27	0.63	0.36	0.33	1.78	-	0.46	5.18	6.84
H_2	0.10	1.93	0.95	0.52	0.48	-	5.26	0.88	11.03	13.08

TABLE 6

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 23

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
1	13.58	37.93	0.00	0.00	0.00	0.00
2	2.72	4.06	9.33	14.89	0.00	0.00
3	4.51	4.58	12.25	13.04	0.00	0.00
4	3.61	2.78	9.67	7.71	0.04	0.03
5	3.15	1.95	6.91	4.41	0.41	0.25
6	2.54	1.32	0.00	0.00	0.00	0.00
7	0.82	0.37	0.65	0.30	0.48	0.21
8	0.31	0.12	0.48	0.19	0.93	0.37
9	0.24	0.04	0.53	0.09	1.01	0.16
10	0.26	0.08	0.59	0.19	0.55	0.17
11	0.37	0.11	0.65	0.19	0.86	0.25
12	0.51	0.13	0.79	0.21	0.99	0.26
13	0.66	0.16	0.73	0.18	0.74	0.18
14	0.67	0.15	0.76	0.17	0.73	0.17
15	0.59	0.13	0.69	0.15	0.65	0.14
16	0.59	0.12	0.54	0.11	0.57	0.11
17	0.56	0.10	0.45	0.08	0.54	0.10
18	0.43	0.08	0.35	0.06	0.51	0.09
19	0.48	0.08	0.27	0.05	0.50	0.08
20	0.69	0.11	0.00	0.00	0.49	0.08
21	0.53	0.08	0.00	0.00	0.43	0.07
22	0.40	0.06	0.00	0.00	0.55	0.08

TABLE 6 (cont'd)

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 23

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
23	0.42	0.06	0.00	0.00	0.62	0.09
24	0.79	0.10	0.00	0.00	0.60	0.08
25	0.65	0.08	0.00	0.00	0.16	0.02
26	0.14	0.02	0.00	0.00	0.85	0.10
27	0.42	0.05	0.00	0.00	0.48	0.06
28	0.00	0.00	0.00	0.00	0.02	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 7

OXYGENATE WEIGHT % OF AQUEOUS PHASE

RUN # : 7075-12-B1

SAMPLE #: 23

CARBON #	ALCOHOL	ALDEHYDE	KETONE	ACID
1	0.0000	0.0000	0.0000	0.0000
2	1.8341	0.0152	0.0000	0.9185
3	1.1754	0.0000	0.0572	0.0000
4	1.1166	0.0000	0.0453	0.0000
5	0.6757	0.0000	0.0202	0.0000
6	1.4490	0.0000	0.0000	0.0000

TABLE 8

IDENTIFICATION

Run # :7075-12-B1	Catalyst: Baseline Fe_2O_3/2%Al_2O_3/ 0.5% K_2O/1%CaO	Time on Stream: 262.6 h
Sample #: 27	Loading : 464 mL 14.7 wt% slurry	Reactor #2 : 1000 mL slurry reactor

PROCESS DATA

Inlet CO/H_2 Ratio : 1.399	GHSV h^{-1}: 145.1 m^3/kg cat/h: 0.917
Inlet CO rate mol/min: 2.92×10^{-2}	P psig : 450
Inlet H_2 rate mol/min: 2.09×10^{-2}	T °C : 224.8
Impeller stir speed min^{-1}: 800	Activity mol syngas/kg cat/h: 2.38

PRODUCT DISTRIBUTION, MOL %

C_1 : 6.58	C_{18+}: 0.41
C_2-C_4 : 7.31	CO_2 : 27.98
C_5-C_{11} : 2.16	H_2O : 52.29
C_{12}-C_{17}: 0.74	Oxygenates: 1.02

MOL % CONVERSION

Product / Reactant	C_1	C_2-C_4	C_5-C_{11}	C_{12}-C_{17}	C_{18+}	CO_2	H_2O	Oxygen-ates	Sum Comp. Conv.	Obs. Tot. Conv.
CO	0.33	1.03	0.71	0.53	0.45	1.41	-	0.30	4.78	3.23
H_2	0.93	1.60	1.06	0.78	0.66	-	3.70	0.59	9.30	9.41

TABLE 9

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 27

CARBON #	n-alkanes Wt %	n-alkanes Mole %	1-alkene Wt %	1-alkene Mole %	Branched Isomers Wt %	Branched Isomers Mole %
1	11.94	38.23	0.00	0.00	0.00	0.00
2	2.36	4.03	7.19	13.15	0.00	0.00
3	3.79	4.41	9.46	11.55	0.00	0.00
4	3.54	3.13	6.82	6.24	0.00	0.00
5	0.35	0.25	7.52	5.51	0.16	0.11
6	0.00	0.00	0.00	0.00	3.74	2.23
7	0.86	0.44	1.00	0.53	0.92	0.47
8	0.41	0.19	0.60	0.27	1.41	0.63
9	0.30	0.05	0.67	0.11	1.44	0.24
10	0.35	0.13	0.76	0.28	0.74	0.27
11	0.51	0.17	0.90	0.30	1.18	0.39
12	0.72	0.22	1.09	0.33	1.37	0.41
13	0.90	0.25	1.08	0.30	1.09	0.30
14	0.89	0.23	1.12	0.29	1.06	0.27
15	0.81	0.20	1.02	0.25	0.95	0.23
16	0.80	0.18	0.85	0.19	0.83	0.19
17	0.75	0.16	0.72	0.15	0.76	0.16
18	0.59	0.12	0.56	0.11	0.69	0.14
19	0.61	0.12	0.43	0.08	0.65	0.12
20	0.94	0.17	0.00	0.00	0.63	0.11
21	0.78	0.14	0.00	0.00	0.54	0.09
22	0.60	0.10	0.00	0.00	0.70	0.12

TABLE 9 (cont'd)

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 27

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
23	0.60	0.10	0.00	0.00	0.79	0.12
24	0.94	0.14	0.00	0.00	0.75	0.11
25	0.63	0.09	0.00	0.00	0.32	0.05
26	0.27	0.04	0.00	0.00	0.96	0.13
27	0.54	0.07	0.00	0.00	0.57	0.08
28	0.08	0.01	0.00	0.00	0.06	0.01
29	0.01	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 10

OXYGENATE WEIGHT % OF AQUEOUS PHASE

RUN # : 7075-12-B1

SAMPLE #: 27

CARBON #	ALCOHOL	ALDEHYDE	KETONE	ACID
1	0.3538	0.0000	0.0000	0.0000
2	1.4872	0.0154	0.0000	0.5476
3	0.9430	0.0000	0.0501	0.0000
4	0.8782	0.0000	0.0371	0.0000
5	0.5472	0.0000	0.0149	0.0000
6	1.0632	0.0000	0.0000	0.0000

TABLE 11

IDENTIFICATION

Run # : 7075-12-B1	Catalyst: Baseline Fe_2O_3/2%Al_2O_3/ 0.5%K_2O/1%CaO	Time on Stream: 286.7 h
Sample #: 31	Loading : 464 mL 14.7 wt% slurry	Reactor #2 : 1000 mL slurry reactor

PROCESS DATA

Inlet CO/H_2 Ratio : 1.398	GHSV h^{-1}: 146.5 m^3/kg cat/h: 0.926
Inlet CO rate mol/min: 2.95×10^{-2}	P psig : 450
Inlet H_2 rate mol/min: 2.11×10^{-2}	T °C : 250.9
Impeller stir speed min^{-1}: 800	Activity mol syngas/kg cat/h: 9.34

PRODUCT DISTRIBUTION, MOL %

C_1 : 4.52	C_{18+}: 0.24
C_2-C_4 : 6.48	CO_2 : 50.55
C_5-C_{11} : 1.98	H_2O : 31.93
C_{12}-C_{17}: 0.56	Oxygenates: 1.45

MOL % CONVERSION

Product / Reactant	C_1	C_2-C_4	C_5-C_{11}	C_{12}-C_{17}	C_{18+}	CO_2	H_2O	Oxygen-ates	Sum Comp. Conv.	Obs. Tot. Conv.
CO	0.73	2.97	2.11	1.27	0.82	8.16	-	1.38	17.45	19.83
H_2	2.04	4.48	3.12	1.86	1.20	-	7.21	2.73	22.64	26.46

TABLE 12

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-31

SAMPLE #: 31

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
1	10.14	32.80	0.00	0.00	0.00	0.00
2	2.59	4.47	7.53	13.93	0.00	0.00
3	3.14	3.69	11.52	14.20	0.00	0.00
4	2.49	2.22	8.95	8.27	0.26	0.23
5	0.42	0.30	7.93	5.86	0.25	0.18
6	0.00	0.00	0.00	0.00	3.87	2.33
7	0.00	0.00	2.63	1.39	0.67	0.35
8	0.70	0.32	1.12	0.52	1.39	0.63
9	0.53	0.10	1.28	0.24	1.58	0.29
10	0.43	0.16	1.10	0.41	0.80	0.29
11	0.61	0.20	1.19	0.40	1.26	0.42
12	0.62	0.19	1.27	0.39	1.35	0.41
13	0.84	0.24	1.17	0.33	1.18	0.33
14	0.80	0.21	1.07	0.28	0.99	0.26
15	0.69	0.17	0.91	0.22	0.83	0.20
16	0.66	0.15	0.71	0.16	0.69	0.16
17	0.60	0.13	0.57	0.12	0.60	0.13
18	0.48	0.10	0.00	0.00	0.94	0.19
19	0.49	0.09	0.00	0.00	0.78	0.15
20	0.71	0.13	0.00	0.00	0.42	0.08
21	0.57	0.10	0.00	0.00	0.34	0.06
22	0.45	0.07	0.00	0.00	0.43	0.07

TABLE 12(cont'd)

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 31

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
23	0.42	0.07	0.00	0.00	0.51	0.08
24	0.67	0.10	0.00	0.00	0.49	0.08
25	0.70	0.10	0.00	0.00	0.17	0.03
26	0.13	0.02	0.00	0.00	0.68	0.10
27	0.33	0.05	0.00	0.00	0.38	0.05
28	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 13

OXYGENATE WEIGHT % OF AQUEOUS PHASE

RUN # : 7075-12-B1

SAMPLE #: 31

CARBON #	ALCOHOL	ALDEHYDE	KETONE	ACID
1	0.5318	0.0000	0.0000	0.0000
2	3.8928	0.0261	0.0000	1.4553
3	2.0653	0.0000	0.1323	0.0000
4	1.4891	0.0000	0.0849	0.0000
5	0.8085	0.0000	0.0384	0.0000
6	1.8515	0.0000	0.0000	0.0000

TABLE 14

IDENTIFICATION

Run # : 7075-12-B1	Baseline Catalyst: Fe_2O_3/2%Al_2O_3/ 0.5%K_2O/1%CaO	Time on Stream: 310.7 h
Sample #: 35	Loading : 464 mL 14.7 wt% slurry	Reactor #2 : 1000 mL slurry reactor

PROCESS DATA

Inlet CO/H_2 Ratio : 1.396	GHSV h^{-1}: 146.2 m^3/kg cat/h: 0.924
Inlet CO rate mol/min: 2.94×10^{-2}	P psig : 460
Inlet H_2 rate mol/min: 2.11×10^{-2}	T °C : 247.5
Impeller stir speed min^{-1}: 1600	Activity mol syngas/kg cat/h: 10.21

PRODUCT DISTRIBUTION, MOL %

C_1 : 3.81	C_{18+}: 0.25
C_2-C_4 : 6.20	CO_2 : 52.43
C_5-C_{11} : 3.18	H_2O : 30.20
C_{12}-C_{17}: 0.54	Oxygenates: 1.23

MOL % CONVERSION

Product / Reactant	C_1	C_2-C_4	C_5-C_{11}	C_{12}-C_{17}	C_{18+}	CO_2	H_2O	Oxygenates	Sum Comp. Conv.	Obs. Tot. Conv.
CO	0.64	2.97	3.49	1.28	0.92	8.80	-	1.30	19.39	22.10
H_2	1.78	4.47	5.17	1.86	1.34	-	7.06	2.54	24.24	28.38

TABLE 15

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-31

SAMPLE #: 35

CARBON #	n-alkanes Wt %	n-alkanes Mole %	1-alkene Wt %	1-alkene Mole %	Branched Isomers Wt %	Branched Isomers Mole %
1	7.39	27.26	0.00	0.00	0.00	0.00
2	1.94	3.82	6.25	13.19	0.00	0.00
3	2.75	3.70	9.18	12.91	0.00	0.00
4	2.31	2.35	7.75	8.17	0.17	0.17
5	0.43	0.36	8.15	6.88	0.08	0.06
6	0.00	0.00	2.80	1.97	5.60	3.85
7	0.00	0.00	4.67	2.82	2.41	1.42
8	1.06	0.55	2.13	1.12	2.91	1.51
9	0.77	0.08	2.04	0.20	2.61	0.26
10	0.32	0.13	0.86	0.36	0.66	0.27
11	0.43	0.16	0.92	0.35	1.04	0.40
12	0.59	0.21	1.00	0.35	1.14	0.40
13	0.68	0.22	0.94	0.31	0.88	0.28
14	0.65	0.19	0.89	0.27	0.83	0.25
15	0.56	0.16	0.76	0.21	0.73	0.20
16	0.55	0.14	0.59	0.16	0.63	0.16
17	0.51	0.13	0.48	0.12	0.55	0.14
18	0.42	0.10	0.37	0.09	0.48	0.11
19	0.43	0.10	0.27	0.06	0.43	0.10
20	0.62	0.13	0.00	0.00	0.39	0.08
21	0.47	0.09	0.00	0.00	0.36	0.07
22	0.44	0.08	0.00	0.00	0.37	0.07

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 35

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
23	0.41	0.07	0.00	0.00	0.46	0.08
24	0.63	0.11	0.00	0.00	0.45	0.08
25	0.49	0.08	0.00	0.00	0.20	0.03
26	0.10	0.02	0.00	0.00	0.72	0.12
27	0.36	0.06	0.00	0.00	0.39	0.06
28	0.05	0.01	0.00	0.00	0.05	0.01
29	0.01	0.00	0.00	0.00	0.02	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 16

OXYGENATE WEIGHT % OF AQUEOUS PHASE

RUN # : 7075-12-B1

SAMPLE #: 35

CARBON #	ALCOHOL	ALDEHYDE	KETONE	ACID
1	0.4559	0.0000	0.0000	0.0000
2	3.4016	0.0243	0.0000	1.4877
3	1.8454	0.0000	0.1290	0.0000
4	1.3428	0.0000	0.0844	0.0000
5	0.7167	0.0000	0.0349	0.0000
6	1.7981	0.0000	0.0000	0.0000

TABLE 17

IDENTIFICATION

Run # :7075-12-81	Baseline Catalyst: Fe_2O_3/2%Al_2O_3/ 0.5%K_2O/1%CaO	Time on Stream: 406.8 h
Sample #: 47	Loading :464 mL 14.7 wt% slurry	Reactor #2 :1000 mL slurry reactor

PROCESS DATA

Inlet CO/H_2 Ratio : 1.392	GHSV h^{-1}: 144.7 m^3/kg cat/h: 0.915
Inlet CO rate mol/min: 2.91×10^{-2}	P psig : 455
Inlet H_2 rate mol/min: 2.09×10^{-2}	T °C : 276.5
Impeller stir speed min^{-1}: 1600	Activity mol syngas/kg cat/h: 20.76

PRODUCT DISTRIBUTION, MOL %

C_1 : 4.29	C_{18+}: 0.34
C_2-C_4 : 6.67	CO_2 : 75.78
C_5-C_{11} : 4.00	H_2O : 5.38
C_{12}-C_{17}: 0.79	Oxygenates: 0.23

MOL % CONVERSION

Product / Reactant	C_1	C_2-C_4	C_5-C_{11}	C_{12}-C_{17}	C_{18+}	CO_2	H_2O	Oxygenates	Sum Comp. Conv.	Obs. Tot. Conv.
CO	1.50	6.62	9.48	3.78	2.69	26.41	-	1.96	52.43	53.46
H_2	4.17	9.84	14.16	5.52	3.92	-	2.61	4.04	44.26	47.15

TABLE 18

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7072-12-B1

SAMPLE #: 47

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
1	6.76	26.68	0.00	0.00	0.00	0.00
2	2.05	4.31	5.18	11.70	0.00	0.00
3	1.43	2.05	9.08	13.66	0.00	0.00
4.	1.45	1.57	7.03	7.93	0.18	0.20
5	0.44	0.39	8.49	7.67	0.38	0.33
6	0.00	0.00	0.00	0.00	6.71	4.93
7	0.00	0.00	3.14	2.02	2.90	1.83
8	0.82	0.46	2.04	1.15	2.90	1.61
9	0.87	0.20	2.31	0.54	2.88	0.66
10	0.50	0.22	1.30	0.59	1.53	0.68
11	0.87	0.35	1.25	0.51	1.75	0.71
12	0.85	0.32	1.27	0.48	1.52	0.57
13	0.97	0.33	1.09	0.38	1.26	0.43
14	0.99	0.32	0.99	0.32	1.28	0.41
15	0.70	0.21	0.64	0.19	0.94	0.28
16	0.56	0.16	0.24	0.07	0.61	0.17
17	0.49	0.13	0.12	0.03	0.51	0.13
18	0.36	0.09	0.00	0.00	0.55	0.14
19	0.53	0.12	0.00	0.00	0.54	0.13
20	0.55	0.12	0.00	0.00	0.51	0.12
21	0.31	0.07	0.00	0.00	0.45	0.10
22	0.23	0.05	0.00	0.00	0.53	0.11

TABLE 18 (cont'd)

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7072-12-B1

SAMPLE #: 47

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
23	0.31	0.06	0.00	0.00	0.60	0.12
24	0.95	0.18	0.00	0.00	0.62	0.12
25	0.87	0.16	0.00	0.00	0.01	0.00
26	0.10	0.02	0.00	0.00	1.20	0.21
27	0.64	0.11	0.00	0.00	0.71	0.12
28	0.01	0.00	0.00	0.00	0.01	0.00
29	0.01	0.00	0.00	0.00	0.01	0.00
30	0.01	0.00	0.00	0.00	0.02	0.00

TABLE 19

OXYGENATE WEIGHT % OF AQUEOUS PHASE

RUN # : 7075-12-B1

SAMPLE #: 47

CARBON #	ALCOHOL	ALDEHYDE	KETONE	ACID
1	0.2292	0.0000	0.0000	0.0000
2	5.3776	0.0151	0.0000	1.0138
3	2.1222	0.0000	0.1131	0.0000
4	1.0561	0.0000	0.0851	0.0000
5	0.4430	0.0000	0.0470	0.0000
6	0.7391	0.0000	0.0000	0.0000

TABLE 20

IDENTIFICATION

Run # :7075-12-81	Catalyst: Baseline Fe_2O_3/2%Al_2O_3/ 0.5%K_2O/1%CaO	Time on Stream: 430.8h
Sample #:51	Loading : 464 mL 14.7 wt% slurry	Reactor #2 : 1000 mL slurry reactor

PROCESS DATA

Inlet CO/H_2 Ratio : 1.391	GHSV h^{-1}: 146.9 m^3/kg cat/h: 0.929
Inlet CO rate mol/min: 2.95×10^{-2}	P psig : 455
Inlet H_2 rate mol/min: 2.12×10^{-2}	T °C : 273.0
Impeller stir speed min^{-1}: 800	Activity mol syngas/kg cat/h: 11.85

PRODUCT DISTRIBUTION, MOL %

C_1 : 4.80	C_{18+}: 0.63
C_2-C_4 : 7.47	CO_2 : 71.52
C_5-C_{11} : 3.50	H_2O : 7.31
C_{12}-C_{17}: 1.09	Oxygenates: 0.89

MOL % CONVERSION

Product / Reactant	C_1	C_2-C_4	C_5-C_{11}	C_{12}-C_{17}	C_{18+}	CO_2	H_2O	Oxygenates	Sum Comp. Conv.	Obs. Tot. Conv.
CO	0.41	4.02	4.14	2.90	2.72	13.56	-	1.61	29.87	28.90
H_2	2.53	5.99	6.05	4.25	3.95	-	1.93	3.21	27.91	28.14

TABLE 21

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 51

CARBON #	n-alkanes Wt %	n-alkanes Mole %	1-alkene Wt %	1-alkene Mole %	Branched Isomers Wt %	Branched Isomers Mole %
1	6.87	27.46	0.00	0.00	0.00	0.00
2	1.99	4.25	5.57	12.73	0.00	0.00
3	1.82	2.64	8.51	12.97	0.00	0.00
4	1.32	1.45	7.38	8.43	0.21	0.23
5	0.72	0.64	11.80	10.78	0.22	0.19
6	0.00	0.00	1.05	0.80	2.10	1.56
7	0.68	0.44	0.71	0.47	1.27	0.81
8	0.40	0.22	0.86	0.49	1.36	0.76
9	0.36	0.09	1.12	0.28	1.38	0.34
10	0.44	0.20	0.85	0.39	0.80	0.36
11	0.69	0.28	0.95	0.39	1.19	0.49
12	0.79	0.30	1.15	0.44	1.49	0.56
13	1.15	0.40	0.98	0.34	1.28	0.44
14	1.25	0.40	1.05	0.34	1.54	0.50
15	1.20	0.36	0.94	0.29	1.49	0.45
16	1.18	0.33	0.49	0.14	1.28	0.36
17	0.88	0.23	0.16	0.04	0.98	0.26
18	0.57	0.14	0.00	0.00	0.91	0.23
19	0.80	0.19	0.00	0.00	0.87	0.21
20	0.85	0.19	0.00	0.00	0.84	0.19
21	0.48	0.10	0.00	0.00	0.73	0.16
22	0.35	0.07	0.00	0.00	0.87	0.19

TABLE 21 (cont'd)

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-31

SAMPLE #: 51

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
23	0.50	0.10	0.00	0.00	0.99	0.20
24	1.56	0.30	0.00	0.00	1.07	0.20
25	1.45	0.26	0.00	0.00	0.08	0.01
26	0.20	0.04	0.00	0.00	1.97	0.35
27	1.11	0.19	0.00	0.00	1.20	0.20
28	0.07	0.01	0.00	0.00	0.06	0.01
29	0.05	0.01	0.00	0.00	0.05	0.01
30	0.04	0.01	0.00	0.00	0.12	0.02

TABLE 22

OXYGENATE WEIGHT % OF AQUEOUS PHASE

RUN # : 7075-12-B1

SAMPLE #: 51

CARBON #	ALCOHOL	ALDEHYDE	KETONE	ACID
1	0.5573	0.0000	0.0000	0.0000
2	9.3200	0.0383	0.0000	0.0000
3	3.7829	0.0000	0.2050	0.0000
4	2.0397	0.0000	0.1337	0.0000
5	11.1301	0.0000	0.0734	0.0000
6	3.0172	0.0000	0.0000	0.0000

TABLE 23

IDENTIFICATION

Run # :7075-12-B1	Baseline Catalyst: Fe_2O_3/2%Al_2O_3/ 0.5%K_2O/1%CaO	Time on Stream: 453.3
Sample #: 55	Loading :464 mL 14.7 wt% slurry	Reactor #2 : 1000 mL slurry reactor

PROCESS DATA

Inlet CO/H_2 Ratio : 1.386	GHSV h^{-1}: 285.2 m^3/kg cat/h: 1.803
Inlet CO rate mol/min: 5.72×10^{-2}	P psig : 455
Inlet H_2 rate mol/min: 4.13×10^{-2}	T °C : 280.0
Impeller stir speed min^{-1}: 800	Activity mol syngas/kg cat/h: 14.51

PRODUCT DISTRIBUTION, MOL %

C_1 : 5.25	C_{18+}: 1.26
C_2-C_4 : 7.38	CO_2 : 66.67
C_5-C_{11} : 3.76	H_2O : 10.97
C_{12}-C_{17}: 1.73	Oxygenates: 0.05

MOL % CONVERSION

Product / Reactant	C_1	C_2-C_4	C_5-C_{11}	C_{12}-C_{17}	C_{18+}	CO_2	H_2O	Oxygen-ates	Sum Comp. Conv.	Obs. Tot. Conv.
CO	0.63	2.45	2.99	2.98	3.20	7.99	-	0.72	20.95	18.27
H_2	1.74	3.63	4.38	4.32	4.64	-	1.82	1.49	22.03	17.70

TABLE 24

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 55

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
1	5.73	27.10	0.00	0.00	0.00	0.00
2	1.35	3.41	4.80	12.98	0.00	0.00
3	1.93	3.31	5.94	10.71	0.00	0.00
4	0.34	0.45	5.25	7.10	0.07	0.09
5	0.37	0.39	8.23	8.90	0.21	0.23
6	0.00	0.00	0.00	0.00	2.87	2.53
7	0.71	0.54	0.88	0.68	0.61	0.46
8	0.46	0.31	0.92	0.62	1.01	0.67
9	0.38	0.14	1.19	0.43	1.26	0.45
10	0.50	0.27	1.26	0.68	0.86	0.46
11	0.65	0.31	1.36	0.67	1.38	0.67
12	0.69	0.31	1.53	0.69	1.62	0.72
13	1.05	0.43	1.38	0.57	1.46	0.60
14	1.13	0.43	1.32	0.51	1.41	0.54
15	1.18	0.42	1.19	0.43	1.34	0.48
16	1.66	0.55	1.03	0.35	1.35	0.45
17	2.13	0.67	0.89	0.28	1.52	0.48
18	2.80	0.83	0.00	0.00	1.51	0.45
19	2.56	0.72	0.00	0.00	1.38	0.39
20	2.17	0.58	0.00	0.00	1.20	0.32
21	1.55	0.40	0.00	0.00	1.00	0.26
22	1.16	0.28	0.00	0.00	1.01	0.25

TABLE 24 (cont'd)

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 55

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
23	1.01	0.24	0.00	0.00	1.02	0.24
24	1.48	0.33	0.00	0.00	0.95	0.21
25	1.10	0.24	0.00	0.00	0.47	0.10
26	0.15	0.03	0.00	0.00	1.51	0.31
27	0.68	0.13	0.00	0.00	0.82	0.16
28	0.01	0.00	0.00	0.00	0.03	0.01
29	0.00	0.00	0.00	0.00	0.02	0.00
30	0.01	0.00	0.00	0.00	0.01	0.00

TABLE 25

OXYGENATE WEIGHT % OF AQUEOUS PHASE

RUN # : 7075-12-B1

SAMPLE #: 55

CARBON #	ALCOHOL	ALDEHYDE	KETONE	ACID
1	0.0000	0.0000	0.0000	0.0000
2	0.5628	0.0030	0.0000	0.2167
3	0.2384	0.0000	0.0224	0.0000
4	0.1167	0.0000	0.0062	0.0000
5	0.0538	0.0000	0.0042	0.0000
6	0.1950	0.0000	0.0000	0.0000