

TABLE 26

IDENTIFICATION

Run # : 7075-12-81	Catalyst: Baseline $\text{Fe}_2\text{O}_3/2\%\text{Al}_2\text{O}_3/$ $0.5\%\text{K}_2\text{O}/1\%\text{CaO}$	Time on Stream: 477.3 h
Sample #: 59	Loading : 464 mL 14.7 wt% slurry	Reactor #2 : 1000 mL slurry reactor

PROCESS DATA

Inlet CO/H ₂ Ratio : 1.404	GHSV h ⁻¹ : 147.7 m ³ /kg cat/h: 0.933
Inlet CO rate mol/min: 2.98×10^{-2}	P psig : 455
Inlet H ₂ rate mol/min: 2.12×10^{-2}	T °C : 249.7
Impeller stir speed min ⁻¹ : 1600	Activity mol syngas/kg cat/h: 4.48

PRODUCT DISTRIBUTION, MOL %

C ₁ : 6.99	C ₁₈₊ : 0.87
C ₂ -C ₄ : 7.42	CO ₂ : 56.95
C ₅ -C ₁₁ : 3.32	H ₂ O : 10.65
C ₁₂ -C ₁₇ : 1.09	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 ₂ O	Oxygen- ates	Sum Comp. Conv.	Obs. Tot. Conv.
CO	0.55	1.64	1.71	1.20	1.54	4.46	-	0.66	11.75	9.36
H ₂	1.54	2.50	2.54	1.77	2.25	-	2.16	1.30	14.06	12.69

TABLE 27

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 59

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
1	9.09	35.52	0.00	0.00	0.00	0.00
2	1.35	2.82	5.42	12.11	0.00	0.00
3	3.82	5.43	6.30	9.37	0.00	0.00
4	1.22	1.32	5.97	6.66	0.00	0.00
5	0.34	0.29	8.26	7.38	0.00	0.00
6	0.00	0.00	0.00	0.00	3.64	2.64
7	0.00	0.00	1.83	1.16	1.17	0.73
8	0.49	0.27	1.01	0.57	1.49	0.82
9	0.43	0.11	1.22	0.30	1.59	0.39
10	0.39	0.17	1.16	0.52	0.77	0.34
11	0.48	0.19	1.17	0.47	1.29	0.52
12	0.73	0.27	1.23	0.46	1.39	0.51
13	0.73	0.25	1.25	0.43	1.12	0.38
14	0.74	0.24	1.17	0.37	1.05	0.33
15	0.77	0.23	1.04	0.31	0.94	0.28
16	0.94	0.26	0.90	0.25	0.85	0.23
17	1.18	0.31	0.78	0.2	0.83	0.22
18	1.82	0.45	0.10	0.02	0.80	0.20
19	1.72	0.40	0.00	0.00	0.70	0.16
20	1.48	0.33	0.00	0.00	0.61	0.14
21	1.25	0.26	0.00	0.00	0.55	0.12
22	1.11	0.22	0.00	0.00	0.56	0.11

TABLE 27 (cont'd)

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-31

SAMPLE #: 59

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
23	1.06	0.20	0.00	0.00	0.61	0.12
24	1.01	0.19	0.00	0.00	0.37	0.07
25	1.04	0.18	0.00	0.00	0.36	0.06
26	1.07	0.18	0.00	0.00	0.37	0.06
27	1.11	0.18	0.00	0.00	0.44	0.07
28	1.05	0.17	0.00	0.00	0.27	0.04
29	0.92	0.14	0.00	0.00	0.21	0.03
30	0.93	0.14	0.00	0.00	0.42	0.06

TABLE 28

OXYGENATE WEIGHT % OF AQUEOUS PHASE

RUN # : 7075-12-B1

SAMPLE #: 59

CARBON #	ALCOHOL	ALDEHYDE	KETONE	ACID
1	0.5812	0.0000	0.0000	0.0000
2	4.4234	0.0284	0.0000	2.8711
3	2.4349	0.0000	0.1228	0.0000
4	1.7745	0.0000	0.0825	0.0000
5	0.8487	0.0000	0.0446	0.0000
6	3.2788	0.0000	0.0000	0.0000

TABLE 29

IDENTIFICATION

Run # : 7075-12-81	Catalyst: Baseline Fe ₂ O ₃ /2%Al ₂ O ₃ / 0.5%K ₂ O/1%CaO	Time on Stream: 549.7 h
Sample #: 62	Loading: 464 mL 14.7 wt% slurry	Reactor #2 : 1000 mL slurry reactor

PROCESS DATA

Inlet CO/H ₂ Ratio : 2.757	GHSV h ⁻¹ : 155.7 m ³ /kg cat/h: 0.984
Inlet CO rate mol/min: 3.95 x 10 ⁻²	P psig : 460
Inlet H ₂ rate mol/min: 1.43 x 10 ⁻²	T °C : 251.5
Impeller stir speed min ⁻¹ : 1600	Activity mol syngas/kg cat/h: 3.94

PRODUCT DISTRIBUTION, % MOL

C ₁ : 6.76	C ₁₈₊ : 1.32
C ₂ -C ₄ : 7.49	CO ₂ : 65.35
C ₅ -C ₁₁ : 3.16	H ₂ O : 12.55
C ₁₂ -C ₁₇ : 1.13	Oxygenates: 0.49

MOL % CONVERSION

Product Reactant	C ₁	C ₂ -C ₄	C ₅ -C ₁₁	C ₁₂ -C ₁₇	C ₁₈₊	CO ₂	H ₂ O	Oxygen- ates	Sum Comp. Conv.	Obs. Tot. Conv.
CO	0.29	0.97	0.82	0.69	1.29	2.80	-	0.21	7.08	6.47
H ₂	1.60	2.78	2.41	1.98	3.72	-	1.48	0.82	14.79	15.87

TABLE 30

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-31

SAMPLE #: 62

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
1	7.94	34.03	0.00	0.00	0.00	0.00
2	0.00	0.00	4.81	11.80	0.00	0.00
3	1.54	2.40	6.52	10.65	0.00	0.00
4	0.83	0.98	9.15	11.21	0.59	0.69
5	2.30	2.19	8.48	8.31	0.00	0.00
6	0.00	0.00	0.00	0.00	1.76	1.40
7	0.20	0.14	0.82	0.58	0.46	0.31
8	0.33	0.20	0.66	0.40	0.48	0.29
9	0.23	0.06	0.73	0.20	0.67	0.18
10	0.29	0.14	0.66	0.32	0.56	0.27
11	0.37	0.16	0.91	0.41	0.85	0.38
12	0.42	0.17	1.08	0.44	1.06	0.43
13	0.69	0.26	1.21	0.45	1.15	0.43
14	0.66	0.23	1.23	0.43	0.89	0.31
15	0.66	0.21	1.17	0.38	0.88	0.29
16	0.77	0.23	1.08	0.33	0.87	0.26
17	1.01	0.29	1.01	0.29	0.84	0.24
18	2.01	0.54	0.12	0.03	0.85	0.23
19	2.12	0.54	0.00	0.00	0.83	0.21
20	2.00	0.49	0.00	0.00	0.78	0.19
21	1.86	0.43	0.00	0.00	0.78	0.18
22	1.74	0.38	0.00	0.00	0.86	0.19

TABLE 30 (cont'd)

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-31

SAMPLE #: 62

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
23	1.70	0.36	0.00	0.00	0.97	0.21
24	1.59	0.32	0.00	0.00	0.68	0.14
25	1.65	0.32	0.00	0.00	0.65	0.13
26	1.53	0.29	0.00	0.00	0.66	0.12
27	1.55	0.28	0.00	0.00	0.71	0.13
28	1.71	0.30	0.00	0.00	0.43	0.08
29	1.40	0.24	0.00	0.00	0.00	0.00
30	1.29	0.21	0.00	0.00	0.34	0.05
31	0.14	0.02	0.00	0.00	0.00	0.00
32	0.07	0.01	0.00	0.00	0.05	0.01
33	0.04	0.01	0.00	0.00	0.03	0.00
34	0.02	0.00	0.00	0.00	0.01	0.00
35	0.01	0.00	0.00	0.00	0.00	0.00
36	0.01	0.00	0.00	0.00	0.00	0.00
37	0.01	0.00	0.00	0.00	0.00	0.00
38	0.00	0.00	0.00	0.00	0.00	0.00
39	0.00	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 31

OXYGENATE WEIGHT % OF AQUEOUS PHASE

RUN # : 7075-12-81

SAMPLE # : 62

CARBON #	ALCOHOL	ALDEHYDE	KETONE	ACID
1	0.3827	0.0000	0.0000	0.0000
2	2.4685	0.0176	0.0000	2.6333
3	1.1694	0.0000	0.0705	0.0000
4	0.7922	0.0000	0.0429	0.0000
5	0.3843	0.0000	0.0200	0.0000
6	3.1532	0.0000	0.0000	0.0000

TABLE 32

IDENTIFICATION

Run # : 7075-12-81	Baseline Catalyst: $\text{Fe}_2\text{O}_3/2\%\text{Al}_2\text{O}_3/$ $0.5\%\text{K}_2\text{O}/1\%\text{CaO}$	Time on Stream: 573.7 h
Sample #: 65	Loading : 464 mL 14.7 wt% slurry	Reactor #2 : 1000 mL slurry reactor

PROCESS DATA

Inlet CO/H_2 Ratio : 2.755	GHSV h^{-1} : 155.7 $\text{m}^3/\text{kg cat/h}$: 0.984
Inlet CO rate mol/min: 3.95×10^{-2}	P psig : 460
Inlet H_2 rate mol/min: 1.43×10^{-2}	T $^{\circ}\text{C}$: 253.3
Impeller stir speed min^{-1} : 800	Activity mol syngas/kg cat/h: 4.00

PRODUCT DISTRIBUTION, MOL %

C_1 : 7.50	C_{18+} : 1.10
$\text{C}_2\text{-C}_4$: 7.82	CO_2 : 63.81
$\text{C}_5\text{-C}_{11}$: 3.02	H_2O : 13.50
$\text{C}_{12}\text{-C}_{17}$: 0.93	Oxygenates: 0.70

MOL % CONVERSION

Product Reactant	C_1	$\text{C}_2\text{-C}_4$	$\text{C}_5\text{-C}_{11}$	$\text{C}_{12}\text{-C}_{17}$	C_{18+}	CO_2	H_2O	Oxygenates	Sum Comp. Conv.	Obs. Tot. Conv.
CO	0.38	1.19	0.95	0.67	1.29	3.24	-	0.27	7.99	6.83
H_2	2.18	3.43	2.76	1.92	3.70	-	1.89	1.03	16.83	15.27

TABLE 33

HYDROCARBON PRODUCT DISTRIBUTION.

RUN # 7075-12-31

SAMPLE #: 65

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
1	9.46	36.81	0.00	0.00	0.00	0.00
2	1.12	2.32	4.91	10.91	0.00	0.00
3	1.37	1.94	7.00	10.37	0.00	0.00
4	0.26	0.28	10.50	11.67	0.84	0.90
5	0.80	0.69	8.86	7.88	0.00	0.00
6	1.14	0.82	0.00	0.00	1.74	1.26
7	0.00	0.00	1.12	0.71	0.56	0.35
8	0.31	0.17	0.72	0.40	0.66	0.36
9	0.24	0.07	0.87	0.26	0.79	0.23
10	0.26	0.11	0.95	0.42	0.45	0.20
11	0.32	0.13	0.92	0.37	0.94	0.37
12	0.52	0.19	1.03	0.38	1.05	0.39
13	0.59	0.20	1.13	0.39	0.90	0.30
14	0.55	0.17	1.13	0.36	0.79	0.25
15	0.55	0.16	1.05	0.31	0.75	0.22
16	0.61	0.17	0.98	0.27	0.70	0.19
17	0.78	0.20	0.91	0.24	0.68	0.18
18	1.01	0.25	0.77	0.19	0.68	0.17
19	1.81	0.42	0.00	0.00	0.67	0.16
20	1.78	0.39	0.00	0.00	0.68	0.15
21	1.69	0.36	0.00	0.00	0.69	0.15
22	1.60	0.32	0.00	0.00	0.78	0.16

TABLE 33 (cont'd)

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 65

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
23	1.56	0.30	0.00	0.00	0.89	0.17
24	1.47	0.27	0.00	0.00	0.64	0.12
25	1.51	0.27	0.00	0.00	0.64	0.11
26	1.42	0.24	0.00	0.00	0.61	0.10
27	1.41	0.23	0.00	0.00	0.65	0.11
28	1.30	0.20	0.00	0.00	0.41	0.07
29	1.30	0.20	0.00	0.00	0.28	0.04
30	1.12	0.17	0.00	0.00	0.31	0.05
31	0.14	0.02	0.00	0.00	0.08	0.01
32	0.03	0.01	0.00	0.00	0.06	0.01
33	0.05	0.01	0.00	0.00	0.04	0.01
34	0.04	0.00	0.00	0.00	0.02	0.00
35	0.01	0.00	0.00	0.00	0.00	0.00
36	0.01	0.00	0.00	0.00	0.00	0.00
37	0.01	0.00	0.00	0.00	0.00	0.00
38	0.00	0.00	0.00	0.00	0.00	0.00
39	0.00	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 34

OXYGENATE WEIGHT % OF AQUEOUS PHASE

RUN # : 7075-12-B1

SAMPLE # : 65

CARBON #	ALCOHOL	ALDEHYDE	KETONE	ACID
1	0.4657	0.0000	0.0000	0.0000
2	3.4089	0.0209	0.0000	2.8822
3	1.9329	0.0000	0.0865	0.0000
4	1.2865	0.0000	0.0649	0.0000
5	0.5068	0.0000	0.0329	0.0000
6	3.5423	0.0000	0.0000	0.0000

TABLE 35

IDENTIFICATION

Run # : 7075-12-B1	Baseline Catalyst: $\text{Fe}_2\text{O}_3/2\% \text{Al}_2\text{O}_3/$ $0.5\% \text{K}_2\text{O}/1\% \text{CaO}$	Time on Stream: 597.5 h
Sample #: 68	Loading : 464 mL 14.7 wt% slurry	Reactor #2 : 1000 mL slurry reactor

PROCESS DATA

Inlet CO/H_2 Ratio : 2.900	GHSV h^{-1} : 312.1 $\text{m}^3/\text{kg cat/h}$: 1.973
Inlet CO rate mol/min: 8.02×10^{-2}	P psig : 455
Inlet H_2 rate mol/min: 2.76×10^{-2}	T $^{\circ}\text{C}$: 250.9
Impeller stir speed min^{-1} : 800	Activity mol syngas/kg cat/h: 5.46

PRODUCT DISTRIBUTION, MOL %

C_1 : 16.46	C_{18+} : 1.44
C_2-C_4 : 7.14	CO_2 : 51.70
C_5-C_{11} : 1.86	H_2O : 19.64
$\text{C}_{12}-\text{C}_{17}$: 1.06	Oxygenates: 0.69

MOL % CONVERSION

Product Reactant	C_1	C_2-C_4	C_5-C_{11}	$\text{C}_{12}-\text{C}_{17}$	C_{18+}	CO_2	H_2O	Oxygen- ates	Sum Comp. Conv.	Obs. Tot. Conv.
CO	0.31	0.45	0.24	0.29	0.63	0.97	-	0.01	2.93	6.07
H_2	1.80	1.51	0.73	0.86	1.90	-	1.07	0.14	8.01	6.55

TABLE 36

HYDROCARBON PRODUCT DISTRIBUTION

RUN # T075-12-B1

SAMPLE #: 68

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
1	17.84	58.88	0.00	0.00	0.00	0.00
2	0.00	0.00	1.79	3.38	0.00	0.00
3	1.92	2.31	5.85	7.35	0.00	0.00
4	12.00	10.93	1.66	1.56	0.00	0.00
5	0.00	0.00	3.89	2.93	0.00	0.00
6	0.00	0.00	0.00	0.00	1.62	0.99
7	0.22	0.12	0.54	0.29	0.38	0.20
8	0.26	0.12	0.53	0.25	0.44	0.20
9	0.19	0.04	0.71	0.17	0.58	0.13
10	0.26	0.10	0.67	0.25	0.49	0.18
11	0.32	0.11	0.86	0.30	0.73	0.25
12	0.34	0.11	1.00	0.31	0.89	0.28
13	0.57	0.16	1.13	0.33	0.94	0.27
14	0.53	0.14	1.17	0.31	0.73	0.19
15	0.54	0.13	1.12	0.28	0.73	0.18
16	0.60	0.14	1.06	0.25	0.70	0.16
17	0.74	0.16	1.02	0.23	0.68	0.15
18	0.95	0.20	0.91	0.19	0.63	0.14
19	1.94	0.38	0.00	0.00	0.69	0.14
20	1.97	0.37	0.00	0.00	0.71	0.13
21	1.93	0.34	0.00	0.00	0.76	0.14
22	1.87	0.32	0.00	0.00	0.88	0.15

TABLE 36 (cont'd)

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 68

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
23	1.84	0.30	0.00	0.00	1.03	0.17
24	1.73	0.27	0.00	0.00	0.76	0.12
25	1.77	0.27	0.00	0.00	0.73	0.11
26	1.64	0.24	0.00	0.00	0.72	0.10
27	1.46	0.20	0.00	0.00	1.36	0.19
28	1.78	0.24	0.00	0.00	0.00	0.00
29	1.46	0.19	0.00	0.00	0.00	0.00
30	1.34	0.17	0.00	0.00	0.35	0.04
31	0.06	0.01	0.00	0.00	0.14	0.02
32	0.04	0.00	0.00	0.00	0.08	0.01
33	0.02	0.00	0.00	0.00	0.05	0.01
34	0.01	0.00	0.00	0.00	0.03	0.00
35	0.01	0.00	0.00	0.00	0.01	0.00
36	0.01	0.00	0.00	0.00	0.00	0.00
37	0.00	0.00	0.00	0.00	0.00	0.00
38	0.00	0.00	0.00	0.00	0.00	0.00
39	0.00	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 37

OXYGENATE WEIGHT % OF AQUEOUS PHASE

RUN # : 7075-12-B1

SAMPLE #: 68

CARBON #	ALCOHOL	ALDEHYDE	KETONE	ACID
1	0.0000	0.0000	0.0000	0.0000
2	1.6101	0.0141	0.0000	2.9973
3	0.9067	0.0000	0.0482	0.0000
4	0.8722	0.0000	0.0296	0.0000
5	0.4860	0.0000	0.0177	0.0000
6	3.8575	0.0000	0.0000	0.0000

TABLE 38

IDENTIFICATION

Run # : 7075-12-B1	Baseline Catalyst: $\text{Fe}_2\text{O}_3/2\%\text{Al}_2\text{O}_3/$ $0.5\%\text{K}_2\text{O}/1\%\text{CaO}$	Time on Stream: 621.5 h
Sample #: 71	Loading : 464 mL 14.7 wt% slurry	Reactor #2 : 1000 mL slurry reactor

PROCESS DATA

Inlet CO/H_2 Ratio : 2.831	GHSV h^{-1} : 183.4 $\text{m}^3/\text{kg cat/h}$: 1.160
Inlet CO rate mol/min: 4.68×10^{-3}	P psig : 450
Inlet H_2 rate mol/min: 1.65×10^{-2}	T $^{\circ}\text{C}$: 281.3
Impeller stir speed min^{-1} : 800	Activity mol syngas/kg cat/h: 14.34

PRODUCT DISTRIBUTION, MOL %

C_1 : 3.31	C_{18+} : 1.16
C_2-C_4 : 6.59	CO_2 : 77.49
C_5-C_{11} : 2.94	H_2O : 4.71
$\text{C}_{12}-\text{C}_{17}$: 0.78	Oxygenates: 0.50

MOL % CONVERSION

Product Reactant	C_1	C_2-C_4	C_5-C_{11}	$\text{C}_{12}-\text{C}_{17}$	C_{18+}	CO_2	H_2O	Oxygenates	Sum Comp. Conv.	Obs. Tot. Conv.
CO	0.51	2.88	2.70	1.76	4.13	11.87	-	0.96	24.81	23.62
H_2	2.87	8.56	8.11	5.20	12.17	-	2.04	3.98	42.94	39.26

TABLE 39

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-31

SAMPLE #: 71

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
1	4.69	22.38	0.00	0.00	0.00	0.00
2	1.08	2.75	5.16	14.05	0.00	0.00
3	0.90	1.56	8.87	16.11	0.00	0.00
4	1.53	2.02	5.91	8.05	0.07	0.09
5	0.35	0.37	10.20	11.12	0.29	0.31
6	0.00	0.00	0.00	0.00	3.27	2.90
7	0.00	0.00	0.00	0.00	2.70	2.06
8	0.65	0.44	1.08	0.73	0.63	0.42
9	0.35	0.05	1.26	0.18	0.55	0.08
10	0.21	0.11	0.64	0.35	0.16	0.09
11	0.27	0.13	0.70	0.35	0.44	0.21
12	0.38	0.17	0.80	0.36	0.54	0.24
13	0.33	0.14	0.88	0.37	0.54	0.22
14	0.48	0.19	0.91	0.36	0.66	0.25
15	0.67	0.24	0.92	0.33	0.67	0.24
16	1.09	0.37	0.95	0.32	0.95	0.32
17	1.48	0.47	0.93	0.30	1.20	0.38
18	1.29	0.39	0.78	0.23	0.85	0.26
19	1.92	0.55	0.00	0.00	0.73	0.21
20	1.84	0.50	0.00	0.00	0.67	0.18
21	1.79	0.46	0.00	0.00	0.67	0.17
22	1.79	0.44	0.00	0.00	0.80	0.20

TABLE 39 (cont'd)

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-31

SAMPLE #: 71

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
23	1.86	0.44	0.00	0.00	1.00	0.24
24	1.83	0.41	0.00	0.00	0.54	0.12
25	2.07	0.45	0.00	0.00	0.53	0.11
26	1.98	0.41	0.00	0.00	0.52	0.11
27	2.11	0.42	0.00	0.00	0.69	0.14
28	2.29	0.44	0.00	0.00	0.33	0.06
29	1.98	0.37	0.00	0.00	0.00	0.00
30	1.82	0.33	0.00	0.00	0.81	0.15
31	0.05	0.01	0.00	0.00	0.04	0.01
32	0.02	0.00	0.00	0.00	0.02	0.00
33	0.01	0.00	0.00	0.00	0.01	0.00
34	0.01	0.00	0.00	0.00	0.00	0.00
35	0.01	0.00	0.00	0.00	0.00	0.00
36	0.00	0.00	0.00	0.00	0.00	0.00
37	0.00	0.00	0.00	0.00	0.00	0.00
38	0.00	0.00	0.00	0.00	0.00	0.00
39	0.00	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 40

OXYGENATE WEIGHT % OF AQUEOUS PHASE

RUN # : 7075-12-B1

SAMPLE #: 71

CARBON #	ALCOHOL	ALDEHYDE	KETONE	ACID
1	0.6422	0.0000	0.0000	0.0000
2	9.1165	0.0384	0.0000	4.8963
3	3.7767	0.0000	0.2139	0.0000
4	1.7795	0.0000	0.1262	0.0000
5	0.6429	0.0000	0.0678	0.0000
6	2.1076	0.0000	0.0000	0.0000

TABLE 41

IDENTIFICATION

Run # : 7075-12-81	Baseline Catalyst: $\text{Fe}_2\text{O}_3/2\%\text{Al}_2\text{O}_3/$ $0.5\%\text{K}_2\text{O}/1\%\text{CaO}$	Time on Stream: 645.7 h
Sample #: 74	Loading : 464 mL 14.7 wt% slurry	Reactor #2 : 1000 mL slurry reactor

PROCESS DATA

Inlet CO/H_2 Ratio : 2.810	GHSV h^{-1} : 155.0 $\text{m}^3/\text{kg cat/h}$: 0.980
Inlet CO rate mol/min: 3.95×10^{-2}	P psig : 450
Inlet H_2 rate mol/min: 1.41×10^{-2}	T $^{\circ}\text{C}$: 281.4
Impeller stir speed min^{-1} : 1600	Activity mol syngas/kg cat/h: 12.45

PRODUCT DISTRIBUTION, MOL %

C_1 : 3.33	C_{18+} : 0.73
C_2-C_4 : 6.25	CO_2 : 76.61
C_5-C_{11} : 3.25	H_2O : 6.40
$\text{C}_{12}-\text{C}_{17}$: 0.64	Oxygenates: 0.35

MOL % CONVERSION

Product Reactant	C_1	C_2-C_4	C_5-C_{11}	$\text{C}_{12}-\text{C}_{17}$	C_{18+}	CO_2	H_2O	Oxygen- ates	Sum Comp. Conv.	Obs. Tot. Conv.
CO	0.58	3.12	3.67	1.59	3.07	13.40	-	1.00	26.43	23.68
H_2	3.27	9.22	11.15	4.66	8.97	-	3.15	4.15	44.55	41.86

TABLE 42

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 74

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
1	5.30	23.43	0.00	0.00	0.00	0.00
2	1.07	2.53	5.49	13.87	0.00	0.00
3	1.64	2.64	8.83	14.87	0.00	0.00
4	0.97	1.19	6.93	8.76	0.11	0.13
5	0.42	0.41	8.44	8.53	0.30	0.30
6	0.00	0.00	0.00	0.00	6.05	4.98
7	0.00	0.00	0.00	0.00	4.77	3.37
8	0.68	0.42	1.78	1.12	1.77	1.10
9	0.47	0.08	1.74	0.32	1.83	0.33
10	0.27	0.13	0.82	0.41	0.73	0.36
11	0.32	0.15	1.02	0.47	0.91	0.41
12	0.35	0.15	1.04	0.44	0.95	0.39
13	0.53	0.21	1.01	0.39	0.88	0.34
14	0.49	0.17	0.93	0.33	0.59	0.21
15	0.52	0.17	0.84	0.28	0.57	0.19
16	0.66	0.21	0.78	0.25	0.56	0.18
17	0.78	0.23	0.73	0.22	0.56	0.16
18	0.71	0.20	0.62	0.17	0.44	0.12
19	1.21	0.32	0.00	0.00	0.33	0.09
20	1.16	0.29	0.00	0.00	0.28	0.07
21	1.16	0.28	0.00	0.00	0.30	0.07
22	1.26	0.29	0.00	0.00	0.40	0.09

TABLE 42 (cont'd)
HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 74

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
23	1.39	0.30	0.00	0.00	0.64	0.14
24	1.45	0.30	0.00	0.00	0.13	0.03
25	1.83	0.37	0.00	0.00	0.13	0.03
26	1.79	0.35	0.00	0.00	0.13	0.02
27	2.04	0.38	0.00	0.00	0.39	0.07
28	2.10	0.38	0.00	0.00	0.02	0.00
29	1.93	0.34	0.00	0.00	0.01	0.00
30	2.02	0.34	0.00	0.00	0.70	0.12
31	0.00	0.00	0.00	0.00	0.00	0.00
32	0.00	0.00	0.00	0.00	0.00	0.00
33	0.00	0.00	0.00	0.00	0.00	0.00
34	0.00	0.00	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00	0.00	0.00
36	0.00	0.00	0.00	0.00	0.00	0.00
37	0.00	0.00	0.00	0.00	0.00	0.00
38	0.00	0.00	0.00	0.00	0.00	0.00
39	0.00	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 43

OXYGENATE WEIGHT % OF AQUEOUS PHASE

RUN # : 7075-12-B1

SAMPLE #: 74

CARBON #	ALCOHOL	ALDEHYDE	KETONE	ACID
1	0.4150	0.0000	0.0000	0.0000
2	5.8462	0.0275	0.0000	2.2392
3	2.0396	0.0000	0.1271	0.0000
4	0.7834	0.0000	0.0000	0.0000
5	0.3470	0.0000	0.0350	0.0000
6	1.9431	0.0000	0.0000	0.0000

TABLE 44

IDENTIFICATION

Run # : 7075-12-81	Baseline Catalyst: $\text{Fe}_2\text{O}_3/2\%\text{Al}_2\text{O}_3/$ $0.5\%\text{K}_2\text{O}/1\%\text{CaO}$	Time on Stream: 717.6 h
Sample #: 82	Loading : 464 mL 14.7 wt% slurry	Reactor #2 : 1000 mL slurry reactor

PROCESS DATA

Inlet CO/H_2 Ratio : 1.446	GHSV h^{-1} : 148.0 $\text{m}^3/\text{kg cat/h}$: 0.935
Inlet CO rate mol/min: 3.02×10^{-2}	P psig : 440
Inlet H_2 rate mol/min: 2.09×10^{-2}	T °C : 280.7
Impeller stir speed min^{-1} : 1600	Activity mol syngas/kg cat/h: 5.81

PRODUCT DISTRIBUTION, MOL %

C_1 : 5.57	C_{18+} : 1.68
C_2-C_4 : 9.34	CO_2 : 72.87
C_5-C_{11} : 2.08	H_2O : 4.47
$\text{C}_{12}-\text{C}_{17}$: 0.43	Oxygenates: 0.02

MOL % CONVERSION

Product Reactant	C_1	C_2-C_4	C_5-C_{11}	$\text{C}_{12}-\text{C}_{17}$	C_{18+}	CO_2	H_2O	Oxygen- ates	Sum Comp. Conv.	Obs. Tot. Conv.
CO	0.46	2.17	1.03	0.52	3.42	6.02	-	0.59	14.21	13.61
H_2	1.33	3.36	1.61	0.79	5.14	-	0.53	1.28	14.03	14.36

TABLE 45

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-B1

SAMPLE #: 82

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
1	6.74	29.15	0.00	0.00	0.00	0.00
2	2.27	5.23	5.89	14.55	0.00	0.00
3	1.77	2.79	9.64	15.88	0.00	0.00
4	1.31	1.56	7.04	8.70	0.17	0.21
5	1.57	1.51	4.88	4.82	0.00	0.00
6	0.00	0.00	0.00	0.00	2.10	1.69
7	0.00	0.00	0.34	0.24	1.45	1.00
8	0.18	0.11	0.38	0.23	0.90	0.54
9	0.13	0.02	0.52	0.07	0.68	0.10
10	0.09	0.04	0.27	0.13	0.18	0.09
11	0.12	0.05	0.30	0.13	0.28	0.12
12	0.19	0.08	0.34	0.14	0.29	0.12
13	0.22	0.08	0.39	0.15	0.26	0.10
14	0.26	0.09	0.44	0.16	0.26	0.09
15	0.32	0.10	0.48	0.16	0.29	0.09
16	0.51	0.16	0.55	0.17	0.29	0.09
17	0.74	0.21	0.67	0.20	0.27	0.08
18	0.85	0.23	0.67	0.18	0.33	0.09
19	1.59	0.41	0.00	0.00	0.35	0.09
20	1.67	0.41	0.00	0.00	0.40	0.10
21	1.80	0.42	0.00	0.00	0.51	0.12
22	2.04	0.45	0.00	0.00	0.77	0.17

TABLE 45 (cont'd)

HYDROCARBON PRODUCT DISTRIBUTION

RUN # 7075-12-31

SAMPLE #: 32

CARBON #	n-alkanes		1-alkene		Branched Isomers	
	Wt %	Mole %	Wt %	Mole %	Wt %	Mole %
23	2.43	0.52	0.00	0.00	1.19	0.25
24	2.64	0.54	0.00	0.00	0.10	0.02
25	3.50	0.69	0.00	0.00	0.09	0.02
26	3.55	0.67	0.00	0.00	0.09	0.02
27	4.22	0.77	0.00	0.00	0.73	0.13
28	4.43	0.78	0.00	0.00	0.06	0.01
29	4.13	0.70	0.00	0.00	0.04	0.01
30	4.27	0.70	0.00	0.00	1.49	0.25
31	0.02	0.00	0.00	0.00	0.02	0.00
32	0.01	0.00	0.00	0.00	0.01	0.00
33	0.01	0.00	0.00	0.00	0.01	0.00
34	0.01	0.00	0.00	0.00	0.01	0.00
35	0.00	0.00	0.00	0.00	0.01	0.00
36	0.00	0.00	0.00	0.00	0.00	0.00
37	0.00	0.00	0.00	0.00	0.00	0.00
38	0.00	0.00	0.00	0.00	0.00	0.00
39	0.00	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 46

OXYGENATE WEIGHT % OF AQUEOUS PHASE

RUN # : 7075-12-81

SAMPLE #: 82

CARPEON #	ALCOHOL	ALDEHYDE	KETONE	ACID
1	0.0002	0.0000	0.0000	0.0000
2	0.5732	0.0007	0.0000	0.3155
3	0.2086	0.0000	0.0054	0.0000
4	0.1357	0.0000	0.0189	0.0000
5	0.0734	0.0000	0.0060	0.0000
6	0.2735	0.0000	0.0000	0.0000

TABLE 47

GAS HOLDUP: 5" COLD FLOW SIMULATOR

SYSTEM:THREE PHASE

LIQUID-ISOPARAFFIN

SOLID- 45-53 μ M SILICA

GAS-NITROGEN

RUN	VG FT/SEC	VL FT/SEC	EG EXP.	MANOMETER METHOD			WEIGHT FRACTION
				EG23 EXP.	EG34 EXP.	EG45 EXP.	
6962-48-1	0.344	0.060	0.201	0.218	0.195	0.195	0.100
6962-49-1	0.061	0.0	0.077	0.055	0.080	0.075	0.100
6984-44-1	0.500	0.060	0.231	0.194	0.240	0.217	0.100
6984-45-1	0.500	0.0	0.226	0.200	0.258	0.247	0.100
6984-46-1	0.200	0.060	0.171	0.143	0.188	0.168	0.100
6984-47-1	0.100	0.0	0.082	0.084	0.084	0.113	0.100
6962-50-1	0.077	0.060	0.078	0.070	0.085	0.084	0.100
6962-51-1	0.207	0.0	0.144	0.081	0.156	0.133	0.100
6962-52-1	0.517	0.050	0.237	0.203	0.228	0.213	0.200
6962-53-1	0.346	0.0	0.194	0.147	0.173	0.187	0.200
6962-54-1	0.368	0.050	0.202	0.150	0.177	0.188	0.200
6962-55-1	0.113	0.0	0.108	0.072	0.065	0.089	0.200

TABLE 47 (cont'd)

GAS HOLDUP: 5" COLD FLOW SIMULATOR

SYSTEM: THREE PHASE

LIQUID-ISOPARAFFIN

SOLID- 45-53 μ M SILICA

GAS-NITROGEN

RUN	VG FT/SEC	VL FT/SEC	EG EXP.	MANOMETER METHOD			WEIGHT FRACTION
				EG23 EXP.	EG34 EXP.	EG45 EXP.	
6962-56-1	0.202	0.050	0.165	0.161	0.161	0.161	0.200
6984-48-1	0.200	0.0	0.130	0.063	0.115	0.130	0.200
6984-49-1	0.060	0.050	0.046	0.043	0.058	0.053	0.200
6984-50-1	0.060	0.0	0.067	0.037	0.051	0.064	0.200
6984-51-1	0.060	0.0	0.052	0.000	0.040	0.055	0.300
6962-57-1	0.072	0.050	0.082	0.063	0.078	0.088	0.300
6962-58-1	0.209	0.0	0.140	0.085	0.104	0.128	0.300
6962-59-1	0.205	0.050	0.142	0.147	0.147	0.140	0.300
6962-60-1	0.510	0.0	0.223	0.190	0.221	0.228	0.300
6962-61-1	0.118	0.050	0.125	0.124	0.116	0.123	0.300
6962-62-1	0.125	0.0	0.104	0.047	0.127	0.090	0.300
6962-63-1	0.506	0.050	0.226	0.195	0.203	0.205	0.300

TABLE 48

GAS HOLDUP: 5" COLD FLOW SIMULATOR

SYSTEM: TWO PHASE

LIQUID-WATER

GAS - AIR

RUN	VG FT/SEC	VL FT/SEC	EG ECP.	<u>MANOMETER METHOD</u>		
				EG23	EG34	EG24
6962-71-2	0.1	0.0	0.108	0.122	0.109	0.114
6962-71-3	0.1	0.0	0.115	0.111	0.125	0.119
6962-71-4	0.475	0.0	0.251	0.267	0.250	0.257
6962-71-5	0.475	0.0	0.250	0.289	0.217	0.248
6962-71-6	0.465	0.0	0.253	0.300	0.225	0.257

TABLE 49

GAS HOLDUP: 5" COLD FLOW SIMULATOR

SYSTEM: THREE PHASE

LIQUID- WATER

SOLID- 0-5 μ M SILICA

GAS- AIR

RUN	VG FT/SEC	VL FT/SEC	EG EXP.	MANOMETER METHOD		WEIGHT FRACTION	K _{LA} 1/SEC
				EG23 EXP	EG34 EXP		
6962-73-1	0.050	0.0	0.029	0.024	0.031	0.300	-
6962-74-1	0.100	0.0	0.059	0.067	0.029	0.300	-
6962-75-1	0.200	0.0	0.086	0.091	0.078	0.300	-
6962-76-1	0.350	0.0	0.121	0.143	0.093	0.300	0.0315
6962-77-1	0.500	0.0	0.145	0.143	0.152	0.300	0.0345
6962-78-1	0.050	0.0	0.030	0.030	0.022	0.200	0.0086
6962-79-1	0.130	0.0	0.058	0.079	0.040	0.200	0.0156
6962-80-1	0.220	0.0	0.089	0.084	0.089	0.200	0.0240
6962-81-1	0.350	0.0	0.122	0.116	0.121	0.200	0.0305
6962-82-1	0.500	0.0	0.142	0.181	0.168	0.200	0.0359
6962-83-1	0.050	0.0	0.044	0.041	0.038	0.100	0.0125
6962-84-1	0.100	0.0	0.076	0.077	0.080	0.100	0.0228

TABLE 49 (cont'd)

GAS HOLDUP: 5" COLD FLOW SIMULATOR

SYSTEM:THREE PHASE

LIQUID- WATER

SOLID- 0-5 μ M SILICA

GAS- AIR

RUN	VG FT/SEC	VL FT/SEC	EG EXP.	MANOMETER METHOD		WEIGHT FRACTION	K _L A 1/SEC
				EG23 EXP	EG34 EXP		
6962-85-1	0.200	0.0	0.089	0.100	0.106	0.100	0.0290
6962-86-1	0.350	0.0	0.132	0.121	0.148	0.100	0.0373
6962-87-1	0.500	0.0	0.161	0.194	0.194	0.100	0.0438

Table 50
GAS HOLDUP: 5" COLD FLOW SIMULATOR

SYSTEM: THREE PHASE

LIQUID- WATER

SOLID- 90-115 μ M SILICA

GAS- AIR

RUN	VG FT/SEC	VL FT/SEC	EG EXP.	EG23 EXP	EG34 EXP	WEIGHT FRACTION	$K_L a$ 1/SEC
6962-88-1	0.100	0.0	0.055	0.017	0.020	0.300	0.0206
6962-89-1	0.200	0.0	0.104	0.025	0.074	0.300	--
6962-90-1	0.300	0.0	0.130	0.079	0.092	0.300	0.0357
6962-91-1	0.400	0.0	0.172	0.176	0.151	0.300	0.0578
6962-92-1	0.500	0.0	0.188	0.163	0.161	0.300	0.0640
6962-93-1	0.100	0.0	0.064	0.026	0.034	0.200	0.0230
6962-94-1	0.200	0.0	0.118	0.070	0.083	0.200	0.0402
6962-95-1	0.350	0.0	0.175	0.132	0.154	0.200	0.0629
6962-96-1	0.280	0.0	0.153	0.115	0.141	0.200	0.0498
6962-97-1	0.500	0.0	0.200	0.170	0.197	0.200	0.0684
6962-98-1	0.100	0.0	0.078	0.053	0.051	0.100	0.0333
6962-99-1	0.200	0.0	0.120	0.065	0.107	0.100	0.0477
6962-100-1	0.300	0.0	0.216	0.212	0.212	0.100	0.0679
6962-101-1	0.400	0.0	0.210	0.203	0.217	0.100	0.0726
6962-102-1	0.500	0.0	0.222	0.237	0.237	0.100	0.0713