Table 1

Gas Phase Tests

Catalyst	Batch #	Composition (wt%)		Gas Phase Run #	Pressure (Psig)	Temp. (°C)	GHSV (h^{-1})	CO/H_2	Usage ($\Delta CO/\Delta H_2$)	X_{CO+H_2}	X_{CO}	X_{H_2}	Bulk Activity, mol syngas/ kg cat/hr	Specific Activity, mol/CO mol metal/min
					300	220	1000	1.0	0.34	10	5	15	12.9	0.07
$Co/Ti/SiO_2$	8466-27	Co	Ti	8413-51-27	300	240	1000	1.0	0.48	26	16	36	33.1	0.24
		4.4	4.0		300	260	1060	1.1	0.52	46	31	60	59.2	0.45
					300	220	1010	1.0	0.38	12	6	17	7.4	0.06
Co/Zr/	8466-25	Co	Zr	8413-45-25	300	240	1010	1.0	0.54	38	27	51	24.5	0.23
$MgO \cdot 3.6SiO_2$		3.7	7.2		300	260	1010	1.1	0.57	57	40	74	36.1	0.35
					300	220	1000	1.1	0.73	11	9	13	14.7	0.14
$Co/Zr/SiO_2$	8466-28	Co	Zr	8413-58-28	300	240	1000	1.0	0.33	25	13	38	32.9	0.18
		4.6	7.5		300	260	1000	1.1	0.46	48	29	68	62.4	0.43
					300	240	1000	1.1	0.47	24	14	34	31.1	0.22
$Ru/Zr/SiO_2$	8466-37	Ru	Zr	8413-73-37	300	220	1050	1.0	0.45	26	16	35	35	0.46
		4.0	3.3		300	240	1050	1.0	0.39	49	28	70	70.7	0.83
					300	260	1060	1.0	0.46	56	35	77	81.1	1.05
					300	220	1000	1.1	0.46	18	11	25	19.5	0.17
Co/TiO_2	8466-38	Co		8413-82-38	300	240	1000	1.0	0.51	30	20	42	32.4	0.31
		3.5			300	260	1060	1.0	0.43	39	24	55	44.6	0.38

Table I (Cont'd)

Gas Phase Tests

Catalyst	Batch #	Gas Phase Run #	Selectivity, Wt% C_{1-}	C_{2-4-}	C_{5-11-}	C_{12-18-}	C_{19-23-}	C_{24+}	C_{5-23-}
			16	39	40	4	0.9	0.1	44.5
Ti/SiO_2	8466-27	8413-61-27	18	30	40	10	3	0.2	52
			12	16	46	20	6	0.7	71
			17	41	36	5	1	0.2	42
Co/Zr/	8466-25	8413-45-25	16	31	45	6	1	0.1	52
$MgO \cdot 3.6SiO_2$			19	23	43	13	2	0.2	58
			22	17	46	13	1	0.2	60
$Co/Zr/SiO_2$	8466-28	8413-58-28	22	17	46	13	2	0.1	61
			9	8	20	24	13	27	57
			8	7	17	24	20	23	61
			No mass balance at 220°						
$Ru/Zr/SiO_2$	8466-37	8413-73-37	2	4	13	28	10	36	59
			5	6	18	31	15	24	64
			12	16	22	15	13	23	50
Co/TiO_2	8466-38	8413-82-38	8	7	18	27	22	19	67
			11	8	19	23	18	22	60

Table 2

Gas Phase

Batch No:	$Co/Ti/SiO_2$(8466-27)			$Co/Zr/SiO_2$(8466-18)		
% Co:	4.4			3.5		
% promoter:	4.0			6.6		
Activation:	hydrogen			hydrogen		
Run Conditions,						
Pressure:	300 psig			300 psig		
Temp, ^oC:	220	240	260	220	240	260
GHSV, hr^{-1}:	1002	1002	1002	1000	1000	1000
Feed(CO/H_2):	1.03	1.05	1.09	0.94	0.94	0.94
Usage(CO/H_2):	0.34	0.48	0.52	0.55	0.50	0.43
Bulk Activity: (mol syngas/Kg cat/hr)	13	33	59	31	55	74
Specific Activity: (mol CO/mol Co/min)	0.072	0.24	0.45	0.31	0.51	0.62
X_{CO+H_2} (%)	10	26	46	28	49	65
X_{CO}	5	16	30	20	33	40
X_{H_2}	15	36	64	35	63	88
Wt.% Selectivity:						
C_1	16	18	12	10	10	15
C_{2-4}	39	30	16	23	15	16
C_{5-11}	40	40	45	49	39	30
C_{12-18}	4	10	20	16	25	21
C_{19-23}	0.5	2	6	2	8	7
C_{24+}	0.1	0.2	1	0.2	3	12
C_{5-23}	44	52	71	67	72	58

TABLE 3

Gas Phase

Batch No:	Co(ex-nitrate)/Zr/SiO_2(8466-28)			$Co/Zr/SiO_2$(8466-18)		
% Co:	4.6			3.5		
% promoter:	7.5			6.6		
Activation:	hydrogen			hydrogen		
Run Conditions,						
Pressure:	300 psig			300 psig		
Temp, °C:	220	240	260	220	240	260
GHSV, hr^{-1}:	1000	1000	1000	1000	1000	1000
Feed(CO/H_2):	1.1	1.1	1.1	0.94	0.94	0.94
Usage(CO/H_2):	0.73	0.47	0.46	0.55	0.50	0.43
Bulk Activity: (mol syngas/Kg cat/hr)	15	31	62	31	55	74
Specific Activity: (mol CO/mol Co/min)	0.14	0.22	0.43	0.31	0.51	0.62
X_{CO+H_2} (%)	11	24	48	28	49	65
X_{CO}	9	15	29	20	33	40
X_{H_2}	13	34	68	35	63	88
Wt.% Selectivity:						
C_1	22	8	9	10	10	15
C_{2-4}	17	7	8	23	15	16
C_{5-11}	46	16	20	49	39	30
C_{12-18}	13	24	24	16	25	21
C_{19-23}	0.6	20	13	2	8	7
C_{24+}	0.2	23	27	0.2	3	12
C_{5-23}	60	60	57	67	72	58

TABLE 4

CATALYST PROPERTIES

Catalyst	B.E.T. Surface Area	Total H_2 Uptake	Active Metal Surface Area	% Dispersion
4% Co/Prom/Al_2O_3	209 m^2/g	5.0 μmol/g at 35°C	0.4 m^2/g	1.2
10.8% Co/Prom/Al_2O_3	N.A.	101.2 at 100°C	5.4	9.7
3.5% Co/Prom/SiO_2	316	39.8 at 100°C	3.0	10
3% Co/SiO_2 [1]	N.A.	20	N.A.	11
3% Co/Al_2O_3 [1]	N.A.	5.6	N.A.	10
22% Co/0.5% Ru/Th/Al_2O_3 [2]	150-225	150-200	N.A.	8

[1] C. H. Bartholomew (1985) [2] U.S. Patent 4,413,064 to Gulf (11/1/83).

TABLE 5

COMPARATIVE CATALYST TEST DATA

Catalyst Run No.	Composition, Wt		P, psig	T, °C	SV, L/g/hr	Feed CO/H_2	Usage CO/H_2	Conv. H_2+CO	% Conv. H_2	% Conv. CO	Bulk Activity mol syngas/ kg cat/hr	Specific Activity mol CO/ mol metal/min	Hydrocarbon Selectivity, Wt C_1	C_2-C_4	C_5-C_{11}	C_{12}-C_{18}	C_{19}-C_{23}	C_{24}+	Purity C_{5-23}
[1]$Co_2(CO)_8$/ $Zr(OPr)_4$[b]/Al_2O_3	Co 3.01	Zr 6.04	309	220.9	1.65	1.05	0.57	17.8	23.2	12.6	13.1	0.12	13.6	24.9	33.2	14.3	7.6	6.4	55.1
			305	250.8	1.64	1.57	0.67	25.3	38.9	16.6	18.5	0.19	11.5	10.4	29.2	15.3	12.5	21.1	57.0
7595-60-648.4			305	281.0	1.64	1.57	0.59	31.7	51.2	19.4	23.2	0.22	20.6	20.2	30.4	12.1	3.9	4.8	46.4
[1]$Ru_3(CO)_{12}$/ $Zr(OPr)_4$/Al_2O_3	Ru 2.75	Zr 4.93	316	241.1	2.04	1.87	0.95	7.5	10.6	5.7	6.8	0.20	9.7	11.5	12.2	20.5	18.5	27.6	51.2
			607	281.6	2.04	1.77	0.67	25.4	45.4	14.2	23.2	0.51	14.6	13.6	37.1	20.1	9.3	5.3	66.5
7887-36-470			600	276.7	0.97	1.33	0.51	39.9	61.6	23.6	17.3	0.36	9.3	10.2	36.7	27.5	8.7	7.6	72.9
[1]$Co_2(CO)_8/Al_2O_3$	Co 4.71		300	239.4	2.06	1.50	0.67	16.7	25.1	11.1	15.4	0.13	9.6	11.5	23.7	22.7	15.3	17.2	61.7
7887-67-445			300	240.9	1.07	1.84	0.79	21.6	34.3	14.7	10.3	0.09	7.6	9.8	24.9	22.1	14.9	20.7	61.9
			300	238.7	2.07	2.00	0.88	14.7	23.4	10.3	13.6	0.13	7.9	9.4	20.6	25.0	18.4	18.7	64.0
[1]$FeCo_3(CO)_{12}$/ Al_2O_3	Fe 0.85	Co 2.60	315	242.6	1.86	1.02	0.42	20.2	28.7	11.9	16.8	0.14	10.1	11.0	26.0	20.4	16.7	15.8	63.1
8385-22-677			320	261.1	1.09	2.14	0.40	17.5	39.0	7.4	8.5	0.07	13.8	15.7	33.5	21.2	10.0	5.8	64.7
			300	281.0	1.92	2.02	0.60	24.5	46.2	13.8	21.0	0.22	16.9	15.8	35.6	19.3	7.9	4.5	62.8
$Co_2(CO)_8$/ $Ti(OPr)_4$/Al_2O_3	Co 3.49	Ti 0.65	300	239	0.90	2.02	0.60	24.0	46.0	13.1	9.6	0.10	7.1	12.3	30.4	22.8	12.6	14.8	65.8
			600	258	1.07	1.57	0.46	26.2	42.5	14.4	21.9	0.20	15.4	15.5	34.3	18.8	7.9	8.1	61.0
7888-1-509			310	282	1.82	1.51	0.56	20.7	34.3	11.7	16.8	0.16	24.8	15.6	30.3	16.9	9.3	3.1	56.5
[1]$Co_2(CO)_8$/ $Zr(OPr)_4$/Al_2O_3	Co 5.07	Zr 4.39	300	239	0.86	1.95	0.41	19.4	40.7	8.5	7.5	0.04	8.0	11.3	32.9	22.5	12.2	13.1	67.6
			305	262	0.86	1.95	0.51	32.3	63.0	16.5	12.4	0.08	7.7	9.6	29.2	24.1	12.9	16.5	66.2
7888-33-731			300	269	1.73	0.98	0.41	35.8	50.3	21.0	27.6	0.16	14.1	12.0	34.4	19.8	9.2	10.5	63.4
[1]$FeCo_3(CO)_{12}$/ K/Al_2O_3	Fe 0.78	Co 2.44	K 0.02	320	240	1.6	2.01	0.64	11.9	21.9	6.9	8.4	0.10	9.8	11.7	31.0	22.1	14.6	10.8	67.7
				320	260	1.6	2.03	0.68	20.6	37.2	12.6	14.5	0.18	10.0	11.6	34.1	24.9	12.3	7.1	71.3
8385-60-707				298	282	1.5	1.01	0.50	41.0	65.0	27.3	27.3	0.27	19.1	15.7	35.4	17.4	7.5	4.9	60.3
[2]$Co_2(CO)_8$/ $Zr(OPr)_4$/Al_2O_3	Co 5.07	Zr 7.82	302	241	2.0	0.99	0.51	42.5	56.0	29.0	35.3	0.29	7.9	13.7	37.0	21.4	8.9	9.1	69.3
			307	258	2.0	1.48	0.53	34.5	56.0	19.9	28.7	0.24	7.2	10.8	34.1	27.9	8.6	11.4	70.6
8523-1-4			302	260	1.0	1.87	0.58	37.6	68.3	21.2	15.8	0.14	4.9	7.1	20.2	26.2	17.2	18.4	69.6

[1]Synthesis Gas Activation

[2]H_2 Activation

TABLE 5 (CONTINUED)

COMPARATIVE CATALYST-TEST DATA

H_2 ACTIVATED CATALYSTS

Catalyst/ Run No.	Composition, wt Co	Zr	P, psig	T, °C	SV, L/g/hr	Feed CO/H_2	Usage CO/H_2	% Conv. H_2+CO	% Conv. H_2	% Conv. CO	Bulk Activity mol syngas/ kg cat/hr	Specific Activity mol CO/ mol metal/min	Hydrocarbon Selectivity, Wt. % C_1	C_2-C_4	C_5-C_{11}	C_{12}-C_{18}	C_{19}-C_{23}	C_{24}^+	Fuels C_5-C_{23}
$Co(NO_3)_2/Zr(OPr)_4/Al_2O_3$	4.25	7.10	310	241	1.0	2.00	0.54	20.8	40.6	10.9	11.4	0.09	5.2	4.2	11.2	16.9	23.7	38.8	51.8
/8888-85-2			310	2 0	2.0	1.58	0.60	24.8	39.9	15.3	27.7	0.24	12.0	9.1	22.7	25.8	14.1	16.3	67.6
			310	281	2.0	1.60	0.50	33.4	57.2	18.2	37.2	0.30	14.9	11.2	23.7	18.9	13.4	17.9	56.0
	Co	Zr																	
$Co_2(CO)_8/Zr(OPr)_4/Al_2O_3$	10.8	8.5	303	239	2.0	1.00	0.43	32.7	45.7	19.7	30.7	0.07	7.7	15.0	22.0	22.6	13.9	18.8	58.5
			310	239	2.0	2.00	0.44	14.5	30.3	6.7	13.5	0.03	8.3	13.8	22.2	21.0	15.7	19.0	58.9
8523-41-9			310	260	1.0	1.00	0.60	45.9	61.3	30.4	21.5	0.06	15.0	14.0	27.4	20.0	9.8	13.8	57.2
	Co	Zr																	
$Co_2(CO)_8/Zr(OPr)_4/SiO_2$	4.9	9.3	310	240	2.0	1.00	0.47	40.8	55.5	26.2	36.5	0.23	8.1	14.5	37.4	24.9	8.2	6.9	70.5
			310	261	1.0	1.50	0.43	42.9	75.1	21.4	19.1	0.12	11.0	12.9	37.4	23.3	8.0	7.4	68.7
8670-11-18			310	282	1.0	2.00	0.59	41.4	78.0	23.1	18.5	0.14	13.5	15.4	32.1	23.9	9.6	5.5	65.6
	Co	Zr																	
$Co_2(CO)_8/Zr(OPr)_4/Al_2O_3$	5.0	7.82	302	241	2.0	0.99	0.51	42.5	56.0	29.0	35.3	0.29	7.9	13.7	37.0	23.4	8.9	9.1	69.3
			307	258	2.0	1.48	0.53	34.5	56.0	19.9	28.7	0.24	7.2	10.8	34.1	27.9	8.6	11.4	70.6
8523-1-4			302	260	1.0	1.87	0.58	37.6	68.3	21.2	15.8	0.14	4.9	7.1	26.2	26.2	17.2	18.4	69.6
$Co_2(CO)_8/Fe_3(CO)_{12}/Zr(OPr)_4/SiO_2$	Co 4.91	Fe 0.93	Zr 9.09	300	241	2.0	1.6	0.55	37.3	61.6	21.7	34.1	0.20	4.8	9.2	29.4	29.0	14.5	13.1	72.9
8670-12-23				300	261	2.0	1.0	0.30	33.9	46.4	21.4	30.3	0.16	13.1	19.8	39.7	17.1	5.5	4.8	62.3
				315	280	2.0	2.0	0.59	27.3	52.0	15.2	24.4	0.15	15.8	19.4	41.8	18.2	3.6	1.2	63.6

TABLE 5 (CONTINUED)

COMPARATIVE CATALYST TEST DATA

(H_2 ACTIVATED CATALYSTS)

Catalyst Designation	Composition, wt		P, psig	T, °C	SV, L/g/hr	Feed CO/H_2	Usage CO/H_2	Conv. H_2+CO	Conv. H_2	Conv. CO	Bulk Activity mol syngas/ kg cat/hr	Specific Activity mol CO/ mol metal/min	Hydrocarbon Selectivity, Wt C_1	C_2-C_4	C_5-C_{11}	C_{12}-C_{18}	C_{19}-C_{23}	C_{24}	C_5-23
$Co_2(CO)_8/Zr(OPr)_4$/	Co	Zr																	
$MgO \cdot 3.6SiO_2$	4.8	9.4	301	240	2.0	1.0	0.45	24.4	33.7	15.1	21.8	0.138	10.5	19.4	28.9	24.8	8.3	8.1	82.0
8670-60-25			302	261	2.0	1.5	0.52	22.8	37.6	13.0	20.4	0.143	19.1	27.2	34.5	12.0	4.2	3.0	90.7
			300	260	2.0	2.0	0.52	18.0	35.8	9.2	16.0	0.112	17.8	27.4	33.9	14.3	4.9	1.7	53.1
$Co_2(CO)_8/Ti(OPr)_4$/	Co	Ti																	
SiO_2	5.2	4.8	298	240	2.0	1.0	0.32	20.0	30.2	9.8	17.9	0.083	12.6	26.5	37.1	16.4	5.2	2.2	58.7
8670-57-27			300	261	2.0	1.0	0.58	33.0	41.8	24.2	29.5	0.206	15.3	13.7	29.6	21.3	10.6	9.6	61.5
			300	282	2.0	1.0	0.54	41.1	53.3	28.8	36.7	0.245	23.5	17.3	34.3	15.2	6.0	3.7	55.5
$Co_2(CO)_8/Zr(OPr)_4$/	Co	Zr																	
SiO_2 -- Extended Test - 8662-1-31	5.3	10.2	300	242	1.8	0.52	0.49	65.8	67.1	63.2	52.9	0.323	20.6	26.7	38.0	10.7	2.5	1.4	51.2

TABLE 6

SLURRY SCREENING SUMMARY

80/10-12-28

16.8 wt% (76.9g) $Co_2(CO)_8/Fe_3(CO)_{12}/Zr(OPr)_4/SiO_2$

Sample No.	Time on Stream h	P psig	T °C	SV, NL/g cat/hr	%XCO+H_2	%XCO	%XH_2	Feed CO/H_2	Usage $\Delta CO/\Delta H_2$	Bulk Activity mol syngas/kg cat/h	Specific Activity mol CO/mol Metal /min	Selectivity Wt% C_1	C_2-C_4	C_5-C_{11}	C_{12}-C_{18}	C_{19}-C_{23}	C_{24}^+	C_5-C_{23}
6	94	300	241	2.0	37.3	31.7	61.6	1.6	0.56	34.1	0.202	4.8	9.2	29.4	29.0	14.5	13.1	72.9
14	167	305	240	1.0	35.1	23.5	54.4	1.7	0.72	16.0	0.112	14.2	23.8	33.4	16.6	6.1	6.1	56.1
17	236	300	241	1.0	33.6	23.6	43.7	1.0	0.54	15.0	0.088	10.2	16.5	29.2	23.7	10.8	10.4	62.9
20	262	298	260	1.0	35.3	24.2	46.4	1.0	0.52	15.7	0.090	9.6	14.7	26.7	27.0	12.9	9.1	66.6
23	285	300	261	1.0	33.0	20.8	51.4	1.5	0.61	14.8	0.093	6.3	10.4	29.0	32.9	12.4	9.0	74.3
26	310	300	260	2.0	31.3	16.8	56.8	2.0	0.67	14.0	0.094	7.5	12.2	32.8	30.8	10.9	5.8	74.5
32	406	300	260	2.0	22.9	12.0	39.3	1.5	0.46	20.5	0.108	10.4	17.4	36.0	26.1	6.3	3.8	66.4
35	430	300	261	2.0	33.9	21.4	46.4	1.0	0.46	30.3	0.159	13.1	19.8	39.7	17.1	5.5	4.8	62.3
38	454	997	260	2.0	35.5	25.0	47.1	1.1	0.58	31.7	0.194	10.8	18.0	30.3	21.2	11.4	8.3	67.9
41	475	308	261	2.0	50.8	38.8	63.5	1.1	0.65	45.4	0.297	23.0	24.9	34.4	12.6	3.3	1.8	50.3
44	503	312	260	2.0	40.6	25.8	62.9	1.5	0.62	36.3	0.231	17.9	22.6	36.8	15.0	6.0	1.7	57.8
47	575	315	260	2.0	27.3	15.2	52.0	2.0	0.59	24.4	0.151	15.8	19.4	41.8	18.2	3.6	1.2	63.6
50	598	315	260	2.0	29.4	19.4	39.5	1.0	0.60	26.1	0.144	19.8	24.2	34.4	13.1	6.4	2.1	53.9
53	623	314	260	2.0	20.3	14.1	26.6	1.0	0.63	18.1	0.105	17.5	23.2	27.6	14.1	11.4	6.2	59.1

TABLE 7

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Fe/Zr/SiO2
SAMPLE NO: 8670+12+23+6

REACTOR LOADING, MLS :	459.0	T, C :	241.0	FEED RATIO,	
CATALYST LOADING, WT%:	16.8	P, PSIG :	300	CO/H2:	1.56
TIME ON STREAM, HRS :	94.1	SV, L/G/HR:	2.0		

USAGE RATIO, CO/H2 :	0.55	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	37.30	MOL SYNGAS/KG CAT/HR:	34.098
%CO CONV. :	21.74	SPECIFIC ACTIVITY,	
%H2 CONV. :	61.55	MOL CO/MOL METAL/MIN:	0.202

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	8.79	H2O:	10.98
OXYGENATES :	0.14	CO :	77.14
CO2 :	1.20	H2 :	1.74

HYDROCARBON SELECTIVITY, WT%:

C1 :	4.78	C4+ENE :	2.95
C2+ANE :	1.06	C5+C11 :	29.41
C2+ENE :	0.25	C12+C18:	28.97
C3+ANE :	0.66	C19+C23:	14.45
C3+ENE :	3.40	C24+34 :	11.35
C4 ISO+ANE:	1.02	C35+ :	1.70

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	29.41
DIESEL (C9+C25) :	59.19

% ELEMENTAL RECOVERY:

CARBON :	96.79
HYDROGEN:	96.23
OXYGEN :	97.24

TABLE 8

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 6

CARBON NO.	n-ALKANES WT %	n-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	4.78	29.49	0.00	0.00	0.00	0.00
2	1.06	3.50	0.25	0.88	0.00	0.00
3	0.66	1.47	3.40	7.98	0.00	0.00
4	1.02	1.73	2.95	5.20	0.00	0.00
5	1.36	1.86	3.14	4.43	0.15	0.21
6	5.15	5.91	0.23	0.28	0.00	0.00
7	2.06	2.03	1.43	1.43	0.29	0.29
8	1.91	1.66	1.24	1.09	0.49	0.42
9	2.21	1.71	1.45	1.14	0.63	0.49
10	2.07	1.44	1.31	0.92	0.50	0.35
11	2.09	1.32	0.96	0.62	0.72	0.45
12	2.24	1.30	0.82	0.48	0.56	0.33
13	2.48	1.33	0.56	0.31	0.64	0.34
14	3.17	1.58	0.00	0.00	0.74	0.37
15	3.43	1.59	0.00	0.00	0.78	0.36
16	3.76	1.64	0.00	0.00	0.79	0.35
17	4.00	1.64	0.00	0.00	0.78	0.32
18	3.64	1.42	0.00	0.00	0.59	0.23
19	3.28	1.21	0.00	0.00	0.18	0.07
20	3.00	1.05	0.00	0.00	0.16	0.06
21	2.74	0.91	0.00	0.00	0.14	0.05
22	2.48	0.79	0.00	0.00	0.13	0.04

TABLE 8 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 6

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	2.21	0.67	0.00	0.00	0.13	0.04
24	1.95	0.57	0.00	0.00	0.09	0.03
25	1.72	0.48	0.00	0.00	0.05	0.02
26	1.44	0.39	0.00	0.00	0.03	0.01
27	1.21	0.32	0.00	0.00	0.00	0.00
28	0.99	0.25	0.00	0.00	0.09	0.02
29	0.78	0.19	0.00	0.00	0.02	0.00
30	0.69	0.16	0.00	0.00	0.05	0.01
31	0.64	0.14	0.00	0.00	0.03	0.01
32	0.53	0.12	0.00	0.00	0.03	0.01
33	0.49	0.10	0.00	0.00	0.03	0.01
34	0.44	0.09	0.00	0.00	0.06	0.01
35	0.47	0.09	0.00	0.00	0.00	0.00
36	0.45	0.09	0.00	0.00	0.00	0.00
37	0.31	0.06	0.00	0.00	0.00	0.00
38	0.20	0.04	0.00	0.00	0.00	0.00
39	0.16	0.03	0.00	0.00	0.00	0.00
40	0.10	0.02	0.00	0.00	0.00	0.00

TABLE 9

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Fe/Zr/SiO2
SAMPLE No: 8670+12+23+14

REACTOR LOADING, MLS :	459.0	T, C :	240.4	FEED RATIO,	
CATALYST LOADING, WT%:	16.8	P, PSIG :	305	CO/H2:	1.67
TIME ON STREAM, HRS :	167.3	SV, L/G/HR:	1.0		

USAGE RATIO, CO/H2 :	0.72	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	35.06	MOL SYNGAS/KG CAT/HR:	16.035
%CO CONV. :	23.50	SPECIFIC ACTIVITY,	
%H2 CONV. :	54.37	MOL CO/MOL METAL/MIN:	0.112

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	4.76	H2O:	9.31
OXYGENATES :	0.15	CO :	81.16
CO2 :	2.56	H2 :	2.07

HYDROCARBON SELECTIVITY, WT%:

C1 :	14.17	C4+ENE :	6.95
C2+ANE :	3.06	C5+C11 :	33.39
C2+ENE :	0.79	C12+C18:	16.57
C3+ANE :	1.66	C19+C23:	6.05
C3+ENE :	8.85	C24+34 :	5.51
C4 ISO+ANE:	2.36	C35+ :	0.63

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	33.39
DIESEL (C9+C25) :	32.60

% ELEMENTAL RECOVERY:

CARBON :	86.93
HYDROGEN:	86.34
OXYGEN :	93.31

TABLE 10

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 14

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	14.17	46.49	0.00	0.00	0.00	0.00
2	3.06	5.35	0.79	1.48	0.00	0.00
3	1.66	1.98	8.85	11.06	0.00	0.00
4	2.26	2.04	6.95	6.52	0.10	0.09
5	2.72	1.98	6.62	4.96	0.33	0.24
6	7.37	4.50	0.27	0.17	0.00	0.00
7	2.52	1.32	1.87	1.00	0.24	0.13
8	1.73	0.79	1.12	0.52	0.32	0.15
9	1.52	0.62	0.98	0.41	0.24	0.10
10	1.56	0.58	0.97	0.36	0.41	0.15
11	1.44	0.48	0.67	0.23	0.48	0.16
12	1.52	0.47	0.56	0.18	0.43	0.13
13	1.56	0.44	0.42	0.12	0.52	0.15
14	1.91	0.50	0.00	0.00	0.53	0.14
15	1.91	0.47	0.00	0.00	0.57	0.14
16	1.99	0.46	0.00	0.00	0.56	0.13
17	1.90	0.42	0.00	0.00	0.42	0.09
18	1.51	0.31	0.00	0.00	0.26	0.05
19	1.34	0.26	0.00	0.00	0.09	0.02
20	1.23	0.23	0.00	0.00	0.08	0.01
21	1.13	0.20	0.00	0.00	0.07	0.01
22	1.04	0.18	0.00	0.00	0.07	0.01

TABLE 10 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 14

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.94	0.15	0.00	0.00	0.06	0.01
24	0.84	0.13	0.00	0.00	0.05	0.01
25	0.77	0.12	0.00	0.00	0.04	0.01
26	0.66	0.09	0.00	0.00	0.03	0.00
27	0.56	0.08	0.00	0.00	0.02	0.00
28	0.47	0.06	0.00	0.00	0.03	0.00
29	0.39	0.05	0.00	0.00	0.02	0.00
30	0.35	0.04	0.00	0.00	0.02	0.00
31	0.34	0.04	0.00	0.00	0.01	0.00
32	0.33	0.04	0.00	0.00	0.00	0.00
33	0.31	0.03	0.00	0.00	0.00	0.00
34	0.27	0.03	0.00	0.00	0.00	0.00
35	0.22	0.02	0.00	0.00	0.00	0.00
36	0.16	0.02	0.00	0.00	0.00	0.00
37	0.11	0.01	0.00	0.00	0.00	0.00
38	0.07	0.01	0.00	0.00	0.00	0.00
39	0.05	0.00	0.00	0.00	0.00	0.00
40	0.03	0.00	0.00	0.00	0.00	0.00

TABLE 11

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Fe/Zr/SiO2
SAMPLE NO: 8670+12+23+17

REACTOR LOADING, MLS :	459.0	T, C :	241.2	FEED RATIO,	
CATALYST LOADING, WT%:	16.8	P, PSIG :	300	CO/H2:	1.00
TIME ON STREAM, HRS :	238.0	SV, L/G/HR:	1.0		

USAGE RATIO, CO/H2 :	0.54	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	33.59	MOL SYNGAS/KG CAT/HR:	14.974
%CO CONV- :	23.55	SPECIFIC ACTIVITY,	
%H2 CONV- :	43.66	MOL CO/MOL METAL/MIN:	0.088

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	8.01	H2O:	11.68
OXYGENATES :	0.22	CO :	75.25
CO2 :	0.89	H2 :	3.95

HYDROCARBON SELECTIVITY, WT%:

C1 :	10.22	C4+ENE :	4.51
C2+ANE :	2.10	C5+C11 :	29.23
C2+ENE :	0.36	C12+C18:	23.72
C3+ANE :	1.55	C19+C23:	10.03
C3+ENE :	5.60	C24+34 :	9.11
C4 ISO+ANE:	2.30	C35+ :	1.27

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	29.23
DIESEL (C9+C25) :	47.43

% ELEMENTAL RECOVERY:

CARBON :	93.20
HYDROGEN:	93.82
OXYGEN :	96.21

TABLE 12

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 17

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	10.22	43.17	0.00	0.00	0.00	0.00
2	2.10	4.74	0.36	0.87	0.00	0.00
3	1.55	2.38	5.60	9.02	0.00	0.00
4	2.21	2.58	4.51	5.44	0.09	0.10
5	2.58	2.42	4.39	4.24	0.28	0.26
6	4.69	3.69	0.17	0.13	0.00	0.00
7	1.97	1.33	1.07	0.74	0.16	0.11
8	1.66	0.98	0.92	0.56	0.26	0.16
9	2.19	1.16	1.16	0.62	0.57	0.30
10	2.40	1.14	1.09	0.52	0.43	0.21
11	2.13	0.92	0.72	0.32	0.37	0.16
12	2.22	0.88	0.56	0.23	0.36	0.14
13	2.32	0.85	0.34	0.13	0.44	0.16
14	2.63	0.90	0.00	0.00	0.46	0.16
15	2.70	0.86	0.00	0.00	0.48	0.15
16	3.14	0.94	0.00	0.00	0.57	0.17
17	3.49	0.98	0.00	0.00	0.71	0.20
18	2.85	0.76	0.00	0.00	0.44	0.12
19	2.39	0.60	0.00	0.00	0.15	0.04
20	2.10	0.50	0.00	0.00	0.13	0.03
21	1.86	0.42	0.00	0.00	0.11	0.03
22	1.64	0.36	0.00	0.00	0.10	0.02

TABLE 12 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670†12†23

SAMPLE NO. 17

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.46	0.30	0.00	0.00	0.09	0.02
24	1.30	0.26	0.00	0.00	0.08	0.02
25	1.17	0.22	0.00	0.00	0.07	0.01
26	1.08	0.20	0.00	0.00	0.05	0.01
27	0.94	0.17	0.00	0.00	0.04	0.01
28	0.82	0.14	0.00	0.00	0.05	0.01
29	0.70	0.12	0.00	0.00	0.04	0.01
30	0.63	0.10	0.00	0.00	0.04	0.01
31	0.55	0.09	0.00	0.00	0.03	0.00
32	0.54	0.08	0.00	0.00	0.02	0.00
33	0.49	0.07	0.00	0.00	0.00	0.00
34	0.45	0.06	0.00	0.00	0.02	0.00
35	0.38	0.05	0.00	0.00	0.00	0.00
36	0.30	0.04	0.00	0.00	0.00	0.00
37	0.23	0.03	0.00	0.00	0.00	0.00
38	0.16	0.02	0.00	0.00	0.00	0.00
39	0.13	0.02	0.00	0.00	0.00	0.00
40	0.07	0.01	0.00	0.00	0.00	0.00

TABLE 13

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Fe/Zr/SiO2
SAMPLE No: 8670+12+23+20

REACTOR LOADING, MLS :	459.0	T, C :	260.4	FEED RATIO,	
CATALYST LOADING, WT%:	16.8	P, PSIG :	298	CO/H2:	1.00
TIME ON STREAM, HRS :	262.0	SV, L/G/HR:	1.0		

USAGE RATIO, CO/H2 :	0.52	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	35.29	MOL SYNGAS/KG CAT/HR:	15.733
%CO CONV. :	24.20	SPECIFIC ACTIVITY,	
%H2 CONV. :	46.42	MOL CO/MOL METAL/MIN:	0.090

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	10.96	H20:	11.39
OXYGENATES :	0.15	CO :	71.31
CO2 :	2.60	H2 :	3.59

HYDROCARBON SELECTIVITY, WT%:

C1 :	9.57	C4+ENE :	4.10
C2+ANE :	2.08	C5+C11 :	26.66
C2+ENE :	0.38	C12+C18:	27.04
C3+ANE :	1.36	C19+C23:	12.91
C3+ENE :	4.98	C24+34 :	7.73
C4 ISO+ANE:	1.85	C35+ :	1.34

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	26.66
DIESEL (C9+C25) :	52.37

% ELEMENTAL RECOVERY:

CARBON :	100.53
HYDROGEN:	99.18
OXYGEN :	98.26

TABLE 14

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670†12†23

SAMPLE NO. 20

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	9.57	42.75	0.00	0.00	0.00	0.00
2	2.08	4.95	0.38	0.96	0.00	0.00
3	1.36	2.20	4.98	8.47	0.00	0.00
4	1.78	2.19	4.10	5.23	0.07	0.09
5	2.26	2.24	4.34	4.43	0.23	0.23
6	4.08	3.39	0.26	0.22	0.00	0.00
7	1.78	1.27	0.88	0.65	0.27	0.19
8	1.49	0.94	0.80	0.51	0.36	0.22
9	1.61	0.90	1.04	0.59	0.66	0.37
10	1.65	0.83	0.96	0.49	0.89	0.45
11	1.64	0.75	0.66	0.30	0.81	0.37
12	1.67	0.70	0.48	0.20	0.53	0.22
13	1.78	0.69	0.35	0.14	0.49	0.19
14	2.53	0.91	0.00	0.00	0.59	0.21
15	3.31	1.12	0.00	0.00	0.80	0.27
16	3.87	1.22	0.00	0.00	0.81	0.26
17	4.40	1.31	0.00	0.00	0.88	0.26
18	3.76	1.06	0.00	0.00	0.80	0.22
19	3.34	0.89	0.00	0.00	0.27	0.07
20	2.83	0.72	0.00	0.00	0.23	0.06
21	2.33	0.56	0.00	0.00	0.19	0.05
22	1.90	0.44	0.00	0.00	0.15	0.04

TABLE 14 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 20

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.55	0.34	0.00	0.00	0.12	0.03
24	1.27	0.27	0.00	0.00	0.10	0.02
25	1.07	0.22	0.00	0.00	0.08	0.02
26	0.90	0.18	0.00	0.00	0.06	0.01
27	0.76	0.14	0.00	0.00	0.05	0.01
28	0.66	0.12	0.00	0.00	0.05	0.01
29	0.56	0.10	0.00	0.00	0.04	0.01
30	0.50	0.08	0.00	0.00	0.04	0.01
31	0.45	0.07	0.00	0.00	0.03	0.01
32	0.38	0.06	0.00	0.00	0.03	0.00
33	0.34	0.05	0.00	0.00	0.03	0.00
34	0.33	0.05	0.00	0.00	0.02	0.00
35	0.33	0.05	0.00	0.00	0.00	0.00
36	0.29	0.04	0.00	0.00	0.00	0.00
37	0.24	0.03	0.00	0.00	0.00	0.00
38	0.19	0.03	0.00	0.00	0.00	0.00
39	0.17	0.02	0.00	0.00	0.00	0.00
40	0.13	0.02	0.00	0.00	0.00	0.00

TABLE 15

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Fe/Zr/SiO2
SAMPLE No: 8670+12+23+23

REACTOR LOADING, MLS :	459.0	T, C :	261.0	FEED RATIO,	
CATALYST LOADING, WT%:	16.8	P, PSIG :	300	CO/H2:	1.50
TIME ON STREAM, HRS :	285.4	SV, L/G/HR:	1.0		

USAGE RATIO, CO/H2 :	0.61	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	33.03	MOL SYNGAS/KG CAT/HR:	14.762
%CO CONV. :	20.78	SPECIFIC ACTIVITY,	
%H2 CONV. :	51.43	MOL CO/MOL METAL/MIN:	0.093

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	8.86	H2O:	11.16
OXYGENATES :	0.13	CO :	75.45
CO2 :	2.20	H2 :	2.20

HYDROCARBON SELECTIVITY, WT%:

C1 :	6.26	C4+ENE :	3.25
C2+ANE :	1.35	C5+C11 :	29.00
C2+ENE :	0.35	C12+C18:	32.88
C3+ANE :	0.71	C19+C23:	12.41
C3+ENE :	3.70	C24+34 :	7.67
C4 ISO+ANE:	1.07	C35+ :	1.35

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	29.00
DIESEL (C9+C25) :	60.11

% ELEMENTAL RECOVERY:

CARBON :	99.12
HYDROGEN:	107.15
OXYGEN :	100.47

TABLE 16

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 23

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	6.26	34.53	0.00	0.00	0.00	0.00
2	1.35	3.98	0.35	1.09	0.00	0.00
3	0.71	1.43	3.70	7.79	0.00	0.00
4	1.03	1.56	3.25	5.12	0.04	0.07
5	1.49	1.82	3.62	4.56	0.19	0.23
6	4.78	4.91	0.34	0.36	0.00	0.00
7	1.90	1.68	1.15	1.04	0.33	0.29
8	1.63	1.27	0.96	0.75	0.41	0.32
9	1.71	1.18	1.24	0.87	0.72	0.50
10	1.87	1.16	1.23	0.78	1.17	0.73
11	2.07	1.17	0.94	0.54	1.26	0.71
12	2.15	1.12	0.86	0.45	0.98	0.51
13	2.33	1.12	0.73	0.35	1.02	0.49
14	3.24	1.45	0.00	0.00	1.07	0.48
15	3.71	1.55	0.00	0.00	1.20	0.50
16	4.26	1.67	0.00	0.00	1.30	0.51
17	4.43	1.63	0.00	0.00	1.29	0.47
18	3.30	1.15	0.00	0.00	1.01	0.35
19	2.98	0.98	0.00	0.00	0.27	0.09
20	2.62	0.82	0.00	0.00	0.23	0.07
21	2.24	0.67	0.00	0.00	0.25	0.07
22	1.88	0.54	0.00	0.00	0.20	0.06

TABLE 16 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670†12†23

SAMPLE NO. 23

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.57	0.43	0.00	0.00	0.16	0.04
24	1.30	0.34	0.00	0.00	0.13	0.03
25	1.09	0.27	0.00	0.00	0.10	0.02
26	0.90	0.22	0.00	0.00	0.07	0.02
27	0.74	0.17	0.00	0.00	0.06	0.01
28	0.63	0.14	0.00	0.00	0.07	0.01
29	0.53	0.11	0.00	0.00	0.05	0.01
30	0.47	0.10	0.00	0.00	0.04	0.01
31	0.41	0.08	0.00	0.00	0.03	0.01
32	0.36	0.07	0.00	0.00	0.02	0.00
33	0.32	0.06	0.00	0.00	0.02	0.00
34	0.33	0.06	0.00	0.00	0.01	0.00
35	0.34	0.06	0.00	0.00	0.00	0.00
36	0.29	0.05	0.00	0.00	0.00	0.00
37	0.24	0.04	0.00	0.00	0.00	0.00
38	0.20	0.03	0.00	0.00	0.00	0.00
39	0.16	0.03	0.00	0.00	0.00	0.00
40	0.12	0.02	0.00	0.00	0.00	0.00

TABLE 17

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Fe/Zr/SiO2
SAMPLE No: 8670+12+23+26

REACTOR LOADING, MLS :	459.0	T, C :	260.5	FEED RATIO,	
CATALYST LOADING, WT%:	16.8	P, PSIG :	300	CO/H2:	2.03
TIME ON STREAM, HRS :	310	SV, L/G/HR:	1.0		

USAGE RATIO, CO/H2 :	0.67	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	31.33	MOL SYNGAS/KG CAT/HR:	13.991
%CO CONV. :	18.80	SPECIFIC ACTIVITY,	
%H2 CONV. :	56.77	MOL CO/MOL METAL/MIN:	0.094

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	5.65	H2O:	9.23
OXYGENATES :	0.10	CO :	81.47
CO2 :	2.02	H2 :	1.53

HYDROCARBON SELECTIVITY, WT%:

C1 :	7.47	C4+ENE :	3.94
C2+ANE :	1.46	C5+C11 :	32.75
C2+ENE :	0.47	C12+C18:	30.83
C3+ANE :	0.76	C19+C23:	10.94
C3+ENE :	4.48	C24+34 :	5.33
C4 ISO+ANE:	1.10	C35+ :	0.47

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	32.75
DIESEL (C9+C25) :	57.63

% ELEMENTAL RECOVERY:

CARBON :	93.65
HYDROGEN:	98.12
OXYGEN :	98.13

TABLE 18

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 26

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	7.47	36.82	0.00	0.00	0.00	0.00
2	1.46	3.85	0.47	1.33	0.00	0.00
3	0.76	1.37	4.48	8.40	0.00	0.00
4	1.10	1.49	3.94	5.54	0.00	0.00
5	1.65	1.80	4.60	5.18	0.19	0.20
6	5.46	5.01	0.39	0.37	0.00	0.00
7	2.20	1.73	1.17	0.94	0.38	0.30
8	1.76	1.22	0.93	0.66	0.48	0.33
9	1.72	1.06	1.32	0.83	0.93	0.57
10	1.86	1.03	1.46	0.82	1.71	0.95
11	1.66	0.84	1.13	0.58	1.74	0.88
12	1.96	0.91	1.02	0.48	1.70	0.79
13	2.08	0.89	0.87	0.38	1.44	0.62
14	2.33	0.93	0.61	0.24	1.39	0.55
15	3.06	1.14	0.00	0.00	1.38	0.51
16	3.37	1.18	0.00	0.00	1.38	0.48
17	3.34	1.10	0.00	0.00	1.39	0.46
18	2.52	0.78	0.00	0.00	1.01	0.31
19	2.34	0.69	0.00	0.00	0.26	0.08
20	2.21	0.62	0.00	0.00	0.26	0.07
21	2.01	0.54	0.00	0.00	0.25	0.07
22	1.74	0.44	0.00	0.00	0.22	0.06

TABLE 18 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 26

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.45	0.35	0.00	0.00	0.18	0.04
24	1.17	0.27	0.00	0.00	0.14	0.03
25	0.91	0.20	0.00	0.00	0.11	0.02
26	0.69	0.15	0.00	0.00	0.07	0.02
27	0.52	0.11	0.00	0.00	0.05	0.01
28	0.39	0.08	0.00	0.00	0.06	0.01
29	0.30	0.06	0.00	0.00	0.03	0.01
30	0.23	0.04	0.00	0.00	0.02	0.00
31	0.19	0.03	0.00	0.00	0.02	0.00
32	0.15	0.03	0.00	0.00	0.01	0.00
33	0.14	0.02	0.00	0.00	0.01	0.00
34	0.13	0.02	0.00	0.00	0.01	0.00
35	0.11	0.02	0.00	0.00	0.00	0.00
36	0.10	0.02	0.00	0.00	0.00	0.00
37	0.08	0.01	0.00	0.00	0.00	0.00
38	0.07	0.01	0.00	0.00	0.00	0.00
39	0.06	0.01	0.00	0.00	0.00	0.00
40	0.05	0.01	0.00	0.00	0.00	0.00

TABLE 19

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Fe/Zr/SiO2
SAMPLE No: 8670+12+23+32

REACTOR LOADING, MLS :	459.0	T, C :	260.5	FEED RATIO,	
CATALYST LOADING, WT%:	16.8	P, PSIG :	300	CO/H2:	1.50
TIME ON STREAM, HRS :	406.5	SV, L/G/HR:	2.0		

USAGE RATIO, CO/H2 :	0.46	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	22.92	MOL SYNGAS/KG CAT/HR:	20.467
%CO CONV. :	12.04	SPECIFIC ACTIVITY,	
%H2 CONV. :	39.25	MOL CO/MOL METAL/MIN:	0.108

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	4.59	H20:	6.44
OXYGENATES :	0.15	CO :	85.56
CO2 :	0.45	H2 :	2.81

HYDROCARBON SELECTIVITY, WT%:

C1 :	10.36	C4+ENE :	5.19
C2+ANE :	2.32	C5+C11 :	36.03
C2+ENE :	0.46	C12+C18:	26.11
C3+ANE :	1.45	C19+C23:	6.28
C3+ENE :	5.83	C24+34 :	3.41
C4 ISO+ANE:	2.19	C35+ :	0.36

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	36.03
DIESEL (C9+C25) :	47.19

% ELEMENTAL RECOVERY:

CARBON :	97.64
HYDROGEN:	92.86
OXYGEN :	98.96

TABLE 20

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 32

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	10.36	41.34	0.00	0.00	0.00	0.00
2	2.32	4.94	0.46	1.05	0.00	0.00
3	1.45	2.10	5.83	8.87	0.00	0.00
4	2.09	2.30	5.19	5.93	0.10	0.11
5	2.78	2.46	5.63	5.14	0.34	0.30
6	6.03	4.48	0.30	0.23	0.00	0.00
7	2.71	1.73	1.06	0.69	0.29	0.19
8	2.16	1.21	0.84	0.48	0.38	0.21
9	2.73	1.36	0.98	0.50	0.74	0.37
10	3.99	1.80	0.01	0.00	0.86	0.39
11	3.23	1.32	0.01	0.01	0.96	0.39
12	3.08	1.16	0.02	0.01	1.07	0.40
13	2.28	0.79	0.60	0.21	1.10	0.38
14	2.22	0.72	0.49	0.16	1.11	0.36
15	2.18	0.66	0.36	0.11	1.11	0.34
16	2.19	0.62	0.00	0.00	1.39	0.39
17	2.29	0.61	0.00	0.00	1.37	0.36
18	2.04	0.51	0.00	0.00	1.21	0.30
19	1.49	0.36	0.00	0.00	0.47	0.11
20	1.13	0.26	0.00	0.00	0.25	0.06
21	0.95	0.20	0.00	0.00	0.18	0.04
22	0.82	0.17	0.00	0.00	0.15	0.03

TABLE 20 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 32

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.71	0.14	0.00	0.00	0.13	0.03
24	0.60	0.11	0.00	0.00	0.10	0.02
25	0.49	0.09	0.00	0.00	0.08	0.02
26	0.40	0.07	0.00	0.00	0.06	0.01
27	0.32	0.05	0.00	0.00	0.05	0.01
28	0.26	0.04	0.00	0.00	0.04	0.01
29	0.21	0.03	0.00	0.00	0.03	0.00
30	0.18	0.03	0.00	0.00	0.03	0.00
31	0.15	0.02	0.00	0.00	0.02	0.00
32	0.13	0.02	0.00	0.00	0.01	0.00
33	0.11	0.01	0.00	0.00	0.01	0.00
34	0.10	0.01	0.00	0.00	0.01	0.00
35	0.10	0.01	0.00	0.00	0.00	0.00
36	0.08	0.01	0.00	0.00	0.00	0.00
37	0.06	0.01	0.00	0.00	0.00	0.00
38	0.05	0.01	0.00	0.00	0.00	0.00
39	0.04	0.00	0.00	0.00	0.00	0.00
40	0.03	0.00	0.00	0.00	0.00	0.00

TABLE 21

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Fe/Zr/SiO2
SAMPLE No: 8670+12+23+35

REACTOR LOADING, MLS :	459.0	T, C :	261.1	FEED RATIO,	
CATALYST LOADING, WT%:	16.8	P, PSIG :	300	CO/H2:	1.00
TIME ON STREAM, HRS :	430.5	SV, L/G/HR:	2.0		

USAGE RATIO, CO/H2 :	0.46	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	33.91	MOL SYNGAS/KG CAT/HR:	30.286
%CO CONV. :	21.40	SPECIFIC ACTIVITY,	
%H2 CONV. :	46.43	MOL CO/MOL METAL/MIN:	0.159

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	8.32	H2O:	11.02
OXYGENATES :	0.30	CO :	75.77
CO2 :	0.90	H2 :	3.69

HYDROCARBON SELECTIVITY, WT%:

C1 :	13.08	C4+ENE :	4.75
C2+ANE :	3.12	C5+C11 :	39.68
C2+ENE :	0.29	C12+C18:	17.05
C3+ANE :	2.66	C19+C23:	5.51
C3+ENE :	5.54	C24+34 :	4.27
C4 ISO+ANE:	3.49	C35+ :	0.54

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	39.68
DIESEL (C9+C25) :	38.33

% ELEMENTAL RECOVERY:

CARBON :	96.30
HYDROGEN:	92.19
OXYGEN :	97.79

TABLE 22

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 35

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	13.08	45.82	0.00	0.00	0.00	0.00
2	3.12	5.83	0.29	0.59	0.00	0.00
3	2.66	3.39	5.54	7.40	0.00	0.00
4	3.39	3.27	4.75	4.75	0.11	0.10
5	4.01	3.12	4.71	3.77	0.41	0.32
6	6.22	4.05	0.48	0.32	0.00	0.00
7	3.07	1.72	1.03	0.59	0.66	0.37
8	2.76	1.36	0.90	0.45	0.95	0.47
9	3.64	1.59	0.76	0.34	1.31	0.57
10	3.19	1.26	0.73	0.29	1.28	0.50
11	2.27	0.81	0.51	0.18	0.79	0.28
12	2.06	0.68	0.44	0.15	0.76	0.25
13	1.88	0.57	0.35	0.11	0.74	0.22
14	1.95	0.55	0.00	0.00	0.69	0.20
15	1.66	0.44	0.00	0.00	0.63	0.17
16	1.44	0.36	0.00	0.00	0.57	0.14
17	1.36	0.32	0.00	0.00	0.59	0.14
18	1.33	0.29	0.00	0.00	0.60	0.13
19	1.08	0.23	0.00	0.00	0.52	0.11
20	0.81	0.16	0.00	0.00	0.42	0.08
21	0.66	0.12	0.00	0.00	0.36	0.07
22	0.57	0.10	0.00	0.00	0.31	0.06

TABLE 22 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 35

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.50	0.09	0.00	0.00	0.28	0.05
24	0.44	0.07	0.00	0.00	0.25	0.04
25	0.38	0.06	0.00	0.00	0.23	0.04
26	0.33	0.05	0.00	0.00	0.21	0.03
27	0.28	0.04	0.00	0.00	0.20	0.03
28	0.24	0.03	0.00	0.00	0.18	0.03
29	0.20	0.03	0.00	0.00	0.16	0.02
30	0.18	0.02	0.00	0.00	0.14	0.02
31	0.15	0.02	0.00	0.00	0.12	0.02
32	0.13	0.02	0.00	0.00	0.10	0.01
33	0.11	0.01	0.00	0.00	0.08	0.01
34	0.11	0.01	0.00	0.00	0.05	0.01
35	0.13	0.02	0.00	0.00	0.00	0.00
36	0.12	0.01	0.00	0.00	0.00	0.00
37	0.10	0.01	0.00	0.00	0.00	0.00
38	0.08	0.01	0.00	0.00	0.00	0.00
39	0.07	0.01	0.00	0.00	0.00	0.00
40	0.04	0.00	0.00	0.00	0.00	0.00

TABLE 23

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Fe/Zr/SiO2
SAMPLE NO: 8670+12+23+38

REACTOR LOADING, MLS :	459.0	T, C :	260.2	FEED RATIO,	
CATALYST LOADING, WT%:	16.8	P, PSIG :	597	CO/H2:	1.09
TIME ON STREAM, HRS :	454.5	SV, L/G/HR:	2.0		

USAGE RATIO, CO/H2 :	0.58	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	35.52	MOL SYNGAS/KG CAT/HR:	31.722
%CO CONV. :	24.95	SPECIFIC ACTIVITY,	
%H2 CONV. :	47.08	MOL CO/MOL METAL/MIN:	0.194

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	10.77	H20:	7.12
OXYGENATES :	0.28	CO :	76.54
CO2 :	1.76	H2 :	3.52

HYDROCARBON SELECTIVITY, WT%:

C1 :	10.77	C4+ENE :	4.60
C2+ANE :	2.49	C5+C11 :	30.33
C2+ENE :	0.28	C12+C18:	21.19
C3+ANE :	2.15	C19+C23:	11.44
C3+ENE :	5.43	C24+34 :	7.65
C4 ISO+ANE:	3.03	C35+ :	0.65

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	30.33
DIESEL (C9+C25) :	46.42

% ELEMENTAL RECOVERY:

CARBON :	97.06
HYDROGEN:	91.91
OXYGEN :	88.30

TABLE 24

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 38

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	10.77	43.41	0.00	0.00	0.00	0.00
2	2.49	5.36	0.28	0.64	0.00	0.00
3	2.15	3.15	5.43	8.34	0.00	0.00
4	2.90	3.22	4.60	5.30	0.13	0.15
5	3.23	2.89	4.49	4.14	0.38	0.34
6	4.74	3.56	0.24	0.18	0.00	0.00
7	2.13	1.37	0.79	0.52	0.40	0.26
8	1.80	1.02	0.68	0.39	0.51	0.29
9	2.39	1.21	0.73	0.37	0.67	0.34
10	3.16	1.44	0.05	0.03	0.70	0.32
11	2.55	1.05	0.06	0.02	0.63	0.26
12	2.36	0.90	0.07	0.03	0.62	0.24
13	2.31	0.81	0.00	0.00	0.67	0.24
14	2.23	0.73	0.00	0.00	0.60	0.20
15	2.20	0.67	0.00	0.00	0.61	0.18
16	2.23	0.64	0.00	0.00	0.63	0.18
17	2.45	0.66	0.00	0.00	0.74	0.20
18	2.57	0.65	0.00	0.00	0.90	0.23
19	2.36	0.57	0.00	0.00	0.34	0.08
20	2.22	0.51	0.00	0.00	0.34	0.08
21	2.01	0.44	0.00	0.00	0.32	0.07
22	1.77	0.37	0.00	0.00	0.29	0.06

TABLE 24 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 38

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.53	0.30	0.00	0.00	0.25	0.05
24	1.30	0.25	0.00	0.00	0.20	0.04
25	1.19	0.22	0.00	0.00	0.16	0.03
26	0.89	0.16	0.00	0.00	0.13	0.02
27	0.72	0.12	0.00	0.00	0.10	0.02
28	0.59	0.10	0.00	0.00	0.13	0.02
29	0.49	0.08	0.00	0.00	0.09	0.01
30	0.41	0.06	0.00	0.00	0.07	0.01
31	0.34	0.05	0.00	0.00	0.04	0.01
32	0.28	0.04	0.00	0.00	0.03	0.00
33	0.24	0.03	0.00	0.00	0.02	0.00
34	0.20	0.03	0.00	0.00	0.01	0.00
35	0.18	0.02	0.00	0.00	0.00	0.00
36	0.16	0.02	0.00	0.00	0.00	0.00
37	0.12	0.01	0.00	0.00	0.00	0.00
38	0.08	0.01	0.00	0.00	0.00	0.00
39	0.06	0.01	0.00	0.00	0.00	0.00
40	0.04	0.00	0.00	0.00	0.00	0.00

TABLE 25

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Fe/Zr/SiO2
SAMPLE NO: 8670+12+23+41

REACTOR LOADING, MLS :	459.0	T, C :	280.7	FEED RATIO,	
CATALYST LOADING, WT%:	16.8	P, PSIG :	308	CO/H2:	1.05
TIME ON STREAM, HRS :	477.9	SV, L/G/HR:	2.0		

USAGE RATIO, CO/H2 :	0.65	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	50.82	MOL SYNGAS/KG CAT/HR:	45.367
%CO CONV. :	38.83	SPECIFIC ACTIVITY,	
%H2 CONV. :	63.46	MOL CO/MOL METAL/MIN:	0.297

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	13.26	H2O:	14.56
OXYGENATES :	0.32	CO :	60.43
CO2 :	8.98	H2 :	2.44

HYDROCARBON SELECTIVITY, WT%:

C1 :	22.96	C4+ENE :	5.05
C2+ANE :	5.49	C5+C11 :	34.37
C2+ENE :	0.29	C12+C18:	12.56
C3+ANE :	4.91	C19+C23:	3.32
C3+ENE :	4.89	C24+34 :	1.67
C4 ISO+ANE:	4.40	C35+ :	0.08

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	34.37
DIESEL (C9+C25) :	27.87

% ELEMENTAL RECOVERY:

CARBON :	93.02
HYDROGEN:	96.99
OXYGEN :	95.88

TABLE 26

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 41

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	22.96	58.41	0.00	0.00	0.00	0.00
2	5.49	7.45	0.29	0.43	0.00	0.00
3	4.91	4.55	4.89	4.74	0.00	0.00
4	4.27	3.00	5.05	3.67	0.13	0.09
5	4.34	2.45	4.28	2.49	0.68	0.38
6	5.24	2.48	0.80	0.39	0.00	0.00
7	2.81	1.14	0.38	0.16	0.90	0.37
8	2.25	0.80	0.40	0.14	1.04	0.37
9	2.43	0.77	0.35	0.11	1.43	0.45
10	1.91	0.55	0.37	0.11	1.56	0.45
11	1.47	0.38	0.27	0.07	1.46	0.38
12	1.33	0.32	0.21	0.05	1.13	0.27
13	1.39	0.31	0.34	0.08	0.60	0.13
14	1.24	0.25	0.00	0.00	0.79	0.16
15	0.95	0.18	0.00	0.00	0.44	0.08
16	0.96	0.17	0.00	0.00	0.45	0.08
17	0.96	0.16	0.00	0.00	0.42	0.07
18	0.91	0.15	0.00	0.00	0.44	0.07
19	0.74	0.11	0.00	0.00	0.15	0.02
20	0.54	0.08	0.00	0.00	0.12	0.02
21	0.57	0.08	0.00	0.00	0.10	0.01
22	0.48	0.06	0.00	0.00	0.11	0.01

TABLE 26 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 41

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.43	0.05	0.00	0.00	0.08	0.01
24	0.36	0.04	0.00	0.00	0.07	0.01
25	0.27	0.03	0.00	0.00	0.05	0.01
26	0.23	0.03	0.00	0.00	0.04	0.00
27	0.17	0.02	0.00	0.00	0.02	0.00
28	0.12	0.01	0.00	0.00	0.01	0.00
29	0.09	0.01	0.00	0.00	0.01	0.00
30	0.07	0.01	0.00	0.00	0.01	0.00
31	0.05	0.00	0.00	0.00	0.01	0.00
32	0.04	0.00	0.00	0.00	0.00	0.00
33	0.03	0.00	0.00	0.00	0.00	0.00
34	0.03	0.00	0.00	0.00	0.00	0.00
35	0.02	0.00	0.00	0.00	0.00	0.00
36	0.02	0.00	0.00	0.00	0.00	0.00
37	0.01	0.00	0.00	0.00	0.00	0.00
38	0.01	0.00	0.00	0.00	0.00	0.00
39	0.01	0.00	0.00	0.00	0.00	0.00
40	0.01	0.00	0.00	0.00	0.00	0.00

TABLE 27

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Fe/Zr/SiO2
SAMPLE No: 8670+12+23+44

REACTOR LOADING, MLS :	459.0	T, C :	280.5	FEED RATIO,	
CATALYST LOADING, WT%:	16.8	P, PSIG :	312	CO/H2:	1.50
TIME ON STREAM, HRS :	503.2	SV, L/G/HR:	2.0		

USAGE RATIO, CO/H2 :	0.62	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	40.64	MOL SYNGAS/KG CAT/HR:	36.299
%CO CONV. :	25.82	SPECIFIC ACTIVITY,	
%H2 CONV. :	62.90	MOL CO/MOL METAL/MIN:	0.231

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	8.38	H20:	12.72
OXYGENATES :	0.26	CO :	71.38
CO2 :	5.56	H2 :	1.70

HYDROCARBON SELECTIVITY, WT%:

C1 :	17.94	C4+ENE :	5.73
C2+ANE :	4.26	C5+C11 :	36.83
C2+ENE :	0.39	C12+C18:	15.02
C3+ANE :	3.14	C19+C23:	5.97
C3+ENE :	5.96	C24+34 :	1.69
C4 ISO+ANE:	3.06	C35+ :	0.00

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	36.83
DIESEL (C9+C25) :	33.31

% ELEMENTAL RECOVERY:

CARBON :	94.97
HYDROGEN:	100.40
OXYGEN :	102.28

TABLE 28

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 44

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	17.94	52.65	0.00	0.00	0.00	0.00
2	4.26	6.67	0.39	0.66	0.00	0.00
3	3.14	3.35	5.96	6.66	0.00	0.00
4	2.97	2.40	5.73	4.80	0.09	0.07
5	3.68	2.40	5.79	3.88	0.50	0.33
6	6.49	3.54	0.67	0.38	0.00	0.00
7	3.37	1.58	0.53	0.25	0.78	0.36
8	2.34	0.97	0.48	0.20	0.96	0.40
9	2.31	0.85	0.38	0.14	1.30	0.48
10	1.78	0.59	0.47	0.16	1.52	0.50
11	1.49	0.45	0.38	0.11	1.63	0.49
12	1.33	0.37	0.31	0.09	1.36	0.38
13	1.33	0.34	0.21	0.05	1.21	0.31
14	1.25	0.30	0.00	0.00	0.90	0.21
15	1.10	0.24	0.00	0.00	0.74	0.16
16	1.02	0.21	0.00	0.00	0.65	0.14
17	1.15	0.23	0.00	0.00	0.60	0.12
18	1.29	0.24	0.00	0.00	0.58	0.11
19	1.26	0.22	0.00	0.00	0.41	0.07
20	1.13	0.19	0.00	0.00	0.30	0.05
21	0.96	0.15	0.00	0.00	0.21	0.03
22	0.80	0.12	0.00	0.00	0.17	0.03

TABLE 28 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 44

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.63	0.09	0.00	0.00	0.11	0.02
24	0.47	0.07	0.00	0.00	0.15	0.02
25	0.36	0.05	0.00	0.00	0.09	0.01
26	0.21	0.03	0.00	0.00	0.05	0.01
27	0.14	0.02	0.00	0.00	0.03	0.00
28	0.10	0.01	0.00	0.00	0.00	0.00
29	0.06	0.01	0.00	0.00	0.00	0.00
30	0.02	0.00	0.00	0.00	0.00	0.00
31	0.01	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 29

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Fe/Zr/SiO2
SAMPLE NO: 8570+12+23+47

REACTOR LOADING, MLS :	459.0	T, C :	279.9	FEED RATIO,	
CATALYST LOADING, WT%:	16.8	P, PSIG :	315	CO/H2:	2.03
TIME ON STREAM, HRS :	574.7	SV, L/G/HR:	2.0		

USAGE RATIO, CO/H2 :	0.59	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	27.33	MOL SYNGAS/KG CAT/HR:	24.405
%CO CONV. :	15.18	SPECIFIC ACTIVITY,	
%H2 CONV. :	51.99	MOL CO/MOL METAL/MIN:	0.151

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	5.20	H20:	6.99
OXYGENATES :	0.16	CO :	84.30
CO2 :	1.67	H2 :	1.68

HYDROCARBON SELECTIVITY, WT%:

C1 :	15.77	C4+ENE :	5.55
C2+ANE :	3.52	C5+C11 :	41.76
C2+ENE :	0.65	C12+C18:	18.18
C3+ANE :	1.80	C19+C23:	3.60
C3+ENE :	6.07	C24+34 :	1.19
C4 ISO+ANE:	1.92	C35+ :	0.00

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	41.76
DIESEL (C9+C25) :	36.93

% ELEMENTAL RECOVERY:

CARBON :	96.21
HYDROGEN:	96.07
OXYGEN :	98.00

TABLE 30

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 47

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	15.77	50.08	0.00	0.00	0.00	0.00
2	3.52	5.97	0.65	1.17	0.00	0.00
3	1.80	2.08	6.47	7.34	0.00	0.00
4	1.84	1.61	5.55	5.03	0.08	0.07
5	2.42	1.71	5.53	4.02	0.30	0.21
6	7.46	4.41	0.83	0.50	0.00	0.00
7	4.25	2.16	0.86	0.45	0.81	0.41
8	3.14	1.40	0.73	0.33	0.90	0.40
9	3.44	1.36	0.98	0.39	0.39	0.15
10	2.04	0.73	1.20	0.43	2.20	0.79
11	1.55	0.50	0.82	0.27	1.92	0.63
12	1.40	0.42	0.70	0.21	1.55	0.46
13	1.32	0.36	0.55	0.15	1.35	0.37
14	1.16	0.30	0.41	0.11	1.17	0.30
15	1.08	0.26	0.26	0.06	1.05	0.25
16	1.13	0.25	0.00	0.00	1.02	0.23
17	1.09	0.23	0.00	0.00	1.01	0.21
18	1.04	0.21	0.00	0.00	0.86	0.17
19	0.80	0.15	0.00	0.00	0.54	0.10
20	0.60	0.11	0.00	0.00	0.31	0.06
21	0.44	0.07	0.00	0.00	0.08	0.01
22	0.37	0.06	0.00	0.00	0.09	0.01

TABLE 30 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 47

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.32	0.05	0.00	0.00	0.06	0.01
24	0.25	0.04	0.00	0.00	0.10	0.01
25	0.22	0.03	0.00	0.00	0.06	0.01
26	0.15	0.02	0.00	0.00	0.03	0.00
27	0.12	0.02	0.00	0.00	0.03	0.00
28	0.09	0.01	0.00	0.00	0.01	0.00
29	0.06	0.01	0.00	0.00	0.00	0.00
30	0.03	0.00	0.00	0.00	0.00	0.00
31	0.02	0.00	0.00	0.00	0.00	0.00
32	0.01	0.00	0.00	0.00	0.00	0.00
33	0.01	0.00	0.00	0.00	0.00	0.00
34	0.01	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 31

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Fe/Zr/SiO2
SAMPLE NO: 8670+12+23+50

REACTOR LOADING, MLS :	459.0	T, C :	260.2	FEED RATIO,	
CATALYST LOADING, WT%:	16.8	P, PSIG :	315	CO/H2:	1.01
TIME ON STREAM, HRS :	598.2	SV, L/G/HR:	2.0		

USAGE RATIO, CO/H2 :	0.50	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	29.38	MOL SYNGAS/KG CAT/HR:	26.108
%CO CONV. :	19.36	SPECIFIC ACTIVITY,	
%H2 CONV. :	39.53	MOL CO/MOL METAL/MIN:	0.144

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	6.82	H20:	8.73
OXYGENATES :	0.32	CO :	78.89
CO2 :	1.07	H2 :	4.17

HYDROCARBON SELECTIVITY, WT%:

C1 :	19.76	C4+ENE :	5.32
C2+ANE :	4.70	C5+C11 :	34.35
C2+ENE :	0.45	C12+C18:	13.08
C3+ANE :	3.50	C19+C23:	6.38
C3+ENE :	6.40	C24+34 :	2.12
C4 ISO+ANE:	3.94	C35+ :	0.00

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	34.35
DIESEL (C9+C25) :	30.67

% ELEMENTAL RECOVERY:

CARBON :	95.13
HYDROGEN:	92.41
OXYGEN :	96.15

TABLE 32

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670†12†23

SAMPLE NO. 50

CARBON NO.	n†ALKANES WT %	n†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	19.76	54.77	0.00	0.00	0.00	0.00
2	4.70	6.95	0.45	0.72	0.00	0.00
3	3.50	3.53	6.40	6.75	0.00	0.00
4	3.80	2.90	5.32	4.21	0.14	0.10
5	4.28	2.63	4.41	2.79	0.45	0.28
6	3.35	1.73	3.54	1.87	0.00	0.00
7	4.33	1.92	0.37	0.17	0.00	0.00
8	2.90	1.13	0.45	0.18	0.33	0.13
9	2.81	0.97	0.42	0.15	0.47	0.16
10	2.43	0.76	0.47	0.15	0.50	0.16
11	1.53	0.43	0.28	0.08	1.05	0.30
12	1.34	0.35	0.28	0.07	0.49	0.13
13	1.22	0.29	0.16	0.04	1.08	0.26
14	1.05	0.23	0.00	0.00	1.01	0.23
15	0.81	0.17	0.45	0.09	0.48	0.10
16	1.01	0.20	0.00	0.00	0.45	0.09
17	0.96	0.18	0.00	0.00	0.50	0.09
18	1.12	0.20	0.00	0.00	0.68	0.12
19	1.17	0.19	0.00	0.00	0.52	0.09
20	1.07	0.17	0.00	0.00	0.55	0.09
21	0.91	0.14	0.00	0.00	0.38	0.06
22	0.80	0.11	0.00	0.00	0.17	0.02

TABLE 32 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 50

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.68	0.09	0.00	0.00	0.13	0.02
24	0.54	0.07	0.00	0.00	0.20	0.03
25	0.40	0.05	0.00	0.00	0.13	0.02
26	0.27	0.03	0.00	0.00	0.08	0.01
27	0.19	0.02	0.00	0.00	0.05	0.01
28	0.13	0.01	0.00	0.00	0.00	0.00
29	0.08	0.01	0.00	0.00	0.00	0.00
30	0.03	0.00	0.00	0.00	0.00	0.00
31	0.02	0.00	0.00	0.00	0.00	0.00
32	0.01	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 33

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Fe/Zr/SiO2
SAMPLE No: 8670+12+23+53

REACTOR LOADING, MLS :	459.0	T, C :	240.2	FEED RATIO,	
CATALYST LOADING, WT%:	16.8	P, PSIG :	314	CO/H2:	1.00
TIME ON STREAM, HRS :	623	SV, L/G/HR:	2.0		

USAGE RATIO, CO/H2 :	0.53	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	20.32	MOL SYNGAS/KG CAT/HR:	18.144
%CO CONV. :	14.10	SPECIFIC ACTIVITY,	
%H2 CONV. :	26.57	MOL CO/MOL METAL/MIN:	0.105

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	3.85	H2O:	4.76
OXYGENATES :	0.14	CO :	85.73
CO2 :	0.31	H2 :	5.21

HYDROCARBON SELECTIVITY, WT%:

C1 :	17.46	C4+ENE :	5.92
C2+ANE :	3.62	C5+C11 :	27.62
C2+ENE :	0.61	C12+C18:	14.10
C3+ANE :	2.53	C19+C23:	11.39
C3+ENE :	7.19	C24+34 :	6.24
C4 ISO+ANE:	3.32	C35+ :	0.00

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	27.62
DIESEL (C9+C25) :	35.23

% ELEMENTAL RECOVERY:

CARBON :	93.70
HYDROGEN:	90.42
OXYGEN :	93.82

TABLE 34

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+12+23

SAMPLE NO. 53

CARBON NO.	N+ALKANES		1+ALKENE		BRANCHED ISOMERS	
	WT %	MOLE %	WT %	MOLE %	WT %	MOLE %
1	17.46	53.16	0.00	0.00	0.00	0.00
2	3.62	5.88	0.61	1.06	0.00	0.00
3	2.53	2.80	7.19	8.33	0.00	0.00
4	3.19	2.68	5.92	5.15	0.12	0.10
5	3.56	2.41	5.83	4.06	0.34	0.23
6	5.17	2.93	0.20	0.12	0.00	0.00
7	3.18	1.55	0.28	0.14	0.08	0.04
8	2.04	0.87	0.33	0.14	0.10	0.04
9	1.70	0.65	0.30	0.12	0.11	0.04
10	1.65	0.57	0.40	0.14	0.17	0.06
11	1.47	0.46	0.36	0.11	0.34	0.11
12	1.51	0.43	0.35	0.10	0.34	0.10
13	1.43	0.38	0.27	0.07	0.32	0.08
14	1.56	0.38	0.00	0.00	0.32	0.08
15	1.46	0.33	0.00	0.00	0.33	0.08
16	1.40	0.30	0.00	0.00	0.36	0.08
17	1.48	0.30	0.00	0.00	0.58	0.12
18	1.52	0.29	0.00	0.00	0.85	0.16
19	1.69	0.31	0.00	0.00	0.82	0.15
20	1.83	0.32	0.00	0.00	0.98	0.17
21	1.62	0.27	0.00	0.00	0.63	0.10
22	1.52	0.24	0.00	0.00	0.37	0.06

TABLE 34 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670†12†23

SAMPLE NO. 53

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.46	0.22	0.00	0.00	0.46	0.07
24	1.32	0.19	0.00	0.00	0.45	0.07
25	1.14	0.16	0.00	0.00	0.32	0.04
26	0.85	0.11	0.00	0.00	0.22	0.03
27	0.69	0.09	0.00	0.00	0.15	0.02
28	0.56	0.07	0.00	0.00	0.00	0.00
29	0.36	0.04	0.00	0.00	0.00	0.00
30	0.14	0.02	0.00	0.00	0.00	0.00
31	0.03	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 35

SLURRY SCREENING SUMMARY

8870-60-25

16.4 wt. $(70.1g)Co_2(CO)_8/Zr(OPr)_4/HgO-3.6SiO_2$

Sample No.	Time on Stream h	P psig	T °C	SV, NL/g cat/hr	%CO+H_2	%CO	%H_2	Feed CO/H_2	Usage $\Delta CO/\Delta H_2$	Bulk Activity mol syngas/kg cat/h	Specific Activity Mol CO/mol Metal/min	Selectivity Wt%						
												C_1	C_2-C_4	C_5-C_{11}	C_{12}-C_{18}	C_{19}-C_{23}	C_{24}^+	C_5-C_{23}
5	22	301	240	2.0	24.4	15.1	33.7	1.0	0.45	21.8	0.138	10.5	19.4	28.9	24.8	8.3	8.1	62.0
6	70	300	240	2.0	17.4	9.4	29.4	1.5	0.48	15.5	0.103	12.9	23.6	31.8	25.0	4.7	2.0	61.5
9	142	296	244	2.0	17.4	8.2	36.0	2.0	0.46	15.5	0.101	12.9	24.2	41.0	14.7	5.2	2.0	60.9
12	165	297	241	1.0	25.1	13.1	49.5	2.0	0.94	11.2	0.080	11.2	22.7	34.9	16.0	8.0	7.2	58.9
15	190	300	239	1.0	35.4	25.3	45.6	1.0	0.56	15.8	0.116	15.0	23.7	34.1	15.6	6.2	5.4	55.9
18	217	300	241	1.0	29.0	16.5	47.7	1.5	0.52	12.9	0.091	12.2	21.3	34.8	18.2	7.0	6.5	60.0
21	236	302	241	2.0	22.8	13.0	37.6	1.5	0.52	20.4	0.143	19.1	27.2	34.5	12.0	4.2	3.0	50.7
27	260	300	240	2.0	16.4	10.9	27.8	2.0	0.79	14.7	0.133	14.6	33.4	31.5	12.0	5.2	3.3	48.7
30	308	300	240	2.0	18.0	9.2	35.8	2.0	0.52	16.0	0.112	17.8	27.4	33.9	14.3	4.9	1.7	53.1
35	404	300	240	1.0	28.2	16.2	52.5	2.0	0.63	12.6	0.099	16.8	26.2	38.6	11.4	3.6	3.4	53.6
38	453	300	241	1.0	32.8	19.9	52.3	1.5	0.57	14.7	0.109	20.3	27.8	36.2	10.9	2.9	1.9	50.0
40	474	300	240	1.0	39.0	30.7	47.4	1.0	0.65	17.4	0.140	14.7	17.0	29.9	12.5	13.2	12.7	55.6
43	527	300	241	2.0	12.1	6.8	17.6	1.0	0.39	10.8	0.082	14.1	26.2	39.1	21.1	4.8	1.7	65.0

TABLE 36

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/FLORISIL
SAMPLE No: 8670+60+25+3

REACTOR LOADING, MLS :	450.0	T, C :	240.0	FEED RATIO,	
CATALYST LOADING, WT%:	19.7	P, PSIG :	301	CO/H2:	1.00
TIME ON STREAM, HRS :	21.8	SV, L/G/HR:	2.00		

USAGE RATIO, CO/H2 :	0.45	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	24.39	MOL SYNGAS/KG CAT/HR:	21.767
%CO CONV. :	15.07	SPECIFIC ACTIVITY,	
%H2 CONV. :	33.71	MOL CO/MOL METAL/MIN:	0.138

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	5.62	H2O:	10.02
OXYGENATES :	0.22	CO :	78.87
CO2 :	0.89	H2 :	4.39

HYDROCARBON SELECTIVITY, WT%:

C1 :	10.45	C4+ENE :	5.09
C2+ANE :	2.54	C5+C11 :	28.89
C2+ENE :	0.32	C12+C18:	24.75
C3+ANE :	2.62	C19+C23:	8.34
C3+ENE :	5.40	C24+34 :	6.78
C4 ISO+ANE:	3.46	C35+ :	1.36

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	28.89
DIESEL (C9+C25) :	45.25

% ELEMENTAL RECOVERY:

CARBON :	97.62
HYDROGEN:	97.44
OXYGEN :	103.08

TABLE 37

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 3

CARBON NO.	n-ALKANES WT %	n-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	10.45	42.12	0.00	0.00	0.00	0.00
2	2.54	5.46	0.32	0.75	0.00	0.00
3	2.62	3.84	5.40	8.28	0.00	0.00
4	3.32	3.70	5.09	5.86	0.13	0.15
5	3.53	3.16	4.09	3.76	0.33	0.30
6	3.92	2.94	0.42	0.32	0.00	0.00
7	3.08	1.99	0.24	0.16	0.09	0.06
8	2.43	1.38	0.40	0.23	0.17	0.09
9	2.60	1.31	0.30	0.16	0.16	0.08
10	2.88	1.31	0.39	0.18	0.27	0.12
11	2.60	1.07	0.43	0.18	0.55	0.23
12	3.20	1.21	0.00	0.00	0.32	0.12
13	3.13	1.10	0.00	0.00	0.40	0.14
14	3.12	1.02	0.00	0.00	0.44	0.14
15	3.17	0.96	0.00	0.00	0.39	0.12
16	3.33	0.95	0.00	0.00	0.42	0.12
17	3.24	0.87	0.00	0.00	0.51	0.14
18	2.59	0.66	0.00	0.00	0.49	0.12
19	2.12	0.51	0.00	0.00	0.17	0.04
20	1.77	0.41	0.00	0.00	0.09	0.02
21	1.52	0.33	0.00	0.00	0.07	0.02
22	1.31	0.27	0.00	0.00	0.08	0.02

TABLE 37 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670†60†25

SAMPLE NO. 3

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.13	0.23	0.00	0.00	0.09	0.02
24	0.98	0.19	0.00	0.00	0.04	0.01
25	0.94	0.17	0.00	0.00	0.00	0.00
26	0.87	0.15	0.00	0.00	0.00	0.00
27	0.76	0.13	0.00	0.00	0.00	0.00
28	0.77	0.13	0.00	0.00	0.00	0.00
29	0.26	0.04	0.00	0.00	0.06	0.01
30	0.32	0.05	0.00	0.00	0.15	0.02
31	0.37	0.06	0.00	0.00	0.10	0.01
32	0.17	0.02	0.00	0.00	0.12	0.02
33	0.26	0.04	0.00	0.00	0.09	0.01
34	0.36	0.05	0.00	0.00	0.15	0.02
35	0.44	0.06	0.00	0.00	0.04	0.01
36	0.38	0.05	0.00	0.00	0.00	0.00
37	0.23	0.03	0.00	0.00	0.00	0.00
38	0.10	0.01	0.00	0.00	0.00	0.00
39	0.12	0.01	0.00	0.00	0.00	0.00
40	0.05	0.01	0.00	0.00	0.00	0.00

TABLE 38

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/ZR/FLORISIL
SAMPLE No: 8670+60+25+6

REACTOR LOADING, MLS :	450.0	T, C :	239.8	FEED RATIO,	
CATALYST LOADING, WT%:	19.7	P, PSIG :	300	CO/H2:	1.50
TIME ON STREAM, HRS :	69.8	SV, L/G/HR:	2.00		

USAGE RATIO, CO/H2 :	0.48	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	17.37	MOL SYNGAS/KG CAT/HR:	15.500
%CO CONV. :	9.35	SPECIFIC ACTIVITY,	
%H2 CONV. :	29.42	MOL CO/MOL METAL/MIN:	0.103

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	3.38	H2O:	5.68
OXYGENATES :	0.17	CO :	86.99
CO2 :	0.57	H2 :	3.22

HYDROCARBON SELECTIVITY, WT%:

C1 :	12.87	C4+ENE :	6.46
C2+ANE :	2.85	C5+C11 :	31.81
C2+ENE :	0.68	C12+C18:	25.04
C3+ANE :	2.37	C19+C23:	4.69
C3+ENE :	7.98	C24+34 :	1.74
C4 ISO+ANE:	3.24	C35+ :	0.29

FUEL FRACTIONS, WT%

GASOLINE (C5+C11):	31.81
DIESEL (C9+C25) :	42.48

% ELEMENTAL RECOVERY:

CARBON :	98.09
HYDROGEN:	97.24
OXYGEN :	100.72

TABLE 39

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 6

CARBON NO.	N+ALKANES		1+ALKENE		BRANCHED ISOMERS	
	WT %	MOLE %	WT %	MOLE %	WT %	MOLE %
1	12.87	44.65	0.00	0.00	0.00	0.00
2	2.85	5.27	0.68	1.34	0.00	0.00
3	2.37	2.99	7.98	10.55	0.00	0.00
4	3.14	3.01	6.46	6.40	0.10	0.10
5	2.87	2.21	4.97	3.94	0.29	0.23
6	4.51	2.91	0.00	0.00	0.00	0.00
7	2.86	1.59	0.65	0.37	0.10	0.06
8	2.34	1.14	0.61	0.30	0.35	0.17
9	2.55	1.11	0.59	0.26	0.17	0.07
10	3.07	1.20	0.87	0.34	0.43	0.17
11	2.96	1.05	0.81	0.29	0.78	0.28
12	2.88	0.94	0.85	0.28	0.54	0.18
13	3.51	1.06	0.00	0.00	0.56	0.17
14	3.25	0.91	0.00	0.00	0.55	0.15
15	2.99	0.78	0.00	0.00	0.52	0.14
16	2.83	0.70	0.00	0.00	0.48	0.12
17	2.68	0.62	0.00	0.00	0.49	0.11
18	2.46	0.54	0.00	0.00	0.44	0.10
19	1.81	0.38	0.00	0.00	0.37	0.08
20	1.05	0.21	0.00	0.00	0.21	0.04
21	0.53	0.10	0.00	0.00	0.04	0.01
22	0.36	0.07	0.00	0.00	0.02	0.00

TABLE 39 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO- 8670+60+25

SAMPLE NO- 6

CARBON NO-	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.28	0.05	0.00	0.00	0.02	0.00
24	0.25	0.04	0.00	0.00	0.01	0.00
25	0.24	0.04	0.00	0.00	0.01	0.00
26	0.21	0.03	0.00	0.00	0.00	0.00
27	0.19	0.03	0.00	0.00	0.00	0.00
28	0.17	0.02	0.00	0.00	0.00	0.00
29	0.14	0.02	0.00	0.00	0.01	0.00
30	0.10	0.01	0.00	0.00	0.02	0.00
31	0.10	0.01	0.00	0.00	0.01	0.00
32	0.07	0.01	0.00	0.00	0.02	0.00
33	0.07	0.01	0.00	0.00	0.01	0.00
34	0.09	0.01	0.00	0.00	0.02	0.00
35	0.08	0.01	0.00	0.00	0.00	0.00
36	0.07	0.01	0.00	0.00	0.00	0.00
37	0.05	0.01	0.00	0.00	0.00	0.00
38	0.03	0.00	0.00	0.00	0.00	0.00
39	0.03	0.00	0.00	0.00	0.00	0.00
40	0.02	0.00	0.00	0.00	0.00	0.00

TABLE 40

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/FLORISIL
SAMPLE No: 8670+60+25+9

REACTOR LOADING, MLS :	450.0	T, C :	244.0	FEED RATIO,	
CATALYST LOADING, WT%:	19.7	P, PSIG :	298	CO/H2:	2.03
TIME ON STREAM, HRS :	142.1	SV, L/G/HR:	2.00		

USAGE RATIO, CO/H2 :	0.46	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	17.38	MOL SYNGAS/KG CAT/HR:	15.510
%CO CONV. :	8.22	SPECIFIC ACTIVITY,	
%H2 CONV. :	35.97	MOL CO/MOL METAL/MIN:	0.101

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	3.04	H2O:	5.53
OXYGENATES :	0.15	CO :	88.48
CO2 :	0.63	H2 :	2.17

HYDROCARBON SELECTIVITY, WT%:

C1 :	12.89	C4+ENE :	7.20
C2+ANE :	2.56	C5+C11 :	41.05
C2+ENE :	0.83	C12+C18:	14.67
C3+ANE :	2.00	C19+C23:	5.19
C3+ENE :	8.89	C24+34 :	1.75
C4 ISO+ANE:	2.69	C35+ :	0.29

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	41.05
DIESEL (C9+C25) :	36.48

% ELEMENTAL RECOVERY:

CARBON :	98.54
HYDROGEN:	97.50
OXYGEN :	101.62

TABLE 41

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 9

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	12.89	43.33	0.00	0.00	0.00	0.00
2	2.56	4.60	0.83	1.59	0.00	0.00
3	2.00	2.44	8.89	11.39	0.00	0.00
4	2.58	2.40	7.20	6.91	0.11	0.10
5	2.84	2.13	6.51	5.01	0.31	0.23
6	3.47	2.17	1.84	1.18	0.13	0.08
7	1.82	0.98	2.32	1.27	1.23	0.66
8	2.91	1.37	1.54	0.74	0.00	0.00
9	2.81	1.18	1.27	0.54	2.02	0.85
10	3.04	1.15	1.35	0.52	1.62	0.61
11	2.03	0.70	0.91	0.32	1.08	0.37
12	1.88	0.60	0.72	0.23	0.79	0.25
13	1.54	0.45	0.54	0.16	0.27	0.08
14	1.33	0.36	0.49	0.13	0.15	0.04
15	1.61	0.41	0.00	0.00	0.12	0.03
16	1.59	0.38	0.00	0.00	0.07	0.02
17	1.61	0.36	0.00	0.00	0.07	0.02
18	1.76	0.37	0.00	0.00	0.13	0.03
19	1.64	0.33	0.00	0.00	0.28	0.06
20	1.33	0.25	0.00	0.00	0.28	0.05
21	0.76	0.14	0.00	0.00	0.16	0.03
22	0.40	0.07	0.00	0.00	0.03	0.00

TABLE 41 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 9

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.28	0.05	0.00	0.00	0.02	0.00
24	0.25	0.04	0.00	0.00	0.01	0.00
25	0.24	0.04	0.00	0.00	0.01	0.00
26	0.22	0.03	0.00	0.00	0.00	0.00
27	0.20	0.03	0.00	0.00	0.00	0.00
28	0.17	0.02	0.00	0.00	0.00	0.00
29	0.14	0.02	0.00	0.00	0.01	0.00
30	0.10	0.01	0.00	0.00	0.02	0.00
31	0.10	0.01	0.00	0.00	0.01	0.00
32	0.07	0.01	0.00	0.00	0.02	0.00
33	0.07	0.01	0.00	0.00	0.01	0.00
34	0.09	0.01	0.00	0.00	0.02	0.00
35	0.08	0.01	0.00	0.00	0.00	0.00
36	0.07	0.01	0.00	0.00	0.00	0.00
37	0.05	0.00	0.00	0.00	0.00	0.00
38	0.03	0.00	0.00	0.00	0.00	0.00
39	0.03	0.00	0.00	0.00	0.00	0.00
40	0.02	0.00	0.00	0.00	0.00	0.00

TABLE 42

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/FLORISIL
SAMPLE No: 8670+60+25+12

REACTOR LOADING, MLS :	450.0	T, C :	240.7	FEED RATIO,	
CATALYST LOADING, WT%:	19.7	P, PSIG :	297	CO/H2:	2.03
TIME ON STREAM, HRS :	164.6	SV, L/G/HR:	1.00		

USAGE RATIO, CO/H2 :	0.54	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	25.09	MOL SYNGAS/KG CAT/HR:	11.216
%CO CONV. :	13.07	SPECIFIC ACTIVITY,	
%H2 CONV. :	49.52	MOL CO/MOL METAL/MIN:	0.080

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	4.91	H20:	7.09
OXYGENATES :	0.19	CO :	84.67
CO2 :	1.41	H2 :	1.73

HYDROCARBON SELECTIVITY, WT%:

C1 :	11.19	C4+ENE :	7.14
C2+ANE :	2.30	C5+C11 :	34.92
C2+ENE :	0.59	C12+C18:	15.97
C3+ANE :	1.84	C19+C23:	8.04
C3+ENE :	8.39	C24+34 :	6.03
C4 ISO+ANE:	2.46	C35+ :	1.12

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	34.92
DIESEL (C9+C25) :	38.83

% ELEMENTAL RECOVERY:

CARBON :	97.94
HYDROGEN:	97.69
OXYGEN :	100.20

TABLE 43

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 12

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	11.19	41.33	0.00	0.00	0.00	0.00
2	2.30	4.53	0.59	1.25	0.00	0.00
3	1.84	2.48	8.39	11.81	0.00	0.00
4	2.38	2.42	7.14	7.53	0.08	0.08
5	2.64	2.17	7.46	6.30	0.30	0.24
6	4.42	3.04	0.00	0.00	0.00	0.00
7	2.53	1.49	0.70	0.42	0.46	0.27
8	2.05	1.06	0.62	0.33	0.94	0.49
9	2.20	1.01	0.75	0.35	1.21	0.56
10	3.29	1.37	1.14	0.48	0.59	0.25
11	2.36	0.90	0.79	0.30	0.47	0.18
12	2.29	0.80	0.54	0.19	0.51	0.18
13	2.04	0.66	0.41	0.13	0.27	0.09
14	1.83	0.54	0.31	0.09	0.24	0.07
15	1.58	0.44	0.23	0.06	0.24	0.07
16	1.48	0.39	0.17	0.04	0.21	0.05
17	1.47	0.36	0.00	0.00	0.29	0.07
18	1.68	0.39	0.00	0.00	0.19	0.04
19	1.55	0.34	0.00	0.00	0.30	0.07
20	1.66	0.35	0.00	0.00	0.19	0.04
21	1.53	0.31	0.00	0.00	0.15	0.03
22	1.30	0.25	0.00	0.00	0.10	0.02

TABLE 43 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670†60†25

SAMPLE NO. 12

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.15	0.21	0.00	0.00	0.08	0.01
24	1.00	0.18	0.00	0.00	0.06	0.01
25	0.92	0.15	0.00	0.00	0.03	0.01
26	0.84	0.14	0.00	0.00	0.00	0.00
27	0.68	0.11	0.00	0.00	0.00	0.00
28	0.45	0.07	0.00	0.00	0.03	0.00
29	0.34	0.05	0.00	0.00	0.02	0.00
30	0.32	0.04	0.00	0.00	0.04	0.01
31	0.32	0.04	0.00	0.00	0.03	0.00
32	0.25	0.03	0.00	0.00	0.03	0.00
33	0.25	0.03	0.00	0.00	0.03	0.00
34	0.33	0.04	0.00	0.00	0.05	0.01
35	0.33	0.04	0.00	0.00	0.00	0.00
36	0.28	0.03	0.00	0.00	0.00	0.00
37	0.20	0.02	0.00	0.00	0.00	0.00
38	0.13	0.01	0.00	0.00	0.00	0.00
39	0.12	0.01	0.00	0.00	0.00	0.00
40	0.06	0.01	0.00	0.00	0.00	0.00

TABLE 44

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/FLORISIL
SAMPLE NO: 8670+60+25+15

REACTOR LOADING, MLS :	450.0	T, C :	239.4	FEED RATIO,	
CATALYST LOADING, WT%:	19.7	P, PSIG :	300	CO/H2:	1.00
TIME ON STREAM, HRS :	189.9	SV, L/G/HR:	1.00		

USAGE RATIO, CO/H2 :	0.56	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	35.41	MOL SYNGAS/KG CAT/HR:	15.820
%CO CONV. :	25.29	SPECIFIC ACTIVITY,	
%H2 CONV. :	45.56	MOL CO/MOL METAL/MIN:	0.116

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	8.59	H20:	12.80
OXYGENATES :	0.46	CO :	72.48
CO2 :	1.91	H2 :	3.76

HYDROCARBON SELECTIVITY, WT%:

C1 :	14.97	C4+ENE :	5.69
C2+ANE :	3.61	C5+C11 :	34.09
C2+ENE :	0.31	C12+C18:	15.62
C3+ANE :	3.57	C19+C23:	6.17
C3+ENE :	6.70	C24+34 :	4.73
C4 ISO+ANE:	3.85	C35+ :	0.70

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	34.09
DIESEL (C9+C25) :	36.93

% ELEMENTAL RECOVERY:

CARBON :	93.71
HYDROGEN:	96.90
OXYGEN :	98.02

TABLE 45

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 15

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	14.97	48.46	0.00	0.00	0.00	0.00
2	3.61	6.23	0.31	0.58	0.00	0.00
3	3.57	4.20	6.70	8.27	0.00	0.00
4	3.73	3.33	5.69	5.27	0.11	0.10
5	3.63	2.61	5.29	3.91	0.29	0.21
6	3.75	2.26	0.25	0.15	0.00	0.00
7	2.40	1.24	0.38	0.20	0.72	0.37
8	2.28	1.04	0.39	0.18	1.01	0.46
9	3.40	1.37	1.15	0.47	0.13	0.05
10	3.69	1.35	1.08	0.40	0.39	0.14
11	2.82	0.94	0.74	0.25	0.30	0.10
12	2.51	0.77	0.62	0.19	0.05	0.02
13	2.29	0.65	0.42	0.12	0.15	0.04
14	2.06	0.54	0.33	0.09	0.12	0.03
15	1.83	0.45	0.26	0.06	0.11	0.03
16	1.51	0.35	0.19	0.04	0.09	0.02
17	1.36	0.29	0.14	0.03	0.07	0.02
18	1.30	0.26	0.15	0.03	0.05	0.01
19	1.26	0.24	0.10	0.02	0.11	0.02
20	1.42	0.26	0.00	0.00	0.07	0.01
21	1.19	0.21	0.00	0.00	0.02	0.00
22	1.09	0.18	0.00	0.00	0.00	0.00

TABLE 45 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 15

CARBON NO.	N‡ALKANES WT %	N‡ALKANES MOLE %	1‡ALKENE WT %	1‡ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.89	0.14	0.00	0.00	0.00	0.00
24	0.77	0.12	0.00	0.00	0.00	0.00
25	0.67	0.10	0.00	0.00	0.00	0.00
26	0.60	0.08	0.00	0.00	0.00	0.00
27	0.55	0.07	0.00	0.00	0.00	0.00
28	0.45	0.06	0.00	0.00	0.00	0.00
29	0.37	0.05	0.00	0.00	0.00	0.00
30	0.32	0.04	0.00	0.00	0.00	0.00
31	0.30	0.04	0.00	0.00	0.00	0.00
32	0.26	0.03	0.00	0.00	0.00	0.00
33	0.22	0.03	0.00	0.00	0.00	0.00
34	0.23	0.03	0.00	0.00	0.00	0.00
35	0.21	0.02	0.00	0.00	0.00	0.00
36	0.25	0.03	0.00	0.00	0.00	0.00
37	0.10	0.01	0.00	0.00	0.00	0.00
38	0.09	0.01	0.00	0.00	0.00	0.00
39	0.06	0.01	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 46

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/FLORISIL
SAMPLE No: 8670+60+25+18

REACTOR LOADING, MLS :	450.0	T, C :	241.0	FEED RATIO,	
CATALYST LOADING, WT%:	19.7	P, PSIG :	300	CO/H2:	1.50
TIME ON STREAM, HRS :	211.8	SV, L/G/HR:	1.00		

USAGE RATIO, CO/H2 :	0.52	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	28.95	MOL SYNGAS/KG CAT/HR:	12.930
%CO CONV. :	16.50	SPECIFIC ACTIVITY,	
%H2 CONV. :	47.67	MOL CO/MOL METAL/MIN:	0.091

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	6.56	H2O:	9.43
OXYGENATES :	0.32	CO :	79.47
CO2 :	1.85	H2 :	2.36

HYDROCARBON SELECTIVITY, WT%:

C1 :	12.15	C4+ENE :	5.98
C2+ANE :	2.72	C5+C11 :	34.77
C2+ENE :	0.42	C12+C18:	18.21
C3+ANE :	2.35	C19+C23:	7.05
C3+ENE :	7.05	C24+34 :	5.50
C4 ISO+ANE:	2.80	C35+ :	1.00

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	34.77
DIESEL (C9+C25) :	40.62

% ELEMENTAL RECOVERY:

CARBON :	98.59
HYDROGEN:	100.47
OXYGEN :	101.60

TABLE 47

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 18

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	12.15	44.23	0.00	0.00	0.00	0.00
2	2.72	5.29	0.42	0.86	0.00	0.00
3	2.35	3.11	7.05	9.78	0.00	0.00
4	2.70	2.71	5.98	6.22	0.10	0.10
5	2.74	2.21	4.65	3.87	0.27	0.22
6	5.55	3.76	0.27	0.19	0.00	0.00
7	2.72	1.59	0.64	0.38	0.68	0.40
8	2.18	1.11	0.54	0.28	0.97	0.49
9	3.19	1.45	1.03	0.48	0.14	0.06
10	3.54	1.45	1.06	0.44	0.59	0.24
11	2.94	1.10	0.71	0.27	0.39	0.14
12	2.66	0.91	0.60	0.21	0.05	0.02
13	2.45	0.78	0.41	0.13	0.15	0.05
14	2.27	0.67	0.33	0.10	0.17	0.05
15	2.13	0.59	0.26	0.07	0.16	0.04
16	1.97	0.51	0.20	0.05	0.22	0.06
17	1.77	0.43	0.15	0.04	0.27	0.06
18	1.58	0.36	0.00	0.00	0.42	0.10
19	1.53	0.33	0.00	0.00	0.19	0.04
20	1.48	0.31	0.00	0.00	0.10	0.02
21	1.32	0.26	0.00	0.00	0.08	0.02
22	1.12	0.21	0.00	0.00	0.11	0.02

TABLE 47 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670†60†25

SAMPLE NO. 18

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.03	0.18	0.00	0.00	0.09	0.02
24	0.90	0.15	0.00	0.00	0.07	0.01
25	0.77	0.13	0.00	0.00	0.04	0.01
26	0.69	0.11	0.00	0.00	0.02	0.00
27	0.66	0.10	0.00	0.00	0.00	0.00
28	0.42	0.06	0.00	0.00	0.03	0.00
29	0.34	0.05	0.00	0.00	0.02	0.00
30	0.32	0.04	0.00	0.00	0.02	0.00
31	0.28	0.04	0.00	0.00	0.02	0.00
32	0.25	0.03	0.00	0.00	0.04	0.00
33	0.24	0.03	0.00	0.00	0.02	0.00
34	0.31	0.04	0.00	0.00	0.05	0.01
35	0.29	0.03	0.00	0.00	0.00	0.00
36	0.26	0.03	0.00	0.00	0.00	0.00
37	0.18	0.02	0.00	0.00	0.00	0.00
38	0.11	0.01	0.00	0.00	0.00	0.00
39	0.10	0.01	0.00	0.00	0.00	0.00
40	0.06	0.01	0.00	0.00	0.00	0.00

TABLE 48

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/FLORISIL
SAMPLE NO: 8670+60+25+24

REACTOR LOADING, MLS :	450.0	T, C :	260.7	FEED RATIO,	
CATALYST LOADING, WT%:	19.7	P, PSIG :	302	CO/H2:	1.50
TIME ON STREAM, HRS :	236.1	SV, L/G/HR:	2.00		

USAGE RATIO, CO/H2 :	0.52	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	22.84	MOL SYNGAS/KG CAT/HR:	20.385
%CO CONV. :	13.00	SPECIFIC ACTIVITY,	
%H2 CONV. :	37.63	MOL CO/MOL METAL/MIN:	0.143

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	5.20	H2O:	7.78
OXYGENATES :	0.35	CO :	82.29
CO2 :	1.58	H2 :	2.80

HYDROCARBON SELECTIVITY, WT%:

C1 :	19.04	C4+ENE :	6.89
C2+ANE :	4.37	C5+C11 :	34.52
C2+ENE :	0.50	C12+C18:	12.00
C3+ANE :	3.45	C19+C23:	4.20
C3+ENE :	8.44	C24+34 :	2.60
C4 ISO+ANE:	3.55	C35+ :	0.44

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	34.52
DIESEL (C9+C25) :	26.38

% ELEMENTAL RECOVERY:

CARBON :	99.12
HYDROGEN:	102.76
OXYGEN :	102.14

TABLE 49

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 24

CARBON NO.	n-ALKANES WT %	n-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	19.04	52.61	0.00	0.00	0.00	0.00
2	4.37	6.44	0.50	0.78	0.00	0.00
3	3.45	3.47	8.44	8.88	0.00	0.00
4	3.45	2.63	6.89	5.44	0.10	0.08
5	3.51	2.15	5.21	3.29	0.36	0.22
6	7.41	3.81	0.19	0.10	0.00	0.00
7	3.38	1.49	0.81	0.36	0.65	0.29
8	2.30	0.89	0.60	0.24	0.75	0.29
9	1.93	0.67	0.52	0.18	0.85	0.29
10	1.91	0.59	0.46	0.15	0.82	0.26
11	1.66	0.47	0.42	0.12	0.77	0.22
12	1.45	0.38	0.38	0.10	0.50	0.13
13	1.56	0.37	0.12	0.03	0.28	0.07
14	1.35	0.30	0.08	0.02	0.25	0.05
15	1.21	0.25	0.04	0.01	0.22	0.05
16	1.17	0.23	0.11	0.02	0.13	0.03
17	1.22	0.22	0.16	0.03	0.12	0.02
18	1.30	0.23	0.02	0.00	0.34	0.06
19	1.12	0.18	0.00	0.00	0.25	0.04
20	0.84	0.13	0.00	0.00	0.14	0.02
21	0.66	0.10	0.00	0.00	0.08	0.01
22	0.55	0.08	0.00	0.00	0.06	0.01

TABLE 49 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 24

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.46	0.06	0.00	0.00	0.05	0.01
24	0.40	0.05	0.00	0.00	0.04	0.01
25	0.35	0.04	0.00	0.00	0.04	0.00
26	0.30	0.04	0.00	0.00	0.03	0.00
27	0.25	0.03	0.00	0.00	0.02	0.00
28	0.22	0.02	0.00	0.00	0.02	0.00
29	0.18	0.02	0.00	0.00	0.02	0.00
30	0.16	0.02	0.00	0.00	0.02	0.00
31	0.14	0.01	0.00	0.00	0.02	0.00
32	0.12	0.01	0.00	0.00	0.01	0.00
33	0.11	0.01	0.00	0.00	0.01	0.00
34	0.13	0.01	0.00	0.00	0.01	0.00
35	0.12	0.01	0.00	0.00	0.00	0.00
36	0.10	0.01	0.00	0.00	0.00	0.00
37	0.08	0.01	0.00	0.00	0.00	0.00
38	0.06	0.00	0.00	0.00	0.00	0.00
39	0.05	0.00	0.00	0.00	0.00	0.00
40	0.03	0.00	0.00	0.00	0.00	0.00

TABLE 50

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/FLORISIL
SAMPLE No: 8670+60+25+27

REACTOR LOADING, MLS :	450.0	T, C :	259.9	FEED RATIO,	
CATALYST LOADING, WT%:	19.7	P, PSIG :	300	CO/H2:	2.03
TIME ON STREAM, HRS :	260.4	SV, L/G/HR:	2.00		

USAGE RATIO, CO/H2 :	0.79	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	16.45	MOL SYNGAS/KG CAT/HR:	14.670
%CO CONV- :	10.86	SPECIFIC ACTIVITY,	
%H2 CONV- :	27.78	MOL CO/MOL METAL/MIN:	0.133

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	4.00	H20:	6.06
OXYGENATES :	0.30	CO :	85.98
CO2 :	1.21	H2 :	2.45

HYDROCARBON SELECTIVITY, WT%:

C1 :	14.60	C4+ENE :	16.41
C2+ANE :	3.30	C5+C11 :	31.48
C2+ENE :	0.66	C12+C18:	12.07
C3+ANE :	2.11	C19+C23:	5.20
C3+ENE :	8.30	C24+34 :	2.80
C4 ISO+ANE:	2.61	C35+ :	0.47

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	31.48
DIESEL (C9+C25) :	27.44

% ELEMENTAL RECOVERY:

CARBON :	98.42
HYDROGEN:	112.86
OXYGEN :	100.68

TABLE 51

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 27

CARBON NO.	N+ALKANES		1+ALKENE		BRANCHED ISOMERS	
	WT %	MOLE %	WT %	MOLE %	WT %	MOLE %
1	14.60	44.59	0.00	0.00	0.00	0.00
2	3.30	5.38	0.66	1.15	0.00	0.00
3	2.11	2.34	8.30	9.66	0.00	0.00
4	2.52	2.12	16.41	14.32	0.09	0.07
5	2.85	1.94	6.15	4.29	0.28	0.19
6	5.08	2.89	0.14	0.08	0.00	0.00
7	2.70	1.32	0.81	0.41	0.65	0.32
8	2.19	0.94	0.75	0.33	0.64	0.27
9	1.78	0.68	0.69	0.27	0.83	0.32
10	0.99	0.34	1.06	0.37	0.41	0.14
11	1.28	0.40	0.43	0.14	1.77	0.56
12	1.21	0.35	0.41	0.12	0.64	0.18
13	1.46	0.39	0.33	0.09	0.24	0.07
14	1.29	0.32	0.26	0.06	0.21	0.05
15	1.15	0.26	0.14	0.03	0.25	0.06
16	1.04	0.23	0.16	0.04	0.17	0.04
17	1.07	0.22	0.07	0.02	0.27	0.05
18	1.28	0.25	0.00	0.00	0.43	0.08
19	1.32	0.24	0.00	0.00	0.42	0.08
20	1.04	0.18	0.00	0.00	0.24	0.04
21	0.79	0.13	0.00	0.00	0.10	0.02
22	0.61	0.10	0.00	0.00	0.07	0.01

TABLE 51 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 27

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.53	0.08	0.00	0.00	0.09	0.01
24	0.45	0.06	0.00	0.00	0.05	0.01
25	0.38	0.05	0.00	0.00	0.04	0.01
26	0.32	0.04	0.00	0.00	0.03	0.00
27	0.27	0.03	0.00	0.00	0.03	0.00
28	0.23	0.03	0.00	0.00	0.02	0.00
29	0.19	0.02	0.00	0.00	0.02	0.00
30	0.17	0.02	0.00	0.00	0.02	0.00
31	0.15	0.02	0.00	0.00	0.02	0.00
32	0.12	0.01	0.00	0.00	0.01	0.00
33	0.12	0.01	0.00	0.00	0.01	0.00
34	0.14	0.01	0.00	0.00	0.01	0.00
35	0.13	0.01	0.00	0.00	0.00	0.00
36	0.10	0.01	0.00	0.00	0.00	0.00
37	0.08	0.01	0.00	0.00	0.00	0.00
38	0.06	0.01	0.00	0.00	0.00	0.00
39	0.05	0.00	0.00	0.00	0.00	0.00
40	0.04	0.00	0.00	0.00	0.00	0.00

Table 52

Mass Balance
Process Conditions and Product Summary

Catalyst : Co/Zr/Florisil
Sample No: 8670+60+25+30

Reactor Loading, mls :	450.0	T, C :	259.8	Feed Ratio, CO/H2:	2.03
Catalyst Loading, wt%:	19.7	P, psig :	300		
Time on Stream, hrs :	308.4	SV, L/g/hr:	2.00		

Usage Ratio, CO/H2 :	0.52	Bulk Activity, mol syngas/kg cat/hr:	16.037
%Overall Conv., CO+H2:	17.98	Specific Activity, mol CO/mol metal/min:	0.112
%CO Conv. :	9.17		
%H2 Conv. :	35.84		

Weight % Product Distribution:

Hydrocarbons:	3.81	H2O:	5.13
Oxygenates :	0.20	CO :	87.39
CO2 :	1.31	H2 :	2.17

Hydrocarbon Selectivity, wt%:

C1 :	17.78	C4+ene :	7.89
C2+ane :	3.81	C5+C11 :	33.85
C2+ene :	0.71	C12+C18:	14.32
C3+ane :	2.48	C19+C23:	4.93
C3+ene :	9.64	C24+34 :	1.50
C4 iso+ane:	2.86	C35+ :	0.22

Fuel Fractions, wt%:

Gasoline (C5+C11):	33.85
Diesel (C9+C25) :	30.89

% Elemental Recovery:

Carbon :	99.59
Hydrogen:	100.97
Oxygen :	100.97

TABLE 53

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 30

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	17.78	50.93	0.00	0.00	0.00	0.00
2	3.81	5.81	0.71	1.17	0.00	0.00
3	2.48	2.58	9.64	10.52	0.00	0.00
4	2.75	2.18	7.89	6.46	0.10	0.08
5	2.78	1.77	6.21	4.07	0.30	0.19
6	4.83	2.57	0.49	0.27	0.00	0.00
7	2.31	1.06	0.57	0.27	1.45	0.66
8	2.16	0.87	0.79	0.32	0.84	0.34
9	1.96	0.70	0.75	0.27	0.92	0.33
10	2.15	0.69	0.87	0.28	1.30	0.42
11	1.49	0.44	0.62	0.18	1.06	0.31
12	1.52	0.41	0.54	0.15	0.97	0.26
13	1.78	0.44	0.00	0.00	0.64	0.16
14	1.56	0.36	0.00	0.00	0.51	0.12
15	1.40	0.30	0.00	0.00	0.43	0.09
16	1.27	0.26	0.00	0.00	0.38	0.08
17	1.19	0.23	0.00	0.00	0.36	0.07
18	1.33	0.24	0.00	0.00	0.43	0.08
19	1.47	0.25	0.00	0.00	0.47	0.08
20	1.08	0.18	0.00	0.0	0.31	0.05
21	0.65	0.10	0.00	0.00	0.11	0.02
22	0.42	0.06	0.00	0.00	0.05	0.01

TABLE 53 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 30

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.32	0.04	0.00	0.00	0.04	0.01
24	0.25	0.03	0.00	0.00	0.03	0.00
25	0.21	0.03	0.00	0.00	0.02	0.00
26	0.17	0.02	0.00	0.00	0.02	0.00
27	0.14	0.02	0.00	0.00	0.01	0.00
28	0.12	0.01	0.00	0.00	0.02	0.00
29	0.10	0.01	0.00	0.00	0.01	0.00
30	0.09	0.01	0.00	0.00	0.01	0.00
31	0.08	0.01	0.00	0.00	0.01	0.00
32	0.06	0.01	0.00	0.00	0.01	0.00
33	0.06	0.01	0.00	0.00	0.01	0.00
34	0.07	0.01	0.00	0.00	0.01	0.00
35	0.06	0.01	0.00	0.00	0.00	0.00
36	0.05	0.00	0.00	0.00	0.00	0.00
37	0.04	0.00	0.00	0.00	0.00	0.00
38	0.03	0.00	0.00	0.00	0.00	0.00
39	0.02	0.00	0.00	0.00	0.00	0.00
40	0.02	0.00	0.00	0.00	0.00	0.00

TABLE 54

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/FLORISIL
SAMPLE NO: 8670+60+25+35

REACTOR LOADING, MLS :	450.0	T, C :	260.3	FEED RATIO,	
CATALYST LOADING, WT%:	19.7	P, PSIG :	300	CO/H2:	2.03
TIME ON STREAM, HRS :	403.6	SV, L/G/HR:	1.00		

USAGE RATIO, CO/H2 :	0.63	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	28.17	MOL SYNGAS/KG CAT/HR:	12.585
%CO CONV. :	16.21	SPECIFIC ACTIVITY,	
%H2 CONV. :	52.47	MOL CO/MOL METAL/MIN:	0.099

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	5.62	H20:	7.19
OXYGENATES :	0.23	CO :	82.30
CO2 :	3.02	H2 :	1.64

HYDROCARBON SELECTIVITY, WT%:

C1 :	16.78	C4+ENE :	7.90
C2+ANE :	3.66	C5+C11 :	38.58
C2+ENE :	0.52	C12+C18:	11.43
C3+ANE :	2.67	C19+C23:	3.63
C3+ENE :	8.78	C24+34 :	2.98
C4 ISO+ANE:	2.68	C35+ :	0.41

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	38.58
DIESEL (C9+C25) :	30.04

% ELEMENTAL RECOVERY:

CARBON :	97.11
HYDROGEN:	99.28
OXYGEN :	99.23

TABLE 55

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 35

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	16.78	49.61	0.00	0.00	0.00	0.00
2	3.66	5.78	0.52	0.87	0.00	0.00
3	2.67	2.87	8.78	9.89	0.00	0.00
4	2.68	2.18	7.90	6.67	0.00	0.00
5	2.97	1.95	6.02	4.07	0.30	0.20
6	4.64	2.55	1.18	0.66	0.00	0.00
7	3.49	1.65	0.65	0.31	0.68	0.32
8	2.82	1.17	0.74	0.31	1.04	0.43
9	2.75	1.02	0.83	0.31	1.39	0.52
10	3.68	1.23	1.19	0.40	0.82	0.27
11	1.71	0.52	0.59	0.18	1.08	0.33
12	1.42	0.40	0.53	0.15	0.61	0.17
13	1.25	0.32	0.41	0.11	0.49	0.13
14	1.42	0.34	0.00	0.00	0.38	0.09
15	1.24	0.28	0.00	0.00	0.28	0.06
16	1.05	0.22	0.00	0.00	0.25	0.05
17	0.88	0.17	0.00	0.00	0.22	0.04
18	0.77	0.14	0.00	0.00	0.18	0.03
19	0.79	0.14	0.00	0.00	0.14	0.03
20	0.71	0.12	0.00	0.00	0.11	0.02
21	0.63	0.10	0.00	0.00	0.07	0.01
22	0.56	0.09	0.00	0.00	0.07	0.01

TABLE 55 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 35

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.50	0.07	0.00	0.00	0.06	0.01
24	0.44	0.06	0.00	0.00	0.05	0.01
25	0.39	0.05	0.00	0.00	0.04	0.01
26	0.34	0.04	0.00	0.00	0.04	0.00
27	0.29	0.04	0.00	0.00	0.03	0.00
28	0.25	0.03	0.00	0.00	0.02	0.00
29	0.21	0.02	0.00	0.00	0.02	0.00
30	0.19	0.02	0.00	0.00	0.02	0.00
31	0.16	0.02	0.00	0.00	0.02	0.00
32	0.14	0.01	0.00	0.00	0.01	0.00
33	0.13	0.01	0.00	0.00	0.01	0.00
34	0.15	0.01	0.00	0.00	0.01	0.00
35	0.13	0.01	0.00	0.00	0.00	0.00
36	0.10	0.01	0.00	0.00	0.00	0.00
37	0.07	0.01	0.00	0.00	0.00	0.00
38	0.05	0.00	0.00	0.00	0.00	0.00
39	0.04	0.00	0.00	0.00	0.00	0.00
40	0.03	0.00	0.00	0.00	0.00	0.00

TABLE 56

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/FLORISIL
SAMPLE No: 8670+60+25+38

REACTOR LOADING, MLS :	450.0	T, C :	260.6	FEED RATIO,	
CATALYST LOADING, WT%:	19.7	P, PSIG :	300	CO/H2:	1.50
TIME ON STREAM, HRS :	453.4	SV, L/G/HR:	1.00		

USAGE RATIO, CO/H2 :	0.57	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	32.84	MOL SYNGAS/KG CAT/HR:	14.660
%CO CONV. :	19.89	SPECIFIC ACTIVITY,	
%H2 CONV. :	52.32	MOL CO/MOL METAL/MIN:	0.109

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	7.41	H2O:	8.57
OXYGENATES :	0.35	CO :	77.45
CO2 :	4.03	H2 :	2.19

HYDROCARBON SELECTIVITY, WT%:

C1 :	20.30	C4+ENE :	7.23
C2+ANE :	4.47	C5+C11 :	36.18
C2+ENE :	0.33	C12+C18:	10.94
C3+ANE :	4.12	C19+C23:	2.89
C3+ENE :	7.80	C24+34 :	1.66
C4 ISO+ANE:	3.85	C35+ :	0.22

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	36.18
DIESEL (C9+C25) :	25.65

% ELEMENTAL RECOVERY:

CARBON :	97.96
HYDROGEN:	97.74
OXYGEN :	99.42

TABLE 57

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 38

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	20.30	53.88	0.00	0.00	0.00	0.00
2	4.47	6.33	0.33	0.50	0.00	0.00
3	4.12	3.98	7.80	7.89	0.00	0.00
4	3.75	2.75	7.23	5.49	0.10	0.07
5	4.12	2.43	6.52	3.96	0.00	0.00
6	5.35	2.64	1.26	0.64	0.00	0.00
7	3.01	1.28	0.65	0.28	0.54	0.23
8	2.06	0.77	0.41	0.16	0.99	0.37
9	2.75	0.91	0.00	0.00	1.22	0.40
10	2.90	0.87	0.00	0.00	1.28	0.38
11	2.18	0.59	0.00	0.00	0.96	0.26
12	1.42	0.35	0.00	0.00	0.96	0.24
13	1.54	0.36	0.00	0.00	0.45	0.10
14	1.35	0.29	0.00	0.00	0.37	0.08
15	1.18	0.24	0.00	0.00	0.32	0.06
16	1.02	0.19	0.00	0.00	0.26	0.05
17	0.89	0.16	0.00	0.00	0.22	0.04
18	0.77	0.13	0.00	0.00	0.20	0.03
19	0.75	0.12	0.00	0.00	0.16	0.03
20	0.59	0.09	0.00	0.00	0.11	0.02
21	0.46	0.07	0.00	0.00	0.06	0.01
22	0.38	0.05	0.00	0.00	0.04	0.01

TABLE 57 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 38

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.31	0.04	0.00	0.00	0.04	0.00
24	0.26	0.03	0.00	0.00	0.03	0.00
25	0.22	0.03	0.00	0.00	0.03	0.00
26	0.19	0.02	0.00	0.00	0.02	0.00
27	0.16	0.02	0.00	0.00	0.02	0.00
28	0.14	0.01	0.00	0.00	0.01	0.00
29	0.12	0.01	0.00	0.00	0.01	0.00
30	0.10	0.01	0.00	0.00	0.01	0.00
31	0.09	0.01	0.00	0.00	0.01	0.00
32	0.07	0.01	0.00	0.00	0.01	0.00
33	0.07	0.01	0.00	0.00	0.01	0.00
34	0.08	0.01	0.00	0.00	0.01	0.00
35	0.07	0.01	0.00	0.00	0.00	0.00
36	0.05	0.00	0.00	0.00	0.00	0.00
37	0.04	0.00	0.00	0.00	0.00	0.00
38	0.03	0.00	0.00	0.00	0.00	0.00
39	0.02	0.00	0.00	0.00	0.00	0.00
40	0.01	0.00	0.00	0.00	0.00	0.00

TABLE 58

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/FLORISIL
SAMPLE NO: 8670+60+25+40

REACTOR LOADING, MLS :	450.0	T, C :	260.0	FEED RATIO,	
CATALYST LOADING, WT%:	19.7	P, PSIG :	300	CO/H2:	1.00
TIME ON STREAM, HRS :	474.1	SV, L/G/HR:	1.00		

USAGE RATIO, CO/H2 :	0.65	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	39.03	MOL SYNGAS/KG CAT/HR:	17.421
%CO CONV. :	30.66	SPECIFIC ACTIVITY,	
%H2 CONV. :	47.41	MOL CO/MOL METAL/MIN:	0.140

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	11.61	H20:	17.32
OXYGENATES :	0.58	CO :	60.88
C02 :	6.31	H2 :	3.29

HYDROCARBON SELECTIVITY, WT%:

C1 :	14.68	C4+ENE :	3.42
C2+ANE :	3.32	C5+C11 :	29.89
C2+ENE :	0.00	C12+C18:	12.52
C3+ANE :	3.77	C19+C23:	13.21
C3+ENE :	2.94	C24+34 :	11.91
C4 ISO+ANE:	3.51	C35+ :	0.83

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	29.89
DIESEL (C9+C25) :	41.68

% ELEMENTAL RECOVERY:

CARBON :	100.34
HYDROGEN:	115.95
OXYGEN :	109.59

TABLE 59

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 40

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	14.68	52.65	0.00	0.00	0.00	0.00
2	3.32	6.36	0.00	0.00	0.00	0.00
3	3.77	4.92	2.94	4.01	0.00	0.00
4	3.41	3.38	3.42	3.51	0.10	0.10
5	3.42	2.72	3.02	2.48	0.34	0.27
6	3.84	2.56	1.03	0.70	0.00	0.00
7	2.99	1.72	0.31	0.18	0.00	0.00
8	2.25	1.13	0.25	0.13	0.63	0.32
9	3.46	1.55	0.00	0.00	0.94	0.42
10	3.34	1.35	0.00	0.00	0.94	0.38
11	2.42	0.89	0.00	0.00	0.69	0.25
12	2.01	0.68	0.00	0.00	0.53	0.18
13	1.72	0.54	0.00	0.00	0.47	0.15
14	1.50	0.43	0.00	0.00	0.41	0.12
15	1.30	0.35	0.00	0.00	0.35	0.09
16	1.17	0.30	0.00	0.00	0.31	0.08
17	1.11	0.26	0.00	0.00	0.29	0.07
18	1.15	0.26	0.00	0.00	0.20	0.05
19	1.72	0.37	0.00	0.00	0.18	0.04
20	2.57	0.52	0.00	0.00	0.24	0.05
21	2.80	0.54	0.00	0.00	0.28	0.05
22	2.59	0.48	0.00	0.00	0.27	0.05

TABLE 59 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 40

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	2.29	0.41	0.00	0.00	0.26	0.05
24	1.99	0.34	0.00	0.00	0.22	0.04
25	1.72	0.28	0.00	0.00	0.20	0.03
26	1.47	0.23	0.00	0.00	0.17	0.03
27	1.22	0.18	0.00	0.00	0.16	0.02
28	1.02	0.15	0.00	0.00	0.12	0.02
29	0.80	0.11	0.00	0.00	0.11	0.02
30	0.66	0.09	0.00	0.00	0.11	0.01
31	0.53	0.07	0.00	0.00	0.13	0.02
32	0.40	0.05	0.00	0.00	0.07	0.01
33	0.33	0.04	0.00	0.00	0.10	0.01
34	0.27	0.03	0.00	0.00	0.09	0.01
35	0.32	0.04	0.00	0.00	0.03	0.00
36	0.12	0.01	0.00	0.00	0.00	0.00
37	0.08	0.01	0.00	0.00	0.01	0.00
38	0.11	0.01	0.00	0.00	0.02	0.00
39	0.09	0.01	0.00	0.00	0.00	0.00
40	0.07	0.01	0.00	0.00	0.00	0.00

TABLE 60

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/Florisil
SAMPLE No: 8670+60+25+42

REACTOR LOADING, MLS :	450.0	T, C :	241.4	FEED RATIO,	
CATALYST LOADING, WT%:	19.7	P, PSIG :	300	CO/H2:	1.00
TIME ON STREAM, HRS :	547.4	SV, L/G/HR:	2.00		

USAGE RATIO, CO/H2 :	0.39	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	12.14	MOL SYNGAS/KG CAT/HR:	10.825
%CO CONV. :	6.80	SPECIFIC ACTIVITY,	
%H2 CONV. :	17.47	MOL CO/MOL METAL/MIN:	0.062

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	3.01	H20:	4.44
OXYGENATES :	0.06	CO :	86.56
CO2 :	0.46	H2 :	5.47

HYDROCARBON SELECTIVITY, WT%:

C1 :	13.10	C4+ENE :	5.22
C2+ANE :	2.42	C5+C11 :	39.12
C2+ENE :	0.45	C12+C18:	21.11
C3+ANE :	2.86	C19+C23:	4.75
C3+ENE :	5.69	C24+34 :	1.54
C4 ISO+ANE:	3.56	C35+ :	0.18

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	39.12
DIESEL (C9+C25) :	37.15

% ELEMENTAL RECOVERY:

CARBON :	99.88
HYDROGEN:	97.69
OXYGEN :	101.31

TABLE 61

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670†60†25

SAMPLE NO. 42

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	13.10	45.40	0.00	0.00	0.00	0.00
2	2.42	4.47	0.45	0.89	0.00	0.00
3	2.86	3.60	5.69	7.51	0.00	0.00
4	3.56	3.41	5.22	5.16	0.00	0.00
5	3.91	3.01	5.84	4.63	0.00	0.00
6	7.71	4.97	0.26	0.17	0.00	0.00
7	3.85	2.13	0.53	0.30	1.59	0.88
8	3.87	1.88	0.59	0.29	0.19	0.09
9	3.36	1.46	0.44	0.19	0.16	0.07
10	3.12	1.22	0.45	0.18	0.24	0.09
11	2.32	0.82	0.26	0.09	0.46	0.16
12	3.10	1.01	0.00	0.00	0.40	0.13
13	3.06	0.92	0.00	0.00	0.55	0.17
14	2.87	0.80	0.00	0.00	0.59	0.16
15	2.59	0.68	0.00	0.00	0.56	0.15
16	2.29	0.56	0.09	0.02	0.42	0.10
17	1.99	0.46	0.06	0.01	0.41	0.09
18	1.72	0.38	0.00	0.00	0.40	0.09
19	1.51	0.31	0.00	0.00	0.38	0.08
20	1.10	0.22	0.00	0.00	0.32	0.06
21	0.57	0.11	0.00	0.00	0.13	0.02
22	0.37	0.07	0.00	0.00	0.04	0.01

TABLE 61 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+60+25

SAMPLE NO. 42

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.29	0.05	0.00	0.00	0.03	0.01
24	0.24	0.04	0.00	0.00	0.03	0.00
25	0.21	0.03	0.00	0.00	0.02	0.00
26	0.18	0.03	0.00	0.00	0.02	0.00
27	0.15	0.02	0.00	0.00	0.01	0.00
28	0.13	0.02	0.00	0.00	0.02	0.00
29	0.11	0.01	0.00	0.00	0.01	0.00
30	0.09	0.01	0.00	0.00	0.01	0.00
31	0.08	0.01	0.00	0.00	0.01	0.00
32	0.07	0.01	0.00	0.00	0.01	0.00
33	0.07	0.01	0.00	0.00	0.01	0.00
34	0.06	0.01	0.00	0.00	0.00	0.00
35	0.05	0.01	0.00	0.00	0.00	0.00
36	0.04	0.00	0.00	0.00	0.00	0.00
37	0.03	0.00	0.00	0.00	0.00	0.00
38	0.02	0.00	0.00	0.00	0.00	0.00
39	0.02	0.00	0.00	0.00	0.00	0.00
40	0.01	0.00	0.00	0.00	0.00	0.00

Table 6?

SLURRY SCREENING SUMMARY
8670-57-27

17.4 wt. (76.3g) $Co_2(CO)_8/Ti(OPr)_4/SiO_2$

Sample No.	Time on Stream h	P psig	T °C	Space Velocity L/g/hr	%CO+H_2	%CO	%H_2	Feed CO/H_2	Usage $\Delta CO/\Delta H_2$	Bulk Activity mol syngas/ kg cat/h	Specific Activity Mol CO/ Mol Co/min	Selectivity Wt% C_1	C_2-C_4	C_5-C_{11}	C_{12}-C_{18}	C_{19}-C_{23}	C_{24}^+	C_5-C_{23}
3	[illegible]	296	240	2.0	20.0	9.8	30.2	1.0	0.32	17.9	0.083	12.6	26.5	37.1	16.4	5.2	2.2	58.7
6	[illegible]	297	241	2.0	12.5	2.2	31.6	1.9	0.13	11.0	0.024	10.1	17.7	33.0	18.3	12.0	8.9	64.1
9	120	298	241	2.0	19.8	7.4	28.3	1.5	0.39	14.1	0.075	13.8	21.4	34.2	17.7	7.6	5.3	59.5
12	168	296	240	1.0	11.2	2.2	29.6	2.0	0.15	5.0	0.013	9.8	14.9	31.8	21.5	11.3	10.7	64.6
15	313	302	240	1.0	26.8	18.1	35.5	1.0	0.51	12.0	0.077	13.9	17.4	34.8	20.6	8.0	5.3	63.4
18	336	300	241	1.1	23.9	16.6	34.8	1.5	0.72	11.9	0.094	11.2	15.3	32.5	24.1	10.6	6.3	67.2
24	413	300	261	2.0	33.0	24.7	41.8	1.0	0.58	29.5	0.206	15.3	13.7	29.6	21.3	10.6	9.6	61.5
27	437	300	261	2.0	28.7	19.2	42.8	1.5	0.67	25.6	0.196	12.3	13.2	32.3	25.1	11.0	6.1	68.4
30	462	300	261	2.0	22.7	15.8	36.8	2.0	0.87	20.3	0.180	11.7	11.6	26.1	26.2	16.2	8.2	68.5
33	482	300	261	1.0	32.3	21.1	55.0	2.0	0.78	14.4	0.120	11.0	11.5	31.2	25.0	14.3	7.0	70.5
36	509	300	261	1.0	34.3	23.3	51.0	1.5	0.69	15.3	0.119	12.1	11.5	28.0	21.3	13.4	13.7	62.7
40	556	300	260	1.0	37.1	25.8	48.5	1.0	0.53	16.6	0.110	14.5	12.4	35.0	25.1	7.8	5.2	67.9
42	580	300	262	3.0	18.4	13.2	23.6	1.0	0.56	24.6	0.168	15.5	12.0	38.4	19.4	9.0	5.7	66.8
44	604	300	262	2.0	41.1	28.8	53.3	1.0	0.54	36.7	0.245	23.5	17.3	34.3	15.2	6.0	3.7	55.5
47	677	300	280	3.0	30.1	20.9	39.3	1.0	0.53	40.3	0.267	24.6	18.0	34.2	14.1	6.4	2.7	54.7
50	701	300	240	2.0	12.6	10.4	14.9	1.0	0.70	11.3	0.068	17.8	13.6	34..	13.3	13.6	6.9	61.7

TABLE 63

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Ti/SILICA
SAMPLE NO: 8670+57+27+3

REACTOR LOADING, MLS :	450.0	T, C :	240.3	FEED RATIO,	
CATALYST LOADING, WT%:	17.4	P, PSIG :	298	CO/H2:	1.00
TIME ON STREAM, HRS :	23.2	SV, L/G/HR:	2.00		

USAGE RATIO, CO/H2 :	0.32	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	20.01	MOL SYNGAS/KG CAT/HR:	17.868
%CO CONV. :	9.77	SPECIFIC ACTIVITY,	
%H2 CONV. :	30.24	MOL CO/MOL METAL/MIN:	0.083

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	5.48	H2O:	7.77
OXYGENATES :	0.34	CO :	81.56
CO2 :	0.36	H2 :	4.50

HYDROCARBON SELECTIVITY, WT%:

C1 :	12.59	C4+ENE :	6.69
C2+ANE :	3.88	C5+C11 :	37.15
C2+ENE :	0.73	C12+C18:	16.39
C3+ANE :	2.68	C19+C23:	5.24
C3+ENE :	8.88	C24+34 :	2.01
C4 ISO+ANE:	3.61	C35+ :	0.14

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	37.15
DIESEL (C9+C25) :	30.81

% ELEMENTAL RECOVERY:

CARBON :	102.73
HYDROGEN:	97.98
OXYGEN :	104.31

TABLE 64

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 3

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	12.59	41.48	0.00	0.00	0.00	0.00
2	3.88	6.82	0.73	1.37	0.00	0.00
3	2.68	3.22	8.88	11.15	0.00	0.00
4	3.61	3.28	6.69	6.30	0.00	0.00
5	3.88	2.84	5.72	4.31	0.15	0.11
6	7.01	4.30	2.18	1.37	0.00	0.00
7	3.10	1.63	1.75	0.94	0.79	0.42
8	1.81	0.84	0.56	0.26	1.53	0.71
9	1.62	0.67	0.55	0.23	0.84	0.34
10	1.65	0.61	0.46	0.17	0.86	0.32
11	1.91	0.64	0.04	0.01	0.75	0.25
12	2.02	0.63	0.00	0.00	0.57	0.18
13	1.93	0.55	0.00	0.00	0.48	0.14
14	1.86	0.49	0.00	0.00	0.42	0.11
15	1.83	0.45	0.00	0.00	0.42	0.10
16	1.70	0.40	0.00	0.00	0.51	0.12
17	2.13	0.47	0.00	0.00	0.30	0.07
18	1.67	0.35	0.00	0.00	0.56	0.12
19	1.38	0.27	0.00	0.00	0.31	0.06
20	1.15	0.21	0.00	0.00	0.18	0.03
21	0.83	0.15	0.00	0.00	0.08	0.01
22	0.63	0.11	0.00	0.00	0.07	0.01

TABLE 64 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670†57†27

SAMPLE NO. 3

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.53	0.09	0.00	0.00	0.08	0.01
24	0.27	0.04	0.00	0.00	0.00	0.00
25	0.24	0.04	0.00	0.00	0.00	0.00
26	0.20	0.03	0.00	0.00	0.00	0.00
27	0.16	0.02	0.00	0.00	0.00	0.00
28	0.05	0.01	0.00	0.00	0.26	0.03
29	0.01	0.00	0.00	0.00	0.05	0.01
30	0.08	0.01	0.00	0.00	0.03	0.00
31	0.17	0.02	0.00	0.00	0.03	0.00
32	0.16	0.02	0.00	0.00	0.02	0.00
33	0.15	0.02	0.00	0.00	0.00	0.00
34	0.10	0.01	0.00	0.00	0.04	0.00
35	0.14	0.01	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 65

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Ti/SILICA
SAMPLE NO: 8670+57+27+6

REACTOR LOADING, MLS :	450.0	T, C :	240.6	FEED RATIO,	
CATALYST LOADING, WT%:	17.4	P, PSIG :	297	CO/H2:	1.86
TIME ON STREAM, HRS :	145.1	SV, L/G/HR:	2.00		

USAGE RATIO, CO/H2 :	0.13	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	12.47	MOL SYNGAS/KG CAT/HR:	11.009
%CO CONV. :	2.21	SPECIFIC ACTIVITY,	
%H2 CONV. :	31.59	MOL CO/MOL METAL/MIN:	0.024

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	2.87	H2O:	5.02
OXYGENATES :	0.07	CO :	89.41
CO2 :	0.23	H2 :	2.40

HYDROCARBON SELECTIVITY, WT%:

C1 :	10.08	C4+ENE :	6.22
C2+ANE :	1.12	C5+C11 :	33.01
C2+ENE :	1.25	C12+C18:	18.26
C3+ANE :	0.83	C19+C23:	11.98
C3+ENE :	6.85	C24+34 :	7.73
C4 ISO+ANE:	1.44	C35+ :	1.22

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	33.01
DIESEL (C9+C25) :	42.32

% ELEMENTAL RECOVERY:

CARBON :	104.20
HYDROGEN:	97.71
OXYGEN :	106.70

TABLE 66

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 6

CARBON NO.	n-ALKANES WT %	n-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	10.08	41.16	0.00	0.00	0.00	0.00
2	1.12	2.44	1.25	2.92	0.00	0.00
3	0.83	1.24	6.85	10.66	0.00	0.00
4	1.44	1.63	6.22	7.26	0.00	0.00
5	1.67	1.52	6.92	6.46	0.00	0.00
6	5.72	4.35	1.52	1.18	0.00	0.00
7	2.82	1.84	1.11	0.74	0.61	0.40
8	1.71	0.98	1.46	0.85	0.28	0.16
9	1.32	0.67	1.58	0.82	0.40	0.20
10	1.31	0.60	1.50	0.70	0.49	0.23
11	1.09	0.46	1.06	0.45	0.44	0.18
12	1.18	0.45	0.93	0.36	0.50	0.19
13	1.43	0.51	0.92	0.33	0.43	0.15
14	1.46	0.48	0.84	0.28	0.23	0.08
15	1.65	0.51	0.64	0.20	0.21	0.07
16	2.46	0.71	0.00	0.00	0.08	0.02
17	2.48	0.67	0.00	0.00	0.12	0.03
18	2.55	0.66	0.00	0.00	0.15	0.04
19	2.59	0.63	0.00	0.00	0.09	0.02
20	2.58	0.60	0.00	0.00	0.09	0.02
21	2.43	0.54	0.00	0.00	0.08	0.02
22	2.15	0.45	0.00	0.00	0.07	0.01

TABLE 66 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 6

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.84	0.37	0.00	0.00	0.06	0.01
24	1.52	0.29	0.00	0.00	0.04	0.01
25	1.33	0.25	0.00	0.00	0.00	0.00
26	1.12	0.20	0.00	0.00	0.00	0.00
27	0.87	0.15	0.00	0.00	0.00	0.00
28	0.73	0.12	0.00	0.00	0.00	0.00
29	0.37	0.06	0.00	0.00	0.02	0.00
30	0.30	0.05	0.00	0.00	0.02	0.00
31	0.38	0.06	0.00	0.00	0.02	0.00
32	0.32	0.05	0.00	0.00	0.01	0.00
33	0.26	0.04	0.00	0.00	0.03	0.00
34	0.34	0.05	0.00	0.00	0.05	0.01
35	0.41	0.05	0.00	0.00	0.00	0.00
36	0.32	0.04	0.00	0.00	0.00	0.00
37	0.19	0.02	0.00	0.00	0.00	0.00
38	0.11	0.01	0.00	0.00	0.00	0.00
39	0.12	0.01	0.00	0.00	0.00	0.00
40	0.07	0.01	0.00	0.00	0.00	0.00

TABLE 67

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Ti/SILICA
SAMPLE No: 8670+57+27+9

REACTOR LOADING, MLS :	450.0	T, C :	243.2	FEED RATIO,	
CATALYST LOADING, WT%:	17.4	P, PSIG :	290	CO/H2:	1.50
TIME ON STREAM, HRS :	194.6	SV, L/G/HR:	2.00		

USAGE RATIO, CO/H2 :	0.39	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	15.75	MOL SYNGAS/KG CAT/HR:	14.066
%CO CONV. :	7.38	SPECIFIC ACTIVITY,	
%H2 CONV. :	28.32	MOL CO/MOL METAL/MIN:	0.075

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	3.45	H2O:	6.28
OXYGENATES :	0.09	CO :	86.69
CO2 :	0.30	H2 :	3.19

HYDROCARBON SELECTIVITY, WT%:

C1 :	13.79	C4+ENE :	7.05
C2+ANE :	2.01	C5+C11 :	34.18
C2+ENE :	1.16	C12+C18:	17.68
C3+ANE :	1.25	C19+C23:	7.59
C3+ENE :	7.93	C24+34 :	4.69
C4 ISO+ANE:	2.05	C35+ :	0.63

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	34.18
DIESEL (C9+C25) :	37.44

% ELEMENTAL RECOVERY:

CARBON :	100.13
HYDROGEN:	100.39
OXYGEN :	103.53

TABLE 68

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 9

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	13.79	46.96	0.00	0.00	0.00	0.00
2	2.01	3.64	1.16	2.25	0.00	0.00
3	1.25	1.55	7.93	10.29	0.00	0.00
4	2.05	1.92	7.05	6.86	0.00	0.00
5	2.11	1.60	7.65	5.96	0.17	0.13
6	6.12	3.88	0.16	0.10	0.00	0.00
7	2.06	1.12	1.89	1.05	0.12	0.07
8	1.54	0.74	1.57	0.76	0.20	0.10
9	1.65	0.70	1.57	0.68	0.67	0.28
10	1.73	0.66	1.45	0.57	0.47	0.18
11	1.49	0.52	1.05	0.37	0.51	0.18
12	1.53	0.49	0.95	0.31	0.49	0.16
13	1.77	0.52	0.85	0.25	0.41	0.12
14	1.76	0.48	0.74	0.21	0.14	0.04
15	1.77	0.46	0.66	0.17	0.07	0.02
16	2.27	0.55	0.00	0.00	0.07	0.02
17	2.11	0.48	0.00	0.00	0.06	0.01
18	1.96	0.42	0.00	0.00	0.09	0.02
19	1.84	0.37	0.00	0.00	0.06	0.01
20	1.72	0.33	0.00	0.00	0.05	0.01
21	1.52	0.28	0.00	0.00	0.04	0.01
22	1.27	0.22	0.00	0.00	0.04	0.01

TABLE 68 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 9

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.03	0.17	0.00	0.00	0.03	0.01
24	0.83	0.13	0.00	0.00	0.02	0.00
25	0.73	0.11	0.00	0.00	0.00	0.00
26	0.61	0.09	0.00	0.00	0.00	0.00
27	0.52	0.07	0.00	0.00	0.00	0.00
28	0.45	0.06	0.00	0.00	0.00	0.00
29	0.27	0.04	0.00	0.00	0.01	0.00
30	0.24	0.03	0.00	0.00	0.02	0.00
31	0.26	0.03	0.00	0.00	0.02	0.00
32	0.29	0.03	0.00	0.00	0.00	0.00
33	0.22	0.03	0.00	0.00	0.01	0.00
34	0.16	0.02	0.00	0.00	0.03	0.00
35	0.18	0.02	0.00	0.00	0.00	0.00
36	0.15	0.02	0.00	0.00	0.00	0.00
37	0.10	0.01	0.00	0.00	0.00	0.00
38	0.07	0.01	0.00	0.00	0.00	0.00
39	0.07	0.01	0.00	0.00	0.00	0.00
40	0.05	0.01	0.00	0.00	0.00	0.00

TABLE 69

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Ti/SILICA
SAMPLE No: 8670+57+27+12

REACTOR LOADING, MLS :	450-0	T, C :	239.6	FEED RATIO,	
CATALYST LOADING, WT%:	17.4	P, PSIG :	298	CO/H2:	2.03
TIME ON STREAM, HRS :	265.6	SV, L/G/HR:	1.00		

USAGE RATIO, CO/H2 :	0.15	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	11.25	MOL SYNGAS/KG CAT/HR:	5.027
%CO CONV. :	2.22	SPECIFIC ACTIVITY,	
%H2 CONV. :	29.62	MOL CO/MOL METAL/MIN:	0.013

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	3.46	H2O:	6.89
OXYGENATES :	0.10	CO :	86.99
CO2 :	0.36	H2 :	2.20

HYDROCARBON SELECTIVITY, WT%:

C1 :	9.82	C4+ENE :	5.10
C2+ANE :	1.00	C5+C11 :	31.75
C2+ENE :	0.99	C12+C18:	21.49
C3+ANE :	0.77	C19+C23:	11.34
C3+ENE :	5.77	C24+34 :	9.69
C4 ISO+ANE:	1.26	C35+ :	1.02

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	31.75
DIESEL (C9+C25) :	47.17

% ELEMENTAL RECOVERY:

CARBON :	105.80
HYDROGEN:	113.00
OXYGEN :	110.40

TABLE 70

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670†57†27

SAMPLE NO. 12

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	9.82	42.49	0.00	0.00	0.00	0.00
2	1.00	2.30	0.99	2.45	0.00	0.00
3	0.77	1.21	5.77	9.51	0.00	0.00
4	1.26	1.50	5.10	6.30	0.00	0.00
5	1.58	1.52	6.32	6.25	0.00	0.00
6	5.61	4.51	0.11	0.09	0.00	0.00
7	1.73	1.20	1.86	1.31	0.10	0.07
8	1.28	0.78	1.46	0.90	0.36	0.22
9	1.47	0.80	1.66	0.91	0.75	0.40
10	1.65	0.81	1.89	0.93	0.56	0.27
11	1.38	0.61	1.41	0.63	0.57	0.25
12	1.44	0.59	1.23	0.51	0.54	0.22
13	1.67	0.63	1.08	0.41	0.50	0.19
14	1.81	0.63	0.96	0.34	0.26	0.09
15	1.97	0.64	0.83	0.27	0.24	0.08
16	2.93	0.90	0.00	0.00	0.10	0.03
17	2.99	0.86	0.00	0.00	0.09	0.03
18	2.78	0.76	0.00	0.00	0.06	0.02
19	2.66	0.69	0.00	0.00	0.04	0.01
20	2.48	0.61	0.00	0.00	0.03	0.01
21	2.19	0.51	0.00	0.00	0.02	0.00
22	2.12	0.47	0.00	0.00	0.01	0.00

TABLE 70 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 12

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.80	0.38	0.00	0.00	0.01	0.00
24	1.60	0.33	0.00	0.00	0.00	0.00
25	1.40	0.27	0.00	0.00	0.00	0.00
26	1.20	0.23	0.00	0.00	0.00	0.00
27	1.10	0.20	0.00	0.00	0.00	0.00
28	1.02	0.18	0.00	0.00	0.00	0.00
29	0.69	0.12	0.00	0.00	0.00	0.00
30	0.67	0.11	0.00	0.00	0.00	0.00
31	0.60	0.09	0.00	0.00	0.00	0.00
32	0.56	0.09	0.00	0.00	0.00	0.00
33	0.46	0.07	0.00	0.00	0.00	0.00
34	0.40	0.06	0.00	0.00	0.00	0.00
35	0.32	0.05	0.00	0.00	0.00	0.00
36	0.30	0.04	0.00	0.00	0.00	0.00
37	0.16	0.02	0.00	0.00	0.00	0.00
38	0.12	0.02	0.00	0.00	0.00	0.00
39	0.12	0.01	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 71

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

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CATALYST : Co/Ti/SILICA
SAMPLE NO: 8670+57+27+15

REACTOR LOADING, MLS :	450.0	T, C :	239.9	FEED RATIO, CO/H2:	1.00
CATALYST LOADING, WT%:	17.4	P, PSIG :	302		
TIME ON STREAM, HRS :	313.4	SV, L/G/HR:	1.00		

++

USAGE RATIO, CO/H2 :	0.51	BULK ACTIVITY, MOL SYNGAS/KG CAT/HR:	11.964
%OVERALL CONV., CO+H2:	26.76	SPECIFIC ACTIVITY, MOL CO/MOL METAL/MIN:	0.077
%CO CONV. :	18.06		
%H2 CONV. :	35.48		

++

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	6.41	H2O:	13.24
OXYGENATES :	0.25	CO :	75.41
CO2 :	0.45	H2 :	4.24

++

HYDROCARBON SELECTIVITY, WT%:

C1 :	13.90	C4+ENE :	5.08
C2+ANE :	2.23	C5+C11 :	34.76
C2+ENE :	0.61	C12+C18:	20.65
C3+ANE :	1.43	C19+C23:	7.95
C3+ENE :	5.88	C24+34 :	4.82
C4 ISO+ANE:	2.22	C35+ :	0.47

++

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	34.76
DIESEL (C9+C25) :	44.30

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% ELEMENTAL RECOVERY:

CARBON :	96.15
HYDROGEN:	103.61
OXYGEN :	105.11

++

TABLE 72

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 15

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	13.90	49.57	0.00	0.00	0.00	0.00
2	2.23	4.24	0.61	1.24	0.00	0.00
3	1.43	1.86	5.88	8.00	0.00	0.00
4	2.22	2.19	5.08	5.17	0.00	0.00
5	2.43	1.93	5.47	4.46	0.00	0.00
6	3.59	2.39	1.41	0.96	0.10	0.07
7	2.24	1.28	1.16	0.67	0.35	0.20
8	1.84	0.92	1.27	0.64	0.73	0.37
9	2.08	0.93	1.76	0.80	0.94	0.42
10	2.26	0.91	1.73	0.70	1.13	0.46
11	2.24	0.82	1.14	0.42	0.90	0.33
12	2.21	0.74	0.79	0.27	0.55	0.18
13	2.18	0.68	0.58	0.18	0.48	0.15
14	2.55	0.74	0.00	0.00	0.41	0.12
15	2.57	0.69	0.00	0.00	0.32	0.09
16	2.53	0.64	0.00	0.00	0.23	0.06
17	2.68	0.64	0.00	0.00	0.05	0.01
18	2.29	0.51	0.00	0.00	0.23	0.05
19	2.12	0.45	0.00	0.00	0.13	0.03
20	1.90	0.38	0.00	0.00	0.01	0.00
21	1.50	0.29	0.00	0.00	0.01	0.00
22	1.26	0.23	0.00	0.00	0.00	0.00

TABLE 72 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 15

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.01	0.18	0.00	0.00	0.00	0.00
24	0.83	0.14	0.00	0.00	0.00	0.00
25	0.70	0.11	0.00	0.00	0.00	0.00
26	0.60	0.09	0.00	0.00	0.00	0.00
27	0.55	0.08	0.00	0.00	0.00	0.00
28	0.45	0.06	0.00	0.00	0.00	0.00
29	0.32	0.04	0.00	0.00	0.00	0.00
30	0.32	0.04	0.00	0.00	0.00	0.00
31	0.32	0.04	0.00	0.00	0.00	0.00
32	0.27	0.03	0.00	0.00	0.00	0.00
33	0.24	0.03	0.00	0.00	0.00	0.00
34	0.22	0.03	0.00	0.00	0.00	0.00
35	0.18	0.02	0.00	0.00	0.00	0.00
36	0.14	0.02	0.00	0.00	0.00	0.00
37	0.08	0.01	0.00	0.00	0.00	0.00
38	0.07	0.01	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 73

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Ti/Silica
SAMPLE No: 8670+57+27+18

REACTOR LOADING, MLS :	450.0	T, C :	240.6	FEED RATIO,	
CATALYST LOADING, WT%:	17.4	P, PSIG :	300	CO/H2:	1.50
TIME ON STREAM, HRS :	335.8	SV, L/G/HR:	1.11		

USAGE RATIO, CO/H2 :	0.72	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	23.94	MOL SYNGAS/KG CAT/HR:	11.878
%CO CONV. :	16.65	SPECIFIC ACTIVITY,	
%H2 CONV. :	34.85	MOL CO/MOL METAL/MIN:	0.094

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	4.58	H2O:	8.60
OXYGENATES :	0.15	CO :	83.21
CO2 :	0.35	H2 :	3.10

HYDROCARBON SELECTIVITY, WT%:

C1 :	11.16	C4+ENE :	5.07
C2+ANE :	1.39	C5+C11 :	32.46
C2+ENE :	0.81	C12+C18:	24.08
C3+ANE :	0.90	C19+C23:	10.63
C3+ENE :	5.66	C24+34 :	5.69
C4 ISO+ANE:	1.51	C35+ :	0.64

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	32.46
DIESEL (C9+C25) :	48.21

% ELEMENTAL RECOVERY:

CARBON :	92.72
HYDROGEN:	101.23
OXYGEN :	97.29

TABLE 74

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 18

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	11.16	45.22	0.00	0.00	0.00	0.00
2	1.39	3.00	0.81	1.87	0.00	0.00
3	0.90	1.33	5.66	8.74	0.00	0.00
4	1.51	1.69	5.07	5.86	0.00	0.00
5	1.83	1.64	5.55	5.13	0.00	0.00
6	6.30	4.75	0.00	0.00	0.00	0.00
7	2.31	1.50	1.56	1.03	0.11	0.07
8	1.63	0.93	1.27	0.74	0.42	0.24
9	1.45	0.73	1.54	0.79	0.60	0.30
10	1.63	0.74	1.74	0.80	0.84	0.38
11	1.48	0.61	1.39	0.58	0.83	0.34
12	1.75	0.67	1.21	0.47	0.81	0.31
13	1.92	0.68	0.92	0.33	0.59	0.21
14	2.89	0.95	0.00	0.00	0.51	0.17
15	2.94	0.90	0.00	0.00	0.44	0.13
16	3.02	0.87	0.00	0.00	0.37	0.10
17	3.13	0.85	0.00	0.00	0.28	0.08
18	3.13	0.80	0.00	0.00	0.17	0.04
19	2.63	0.64	0.00	0.00	0.19	0.05
20	2.45	0.56	0.00	0.00	0.06	0.01
21	2.08	0.46	0.00	0.00	0.05	0.01
22	1.71	0.36	0.00	0.00	0.04	0.01

TABLE 74 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 18

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.37	0.27	0.00	0.00	0.03	0.01
24	1.09	0.21	0.00	0.00	0.02	0.00
25	0.90	0.16	0.00	0.00	0.01	0.00
26	0.80	0.14	0.00	0.00	0.00	0.00
27	0.65	0.11	0.00	0.00	0.00	0.00
28	0.45	0.07	0.00	0.00	0.01	0.00
29	0.36	0.06	0.00	0.00	0.01	0.00
30	0.30	0.05	0.00	0.00	0.02	0.00
31	0.29	0.04	0.00	0.00	0.02	0.00
32	0.32	0.05	0.00	0.00	0.00	0.00
33	0.21	0.03	0.00	0.00	0.01	0.00
34	0.19	0.03	0.00	0.00	0.02	0.00
35	0.19	0.02	0.00	0.00	0.01	0.00
36	0.15	0.02	0.00	0.00	0.00	0.00
37	0.11	0.01	0.00	0.00	0.00	0.00
38	0.08	0.01	0.00	0.00	0.00	0.00
39	0.07	0.01	0.00	0.00	0.00	0.00
40	0.04	0.00	0.00	0.00	0.00	0.00

TABLE 75

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Ti/SILICA
SAMPLE No: 8670+57+27+24

REACTOR LOADING, MLS :	450.0	T, C :	260.7	FEED RATIO,	
CATALYST LOADING, WT%:	17.4	P, PSIG :	300	CO/H2:	1.00
TIME ON STREAM, HRS :	413.3	SV, L/G/HR:	2.00		

USAGE RATIO, CO/H2 :	0.58	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	33.00	MOL SYNGAS/KG CAT/HR:	29.454
%CO CONV. :	24.19	SPECIFIC ACTIVITY,	
%H2 CONV. :	41.80	MOL CO/MOL METAL/MIN:	0.206

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	8.25	H20:	12.80
OXYGENATES :	0.25	CO :	74.09
CO2 :	0.55	H2 :	4.06

HYDROCARBON SELECTIVITY, WT%:

C1 :	15.27	C4+ENE :	3.93
C2+ANE :	2.02	C5+C11 :	29.59
C2+ENE :	0.48	C12+C18:	21.28
C3+ANE :	1.07	C19+C23:	10.57
C3+ENE :	4.43	C24+34 :	8.60
C4 ISO+ANE:	1.73	C35+ :	1.01

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	29.59
DIESEL (C9+C25) :	43.39

% ELEMENTAL RECOVERY:

CARBON :	92.87
HYDROGEN:	98.81
OXYGEN :	97.07

TABLE 76

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 24

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	15.27	54.90	0.00	0.00	0.00	0.00
2	2.02	3.87	0.48	0.99	0.00	0.00
3	1.07	1.40	4.43	6.07	0.00	0.00
4	1.73	1.72	3.93	4.04	0.00	0.00
5	2.08	1.66	4.60	3.78	0.06	0.05
6	6.89	4.61	0.00	0.00	0.00	0.00
7	2.60	1.49	1.49	0.88	0.14	0.08
8	1.79	0.90	1.01	0.52	0.17	0.09
9	1.50	0.67	0.92	0.42	0.24	0.11
10	1.67	0.67	0.90	0.37	0.40	0.16
11	1.82	0.67	0.76	0.29	0.54	0.20
12	1.99	0.67	0.68	0.23	0.43	0.15
13	2.12	0.66	0.49	0.16	0.45	0.14
14	2.56	0.74	0.25	0.07	0.22	0.06
15	2.53	0.69	0.20	0.06	0.24	0.07
16	2.56	0.65	0.16	0.04	0.27	0.07
17	2.71	0.65	0.12	0.03	0.22	0.05
18	2.84	0.64	0.00	0.00	0.23	0.05
19	2.60	0.56	0.00	0.00	0.11	0.02
20	2.44	0.50	0.00	0.00	0.10	0.02
21	0.28	0.06	0.00	0.00	1.76	0.34
22	1.65	0.31	0.00	0.00	0.06	0.01

TABLE 76 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 24

CARBON NO.	N-ALKANES		1-ALKENE		BRANCHED ISOMERS	
	WT %	MOLE %	WT %	MOLE %	WT %	MOLE %
23	1.47	0.26	0.00	0.00	0.09	0.02
24	1.29	0.22	0.00	0.00	0.07	0.01
25	1.38	0.22	0.00	0.00	0.04	0.01
26	1.13	0.18	0.00	0.00	0.03	0.01
27	0.95	0.14	0.00	0.00	0.02	0.00
28	0.78	0.11	0.00	0.00	0.03	0.00
29	0.64	0.09	0.00	0.00	0.02	0.00
30	0.53	0.07	0.00	0.00	0.02	0.00
31	0.50	0.07	0.00	0.00	0.02	0.00
32	0.42	0.05	0.00	0.00	0.01	0.00
33	0.35	0.04	0.00	0.00	0.01	0.00
34	0.32	0.04	0.00	0.00	0.02	0.00
35	0.31	0.04	0.00	0.00	0.01	0.00
36	0.25	0.03	0.00	0.00	0.00	0.00
37	0.17	0.02	0.00	0.00	0.00	0.00
38	0.12	0.01	0.00	0.00	0.00	0.00
39	0.10	0.01	0.00	0.00	0.00	0.00
40	0.06	0.01	0.00	0.00	0.00	0.00

TABLE 77

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Ti/SILICA
SAMPLE No: 8670+57+27+27

REACTOR LOADING, MLS :	450.0	T, C :	260.6	FEED RATIO,	
CATALYST LOADING, WT%:	17.4	P, PSIG :	300	CO/H2:	1.50
TIME ON STREAM, HRS :	437.2	SV, L/G/HR:	2.00		

USAGE RATIO, CO/H2 :	0.67	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	28.66	MOL SYNGAS/KG CAT/HR:	25.579
%CO CONV. :	19.25	SPECIFIC ACTIVITY,	
%H2 CONV. :	42.75	MOL CO/MOL METAL/MIN:	0.196

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	4.97	H2O:	9.33
OXYGENATES :	0.13	CO :	82.28
CO2 :	0.51	H2 :	2.78

HYDROCARBON SELECTIVITY, WT%:

C1 :	12.31	C4+ENE :	4.23
C2+ANE :	1.87	C5+C11 :	32.27
C2+ENE :	0.84	C12+C18:	25.09
C3+ANE :	0.66	C19+C23:	11.04
C3+ENE :	4.43	C24+34 :	5.50
C4 ISO+ANE:	1.17	C35+ :	0.57

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	32.27
DIESEL (C9+C25) :	47.63

% ELEMENTAL RECOVERY:

CARBON :	90.76
HYDROGEN:	95.61
OXYGEN :	95.71

TABLE 78

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 27

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	12.31	48.49	0.00	0.00	0.00	0.00
2	1.87	3.94	0.84	1.89	0.00	0.00
3	0.66	0.95	4.43	6.65	0.00	0.00
4	1.17	1.28	4.23	4.76	0.00	0.00
5	1.44	1.26	5.15	4.64	0.00	0.00
6	4.07	2.98	3.98	2.98	0.00	0.00
7	2.10	1.32	2.63	1.69	0.15	0.09
8	1.60	0.88	1.59	0.89	0.15	0.08
9	1.32	0.65	1.41	0.70	0.17	0.09
10	1.46	0.65	1.45	0.65	0.38	0.17
11	1.40	0.57	1.27	0.52	0.55	0.22
12	1.83	0.68	1.26	0.47	0.69	0.25
13	1.94	0.66	1.08	0.37	0.47	0.16
14	2.12	0.67	0.87	0.28	0.51	0.16
15	3.01	0.89	0.00	0.00	0.52	0.16
16	3.06	0.85	0.00	0.00	0.54	0.15
17	3.19	0.84	0.17	0.05	0.29	0.08
18	3.27	0.81	0.00	0.00	0.28	0.07
19	2.90	0.68	0.00	0.00	0.14	0.03
20	2.57	0.57	0.00	0.00	0.12	0.03
21	2.22	0.47	0.00	0.00	0.10	0.02
22	1.53	0.31	0.00	0.00	0.13	0.03

TABLE 78 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 27

CARBON NO.	NTALKANES WT %	NTALKANES MOLE %	1TALKENE WT %	1TALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.26	0.24	0.00	0.00	0.08	0.02
24	1.01	0.19	0.00	0.00	0.06	0.01
25	0.98	0.18	0.00	0.00	0.03	0.01
26	0.75	0.13	0.00	0.00	0.02	0.00
27	0.59	0.10	0.00	0.00	0.01	0.00
28	0.46	0.07	0.00	0.00	0.02	0.00
29	0.36	0.06	0.00	0.00	0.02	0.00
30	0.30	0.04	0.00	0.00	0.02	0.00
31	0.27	0.04	0.00	0.00	0.02	0.00
32	0.21	0.03	0.00	0.00	0.01	0.00
33	0.19	0.03	0.00	0.00	0.01	0.00
34	0.17	0.02	0.00	0.00	0.01	0.00
35	0.16	0.02	0.00	0.00	0.01	0.00
36	0.13	0.02	0.00	0.00	0.00	0.00
37	0.10	0.01	0.00	0.00	0.00	0.00
38	0.07	0.01	0.00	0.00	0.00	0.00
39	0.06	0.01	0.00	0.00	0.00	0.00
40	0.04	0.00	0.00	0.00	0.00	0.00

TABLE 79

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Ti/Silica
SAMPLE No: 8670+57+27+30

REACTOR LOADING, MLS :	450.0	T, C :	260.8	FEED RATIO,	
CATALYST LOADING, WT%:	17.4	P, PSIG :	300	CO/H2:	2.03
TIME ON STREAM, HRS :	462.0	SV, L/G/HR:	2.00		

USAGE RATIO, CO/H2 :	0.87	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	22.74	MOL SYNGAS/KG CAT/HR:	20.295
%CO CONV. :	15.79	SPECIFIC ACTIVITY,	
%H2 CONV. :	36.85	MOL CO/MOL METAL/MIN:	0.180

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	4.07	H20:	6.85
OXYGENATES :	0.05	CO :	86.37
CO2 :	0.38	H2 :	2.28

HYDROCARBON SELECTIVITY, WT%:

C1 :	11.64	C4+ENE :	4.20
C2+ANE :	0.83	C5+C11 :	26.05
C2+ENE :	0.88	C12+C18:	26.23
C3+ANE :	0.46	C19+C23:	16.24
C3+ENE :	4.33	C24+34 :	7.56
C4 ISO+ANE:	0.90	C35+ :	0.67

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	26.05
DIESEL (C9+C25) :	54.96

% ELEMENTAL RECOVERY:

CARBON :	92.28
HYDROGEN:	102.58
OXYGEN :	95.11

TABLE 80

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 30

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	11.64	49.89	0.00	0.00	0.00	0.00
2	0.83	1.91	0.88	2.16	0.00	0.00
3	0.46	0.72	4.33	7.07	0.00	0.00
4	0.90	1.06	4.20	5.14	0.00	0.00
5	1.23	1.17	4.86	4.76	0.00	0.00
6	0.00	0.00	4.85	3.96	0.00	0.00
7	1.31	0.90	1.74	1.22	0.12	0.08
8	1.01	0.61	1.42	0.87	0.15	0.09
9	1.11	0.59	1.60	0.87	0.37	0.20
10	1.20	0.58	1.67	0.82	0.45	0.22
11	1.12	0.49	1.32	0.59	0.50	0.22
12	1.45	0.58	1.26	0.51	0.50	0.20
13	1.61	0.60	1.24	0.47	0.29	0.11
14	1.79	0.62	1.22	0.43	0.32	0.11
15	2.50	0.81	0.88	0.29	0.27	0.09
16	3.72	1.13	0.00	0.00	0.27	0.08
17	4.06	1.16	0.00	0.00	0.31	0.09
18	4.20	1.13	0.00	0.00	0.34	0.09
19	3.91	1.00	0.00	0.00	0.16	0.04
20	3.63	0.88	0.00	0.00	0.14	0.03
21	3.21	0.74	0.00	0.00	0.12	0.03
22	2.70	0.60	0.00	0.00	0.11	0.02

TABLE 80 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 30

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	2.17	0.46	0.00	0.00	0.09	0.02
24	1.69	0.34	0.00	0.00	0.06	0.01
25	1.35	0.26	0.00	0.00	0.05	0.01
26	1.02	0.19	0.00	0.00	0.03	0.01
27	0.77	0.14	0.00	0.00	0.03	0.00
28	0.60	0.10	0.00	0.00	0.02	0.00
29	0.46	0.08	0.00	0.00	0.02	0.00
30	0.37	0.06	0.00	0.00	0.03	0.00
31	0.32	0.05	0.00	0.00	0.02	0.00
32	0.26	0.04	0.00	0.00	0.01	0.00
33	0.22	0.03	0.00	0.00	0.02	0.00
34	0.19	0.03	0.00	0.00	0.02	0.00
35	0.18	0.02	0.00	0.00	0.01	0.00
36	0.15	0.02	0.00	0.00	0.00	0.00
37	0.11	0.01	0.00	0.00	0.00	0.00
38	0.09	0.01	0.00	0.00	0.00	0.00
39	0.08	0.01	0.00	0.00	0.00	0.00
40	0.06	0.01	0.00	0.00	0.00	0.00

TABLE 81

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Ti/SILICA
SAMPLE No: 8670+57+27+33

REACTOR LOADING, MLS :	450.0	T, C :	261.3	FEED RATIO,	
CATALYST LOADING, WT%:	17.4	P, PSIG :	300	CO/H2:	2.02
TIME ON STREAM, HRS :	485.4	SV, L/G/HR:	1.00		

USAGE RATIO, CO/H2 :	0.78	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	32.30	MOL SYNGAS/KG CAT/HR:	14.415
%CO CONV. :	21.09	SPECIFIC ACTIVITY,	
%H2 CONV. :	54.99	MOL CO/MOL METAL/MIN:	0.120

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	5.63	H2O:	11.40
OXYGENATES :	0.12	CO :	80.24
CO2 :	1.00	H2 :	1.61

HYDROCARBON SELECTIVITY, WT%:

C1 :	11.04	C4+ENE :	3.95
C2+ANE :	1.13	C5+C11 :	31.21
C2+ENE :	0.72	C12+C18:	24.95
C3+ANE :	0.52	C19+C23:	14.29
C3+ENE :	4.24	C24+34 :	6.61
C4 ISO+ANE:	0.91	C35+ :	0.44

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	31.21
DIESEL (C9+C25) :	55.41

% ELEMENTAL RECOVERY:

CARBON :	90.50
HYDROGEN:	106.06
OXYGEN :	97.68

TABLE 82

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670†5/†27

SAMPLE NO. 33

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	11.04	47.79	0.00	0.00	0.00	0.00
2	1.13	2.60	0.72	1.79	0.00	0.00
3	0.52	0.82	4.24	6.99	0.00	0.00
4	0.91	1.09	3.95	4.89	0.00	0.00
5	1.20	1.15	4.65	4.60	0.00	0.00
6	5.06	4.08	0.14	0.12	0.00	0.00
7	1.72	1.19	1.67	1.18	0.20	0.14
8	1.28	0.78	1.62	1.00	0.38	0.23
9	1.60	0.86	2.12	1.17	0.86	0.47
10	1.68	0.82	2.14	1.06	0.95	0.46
11	1.47	0.65	1.56	0.70	0.91	0.40
12	1.48	0.60	1.30	0.53	0.74	0.30
13	1.75	0.66	1.12	0.43	0.70	0.26
14	1.84	0.65	0.98	0.35	0.46	0.16
15	1.99	0.65	0.91	0.30	0.43	0.14
16	3.07	0.94	0.00	0.00	0.44	0.14
17	3.49	1.01	0.00	0.00	0.39	0.11
18	3.50	0.95	0.00	0.00	0.34	0.09
19	3.35	0.87	0.00	0.00	0.24	0.06
20	3.13	0.77	0.00	0.00	0.11	0.03
21	2.79	0.65	0.00	0.00	0.10	0.02
22	2.38	0.53	0.00	0.00	0.14	0.03

TABLE 82 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 33

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.96	0.42	0.00	0.00	0.08	0.02
24	1.54	0.31	0.00	0.00	0.07	0.01
25	1.23	0.24	0.00	0.00	0.04	0.01
26	0.90	0.17	0.00	0.00	0.03	0.01
27	0.68	0.12	0.00	0.00	0.02	0.00
28	0.51	0.09	0.00	0.00	0.03	0.01
29	0.39	0.07	0.00	0.00	0.02	0.00
30	0.30	0.05	0.00	0.00	0.02	0.00
31	0.26	0.04	0.00	0.00	0.02	0.00
32	0.20	0.03	0.00	0.00	0.02	0.00
33	0.17	0.02	0.00	0.00	0.02	0.00
34	0.14	0.02	0.00	0.00	0.02	0.00
35	0.12	0.02	0.00	0.00	0.01	0.00
36	0.10	0.01	0.00	0.00	0.01	0.00
37	0.07	0.01	0.00	0.00	0.01	0.00
38	0.05	0.01	0.00	0.00	0.00	0.00
39	0.04	0.01	0.00	0.00	0.00	0.00
40	0.02	0.00	0.00	0.00	0.00	0.00

TABLE 83

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Ti/Silica
SAMPLE No: 8670+57+27+38

REACTOR LOADING, MLS :	450.0	T, C :	260.8	FEED RATIO,	
CATALYST LOADING, WT%:	17.4	P, PSIG :	300	CO/H2:	1.50
TIME ON STREAM, HRS :	509.3	SV, L/G/HR:	1.00		

USAGE RATIO, CO/H2 :	0.69	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	34.34	MOL SYNGAS/KG CAT/HR:	15.328
%CO CONV. :	23.28	SPECIFIC ACTIVITY,	
%H2 CONV. :	50.96	MOL CO/MOL METAL/MIN:	0.119

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	7.11	H2O:	11.66
OXYGENATES :	0.15	CO :	77.85
CO2 :	0.85	H2 :	2.37

HYDROCARBON SELECTIVITY, WT%:

C1 :	12.07	C4+ENE :	3.62
C2+ANE :	1.56	C5+C11 :	27.98
C2+ENE :	0.60	C12+C18:	21.26
C3+ANE :	0.68	C19+C23:	13.44
C3+ENE :	3.95	C24+34 :	12.78
C4 ISO+ANE:	1.13	C35+ :	0.92

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	27.98
DIESEL (C9+C25) :	49.60

% ELEMENTAL RECOVERY:

CARBON :	91.12
HYDROGEN:	100.32
OXYGEN :	95.77

TABLE 84

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 38

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	12.07	50.82	0.00	0.00	0.00	0.00
2	1.56	3.50	0.60	1.44	0.00	0.00
3	0.68	1.04	3.95	6.33	0.00	0.00
4	1.13	1.31	3.62	4.35	0.00	0.00
5	1.39	1.30	4.43	4.26	0.00	0.00
6	5.14	4.02	0.08	0.06	0.12	0.10
7	1.96	1.32	1.29	0.89	0.13	0.09
8	1.50	0.89	1.17	0.71	0.15	0.09
9	1.51	0.80	1.44	0.77	0.31	0.16
10	1.74	0.82	1.55	0.74	0.56	0.26
11	1.58	0.68	1.25	0.55	0.68	0.29
12	1.83	0.72	1.10	0.44	0.65	0.26
13	1.80	0.66	0.93	0.34	0.33	0.12
14	1.92	0.65	0.64	0.22	0.35	0.12
15	2.09	0.66	0.46	0.15	0.33	0.11
16	2.77	0.82	0.00	0.00	0.21	0.06
17	2.86	0.80	0.00	0.00	0.21	0.06
18	2.68	0.71	0.00	0.00	0.12	0.03
19	2.70	0.68	0.00	0.00	0.09	0.02
20	2.70	0.64	0.00	0.00	0.09	0.02
21	2.65	0.60	0.00	0.00	0.09	0.02
22	2.55	0.55	0.00	0.00	0.09	0.02

TABLE 84 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 38

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	2.38	0.49	0.00	0.00	0.09	0.02
24	2.17	0.43	0.00	0.00	0.08	0.02
25	1.96	0.37	0.00	0.00	0.07	0.01
26	1.69	0.31	0.00	0.00	0.06	0.01
27	1.43	0.25	0.00	0.00	0.06	0.01
28	1.20	0.20	0.00	0.00	0.05	0.01
29	0.97	0.16	0.00	0.00	0.05	0.01
30	0.84	0.13	0.00	0.00	0.03	0.01
31	0.68	0.10	0.00	0.00	0.05	0.01
32	0.55	0.08	0.00	0.00	0.02	0.00
33	0.43	0.06	0.00	0.00	0.03	0.00
34	0.34	0.05	0.00	0.00	0.03	0.00
35	0.33	0.04	0.00	0.00	0.02	0.00
36	0.19	0.03	0.00	0.00	0.00	0.00
37	0.16	0.02	0.00	0.00	0.01	0.00
38	0.10	0.01	0.00	0.00	0.00	0.00
39	0.07	0.01	0.00	0.00	0.00	0.00
40	0.04	0.01	0.00	0.00	0.00	0.00

TABLE 85

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Ti/Silica
SAMPLE No: 8670+57+27+40

REACTOR LOADING, MLS :	450.0	T, C :	260.0	FEED RATIO,	
CATALYST LOADING, WT%:	17.4	P, PSIG :	300	CO/H2:	1.00
TIME ON STREAM, HRS :	558.1	SV, L/G/HR:	1.00		

USAGE RATIO, CO/H2 :	0.53	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	37.13	MOL SYNGAS/KG CAT/HR:	16.587
%CO CONV. :	25.76	SPECIFIC ACTIVITY,	
%H2 CONV. :	48.50	MOL CO/MOL METAL/MIN:	0.110

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	10.48	H20:	15.73
OXYGENATES :	0.22	CO :	69.14
CO2 :	1.01	H2 :	3.43

HYDROCARBON SELECTIVITY, WT%:

C1 :	14.50	C4+ENE :	3.52
C2+ANE :	1.87	C5+C11 :	35.00
C2+ENE :	0.38	C12+C18:	25.13
C3+ANE :	1.09	C19+C23:	7.77
C3+ENE :	3.86	C24+34 :	4.83
C4 ISO+ANE:	1.68	C35+ :	0.36

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	35.00
DIESEL (C9+C25) :	49.38

% ELEMENTAL RECOVERY:

CARBON :	97.08
HYDROGEN:	104.46
OXYGEN :	102.05

TABLE 86

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 40

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	14.50	53.45	0.00	0.00	0.00	0.00
2	1.87	3.68	0.38	0.79	0.00	0.00
3	1.09	1.47	3.86	5.42	0.00	0.00
4	1.65	1.68	3.52	3.70	0.03	0.03
5	2.14	1.76	4.24	3.57	0.14	0.12
6	6.16	4.23	0.27	0.19	0.00	0.00
7	2.49	1.47	1.40	0.84	0.15	0.09
8	2.03	1.05	1.11	0.58	0.16	0.08
9	2.30	1.06	1.51	0.71	0.39	0.18
10	2.78	1.16	1.84	0.78	0.76	0.32
11	2.85	1.08	1.31	0.50	0.94	0.36
12	2.91	1.01	0.95	0.33	0.67	0.23
13	2.96	0.95	0.59	0.19	0.67	0.21
14	3.28	0.98	0.00	0.00	0.66	0.20
15	3.02	0.84	0.04	0.01	0.55	0.15
16	2.79	0.73	0.06	0.02	0.43	0.11
17	2.71	0.67	0.00	0.00	0.23	0.06
18	2.39	0.55	0.00	0.00	0.22	0.05
19	1.95	0.43	0.00	0.00	0.09	0.02
20	1.66	0.35	0.00	0.00	0.07	0.02
21	1.47	0.29	0.00	0.00	0.06	0.01
22	1.27	0.24	0.00	0.00	0.06	0.01

TABLE 86 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 40

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.08	0.20	0.00	0.00	0.05	0.01
24	0.91	0.16	0.00	0.00	0.04	0.01
25	0.81	0.14	0.00	0.00	0.03	0.00
26	0.63	0.10	0.00	0.00	0.02	0.00
27	0.52	0.08	0.00	0.00	0.02	0.00
28	0.42	0.06	0.00	0.00	0.02	0.00
29	0.34	0.05	0.00	0.00	0.02	0.00
30	0.28	0.04	0.00	0.00	0.02	0.00
31	0.24	0.03	0.00	0.00	0.02	0.00
32	0.19	0.02	0.00	0.00	0.01	0.00
33	0.16	0.02	0.00	0.00	0.01	0.00
34	0.13	0.02	0.00	0.00	0.01	0.00
35	0.10	0.01	0.00	0.00	0.01	0.00
36	0.09	0.01	0.00	0.00	0.00	0.00
37	0.06	0.01	0.00	0.00	0.00	0.00
38	0.04	0.00	0.00	0.00	0.00	0.00
39	0.03	0.00	0.00	0.00	0.00	0.00
40	0.02	0.00	0.00	0.00	0.00	0.00

TABLE 87

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

++

CATALYST : Co/Ti/SILICA
SAMPLE NO: 8670+57+27+42

REACTOR LOADING, MLS :	450.0	T, C :	261.8	FEED RATIO,	
CATALYST LOADING, WT%:	17.4	P, PSIG :	300	CO/H2:	1.00
TIME ON STREAM, HRS :	579.5	SV, L/G/HR:	3.00		

++

USAGE RATIO, CO/H2 :	0.56	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	18.39	MOL SYNGAS/KG CAT/HR:	24.636
%CO CONV. :	13.16	SPECIFIC ACTIVITY,	
%H2 CONV. :	23.62	MOL CO/MOL METAL/MIN:	0.168

++

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	5.80	H2O:	5.14
OXYGENATES :	0.04	CO :	83.46
CO2 :	0.31	H2 :	5.25

++

HYDROCARBON SELECTIVITY, WT%:

C1 :	15.46	C4+ENE :	3.81
C2+ANE :	1.27	C5+C11 :	38.35
C2+ENE :	0.70	C12+C18:	19.42
C3+ANE :	0.82	C19+C23:	8.97
C3+ENE :	4.12	C24+34 :	5.39
C4 ISO+ANE:	1.31	C35+ :	0.37

++

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	38.35
DIESEL (C9+C25) :	40.27

++

% ELEMENTAL RECOVERY:	CARBON :	98.84
	HYDROGEN:	98.79
	OXYGEN :	95.60

++

TABLE 88

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670†57†27

SAMPLE NO. 42

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	15.46	54.41	0.00	0.00	0.00	0.00
2	1.27	2.38	0.70	1.40	0.00	0.00
3	0.82	1.05	4.12	5.53	0.00	0.00
4	1.31	1.27	3.81	3.83	0.00	0.00
5	1.76	1.37	4.30	3.46	0.00	0.00
6	4.13	2.70	6.95	4.66	0.00	0.00
7	2.94	1.66	3.08	1.77	0.74	0.42
8	2.15	1.06	2.21	1.11	0.19	0.10
9	1.68	0.74	1.92	0.86	0.19	0.09
10	1.55	0.61	1.68	0.68	0.20	0.08
11	1.30	0.47	1.06	0.39	0.32	0.12
12	1.43	0.47	0.91	0.31	0.15	0.05
13	1.56	0.48	0.77	0.24	0.18	0.06
14	1.84	0.52	0.60	0.17	0.24	0.07
15	2.49	0.66	0.00	0.00	0.31	0.08
16	2.60	0.65	0.00	0.00	0.41	0.10
17	2.83	0.66	0.00	0.00	0.21	0.05
18	2.66	0.59	0.00	0.00	0.24	0.05
19	2.24	0.47	0.00	0.00	0.11	0.02
20	1.94	0.39	0.00	0.00	0.10	0.02
21	1.69	0.32	0.00	0.00	0.09	0.02
22	1.45	0.26	0.00	0.00	0.07	0.01

TABLE 88 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670†57†27

SAMPLE NO. 42

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	1.22	0.21	0.00	0.00	0.06	0.01
24	1.01	0.17	0.00	0.00	0.05	0.01
25	0.86	0.14	0.00	0.00	0.04	0.01
26	0.70	0.11	0.00	0.00	0.03	0.00
27	0.58	0.09	0.00	0.00	0.03	0.00
28	0.47	0.07	0.00	0.00	0.02	0.00
29	0.38	0.05	0.00	0.00	0.02	0.00
30	0.32	0.04	0.00	0.00	0.01	0.00
31	0.27	0.04	0.00	0.00	0.01	0.00
32	0.22	0.03	0.00	0.00	0.01	0.00
33	0.18	0.02	0.00	0.00	0.01	0.00
34	0.15	0.02	0.00	0.00	0.01	0.00
35	0.13	0.01	0.00	0.00	0.01	0.00
36	0.10	0.01	0.00	0.00	0.00	0.00
37	0.06	0.01	0.00	0.00	0.00	0.00
38	0.04	0.00	0.00	0.00	0.00	0.00
39	0.03	0.00	0.00	0.00	0.00	0.00
40	0.01	0.00	0.00	0.00	0.00	0.00

TABLE 89

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Ti/SILICA
SAMPLE No: 8670+57+27+44

REACTOR LOADING, MLS :	450.0	T, C :	282.5	FEED RATIO,	
CATALYST LOADING, WT%:	17.4	P, PSIG :	300	CO/H2:	1.00
TIME ON STREAM, HRS :	654.0	SV, L/G/HR:	2.00		

USAGE RATIO, CO/H2 :	0.54	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	41.06	MOL SYNGAS/KG CAT/HR:	36.680
%CO CONV. :	28.82	SPECIFIC ACTIVITY,	
%H2 CONV. :	53.29	MOL CO/MOL METAL/MIN:	0.245

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	10.47	H20:	14.22
OXYGENATES :	0.15	CO :	70.44
CO2 :	1.42	H2 :	3.30

HYDROCARBON SELECTIVITY, WT%:

C1 :	23.48	C4+ENE :	4.62
C2+ANE :	2.96	C5+C11 :	34.30
C2+ENE :	0.62	C12+C18:	15.25
C3+ANE :	1.40	C19+C23:	6.03
C3+ENE :	5.64	C24+34 :	3.41
C4 ISO+ANE:	2.02	C35+ :	0.28

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	34.30
DIESEL (C9+C25) :	34.31

% ELEMENTAL RECOVERY:

CARBON :	92.61
HYDROGEN:	95.42
OXYGEN :	95.46

TABLE 90

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 44

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	23.48	63.15	0.00	0.00	0.00	0.00
2	2.96	4.25	0.62	0.95	0.00	0.00
3	1.40	1.37	5.64	5.78	0.00	0.00
4	1.99	1.47	4.62	3.55	0.04	0.03
5	2.31	1.38	5.14	3.16	0.19	0.11
6	6.02	3.01	0.28	0.14	0.00	0.00
7	2.61	1.12	1.38	0.61	0.47	0.20
8	2.03	0.76	1.47	0.57	0.61	0.23
9	1.97	0.66	1.65	0.56	0.79	0.27
10	1.86	0.56	1.37	0.42	0.91	0.28
11	1.70	0.47	0.88	0.25	0.70	0.19
12	1.61	0.41	0.65	0.17	0.40	0.10
13	1.53	0.36	0.48	0.11	0.34	0.08
14	1.51	0.33	0.34	0.07	0.30	0.07
15	1.76	0.36	0.00	0.00	0.27	0.06
16	1.77	0.34	0.00	0.00	0.27	0.05
17	1.79	0.32	0.03	0.01	0.25	0.04
18	1.65	0.28	0.02	0.00	0.24	0.04
19	1.51	0.24	0.00	0.00	0.17	0.03
20	1.34	0.21	0.00	0.00	0.09	0.01
21	1.08	0.16	0.00	0.00	0.11	0.02
22	0.90	0.12	0.00	0.00	0.08	0.01

TABLE 90 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670†57†27

SAMPLE NO. 44

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.68	0.09	0.00	0.00	0.07	0.01
24	0.62	0.08	0.00	0.00	0.04	0.00
25	0.53	0.06	0.00	0.00	0.03	0.00
26	0.44	0.05	0.00	0.00	0.02	0.00
27	0.36	0.04	0.00	0.00	0.02	0.00
28	0.30	0.03	0.00	0.00	0.02	0.00
29	0.25	0.03	0.00	0.00	0.01	0.00
30	0.21	0.02	0.00	0.00	0.01	0.00
31	0.18	0.02	0.00	0.00	0.01	0.00
32	0.14	0.01	0.00	0.00	0.01	0.00
33	0.12	0.01	0.00	0.00	0.00	0.00
34	0.10	0.01	0.00	0.00	0.00	0.00
35	0.09	0.01	0.00	0.00	0.00	0.00
36	0.07	0.01	0.00	0.00	0.00	0.00
37	0.05	0.00	0.00	0.00	0.00	0.00
38	0.03	0.00	0.00	0.00	0.00	0.00
39	0.02	0.00	0.00	0.00	0.00	0.00
40	0.02	0.00	0.00	0.00	0.00	0.00

Table 91

Mass Balance
Process Conditions and Product Summary

++

Catalyst : Co/Ti/Silica
Sample No: 8670+57+27+47

Reactor Loading, mls :	450.0	T, C :	279.8	Feed Ratio,	
Catalyst Loading, wt%:	17.4	P, psig :	300	CO/H2:	1.00
Time on Stream, hrs :	766.3	SV, L/g/hr:	3.00		

++

Usage Ratio, CO/H2 :	0.53	Bulk Activity,	
%Overall Conv., CO+H2:	30.10	mol syngas/kg cat/hr:	40.321
%CO Conv. :	20.88	Specific Activity,	
%H2 Conv. :	39.31	mol CO/mol metal/min:	0.267

++

Weight % Product Distribution:

Hydrocarbons:	7.42	H2O:	10.98
Oxygenates :	0.08	CO :	76.59
CO2 :	0.73	H2 :	4.20

++

Hydrocarbon Selectivity, wt%:

C1 :	24.60	C4+ene :	5.11
C2+ane :	2.90	C5+C11 :	34.18
C2+ene :	0.81	C12+C18:	14.12
C3+ane :	1.21	C19+C23:	6.41
C3+ene :	5.94	C24+34 :	2.65
C4 iso+ane:	1.98	C35+ :	0.09

++

Fuel Fractions, wt%:

Gasoline (C5+C11):	34.18
Diesel (C9+C25) :	31.49

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% Elemental Recovery:	Carbon :	94.41
	Hydrogen:	97.47
	Oxygen :	97.78

++

TABLE 92

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 47

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	24.60	63.74	0.00	0.00	0.00	0.00
2	2.90	4.01	0.81	1.20	0.00	0.00
3	1.21	1.14	5.94	5.86	0.00	0.00
4	1.90	1.36	5.11	3.78	0.08	0.06
5	2.11	1.21	5.80	3.44	0.00	0.00
6	7.41	3.57	0.20	0.10	0.22	0.11
7	2.86	1.19	1.74	0.74	0.35	0.15
8	1.90	0.69	1.50	0.56	0.40	0.15
9	1.64	0.53	1.51	0.50	0.53	0.17
10	1.51	0.44	1.24	0.37	0.66	0.19
11	1.32	0.35	0.76	0.21	0.51	0.14
12	1.34	0.33	0.64	0.16	0.36	0.09
13	1.36	0.31	0.49	0.11	0.36	0.08
14	1.37	0.29	0.34	0.07	0.34	0.07
15	1.61	0.32	0.00	0.00	0.32	0.06
16	1.55	0.28	0.02	0.00	0.31	0.06
17	1.58	0.27	0.05	0.01	0.27	0.05
18	1.50	0.24	0.00	0.00	0.31	0.05
19	1.41	0.22	0.00	0.00	0.20	0.03
20	1.28	0.19	0.00	0.00	0.18	0.03
21	1.13	0.16	0.00	0.00	0.17	0.02
22	0.97	0.13	0.00	0.00	0.14	0.02

TABLE 92 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 47

CARBON NO.	N+ALKANES		1+ALKENE		BRANCHED ISOMERS	
	WT %	MOLE %	WT %	MOLE %	WT %	MOLE %
23	0.80	0.10	0.00	0.00	0.11	0.01
24	0.64	0.08	0.00	0.00	0.09	0.01
25	0.50	0.06	0.00	0.00	0.06	0.01
26	0.36	0.04	0.00	0.00	0.04	0.00
27	0.27	0.03	0.00	0.00	0.02	0.00
28	0.19	0.02	0.00	0.00	0.01	0.00
29	0.14	0.01	0.00	0.00	0.01	0.00
30	0.10	0.01	0.00	0.00	0.01	0.00
31	0.07	0.01	0.00	0.00	0.01	0.00
32	0.05	0.00	0.00	0.00	0.00	0.00
33	0.04	0.00	0.00	0.00	0.00	0.00
34	0.03	0.00	0.00	0.00	0.00	0.00
35	0.02	0.00	0.00	0.00	0.00	0.00
36	0.02	0.00	0.00	0.00	0.00	0.00
37	0.01	0.00	0.00	0.00	0.00	0.00
38	0.01	0.00	0.00	0.00	0.00	0.00
39	0.01	0.00	0.00	0.00	0.00	0.00
40	0.01	0.00	0.00	0.00	0.00	0.00

TABLE 93

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Ti/SILICA
SAMPLE No: 8670+57+27+50

REACTOR LOADING, MLS :	450.0	T, C :	240.2	FEED RATIO,	
CATALYST LOADING, WT%:	17.4	P, PSIG :	300	CO/H2:	1.00
TIME ON STREAM, HRS :	701.4	SV, L/G/HR:	2.00		

USAGE RATIO, CO/H2 :	0.70	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	12.62	MOL SYNGAS/KG CAT/HR:	11.278
%CO CONV. :	10.39	SPECIFIC ACTIVITY,	
%H2 CONV. :	14.86	MOL CO/MOL METAL/MIN:	0.088

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	2.29	H2O:	3.80
OXYGENATES :	0.02	CO :	87.77
CO2 :	0.16	H2 :	5.96

HYDROCARBON SELECTIVITY, WT%:

C1 :	17.86	C4+ENE :	4.38
C2+ANE :	0.68	C5+C11 :	34.78
C2+ENE :	1.15	C12+C18:	13.33
C3+ANE :	0.84	C19+C23:	13.57
C3+ENE :	4.96	C24+34 :	6.68
C4 ISO+ANE:	1.58	C35+ :	0.21

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	34.78
DIESEL (C9+C25) :	35.67

% ELEMENTAL RECOVERY:

CARBON :	94.27
HYDROGEN:	96.73
OXYGEN :	95.87

TABLE 94

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670+57+27

SAMPLE NO. 50

CARBON NO.	n-ALKANES WT %	n-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	17.86	57.97	0.00	0.00	0.00	0.00
2	0.68	1.18	1.15	2.13	0.00	0.00
3	0.84	0.99	4.96	6.13	0.00	0.00
4	1.58	1.41	4.38	4.06	0.00	0.00
5	1.54	1.11	5.33	3.95	0.00	0.00
6	11.59	7.00	0.00	0.00	0.00	0.00
7	3.12	1.62	3.51	1.86	0.16	0.08
8	1.82	0.83	2.10	0.97	0.12	0.05
9	1.18	0.48	1.35	0.56	0.08	0.03
10	0.83	0.30	1.01	0.38	0.10	0.04
11	0.44	0.15	0.42	0.14	0.07	0.02
12	0.53	0.16	0.43	0.13	0.06	0.02
13	0.66	0.19	0.43	0.12	0.10	0.03
14	0.86	0.23	0.40	0.11	0.16	0.04
15	1.34	0.33	0.18	0.04	0.28	0.07
16	1.82	0.42	0.07	0.02	0.31	0.07
17	2.47	0.53	0.07	0.01	0.36	0.08
18	2.46	0.50	0.00	0.00	0.34	0.07
19	2.81	0.55	0.00	0.00	0.21	0.04
20	2.56	0.47	0.00	0.00	0.25	0.05
21	2.62	0.46	0.00	0.00	0.22	0.04
22	2.37	0.40	0.00	0.00	0.25	0.04

TABLE 94 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8670t57t27

SAMPLE NO. 50

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	2.07	0.33	0.00	0.00	0.21	0.03
24	1.68	0.26	0.00	0.00	0.18	0.03
25	1.31	0.19	0.00	0.00	0.12	0.02
26	0.95	0.13	0.00	0.00	0.08	0.01
27	0.71	0.10	0.00	0.00	0.05	0.01
28	0.49	0.07	0.00	0.00	0.03	0.00
29	0.33	0.04	0.00	0.00	0.03	0.00
30	0.22	0.03	0.00	0.00	0.02	0.00
31	0.17	0.02	0.00	0.00	0.02	0.00
32	0.11	0.01	0.00	0.00	0.01	0.00
33	0.08	0.01	0.00	0.00	0.01	0.00
34	0.07	0.01	0.00	0.00	0.01	0.00
35	0.04	0.00	0.00	0.00	0.01	0.00
36	0.06	0.01	0.00	0.00	0.01	0.00
37	0.03	0.00	0.00	0.00	0.00	0.00
38	0.02	0.00	0.00	0.00	0.01	0.00
39	0.02	0.00	0.00	0.00	0.00	0.00
40	0.01	0.00	0.00	0.00	0.00	0.00

TABLE 95

Extended Slurry Test Summary

8862-1-31

21.1 wt% (91.4g) $Co_2(CO)_8/Zr(OPr^i)_4/SiO_2$

Sample No.	Time on Stream h	P psig	T °C	Space Velocity l/g/hr	%X CO+H_2	%X CO	%X H_2	Feed CO/H_2	Usage $\Delta CO/\Delta H_2$	Bulk Activity mol syngas/ kg cat/h	Specific Activity mol CO/ mol metal/min	Selectivity Wt% C_1	C_2-C_4	C_5-C_{11}	C_{12}-C_{18}	C_{19}-C_{23}	C_{24}^+	C_5-C_{23}
3	21	305	241	1.8	65.6	62.1	67.3	0.50	0.46	52.7	0.310	19.2	24.2	38.4	13.4	2.6	2.2	54.4
6	68	305	242	1.7	65.8	63.2	67.1	0.52	0.49	52.9	0.323	20.6	26.7	38.0	10.7	2.5	1.4	51.2
9	116	300	244	1.8	66.1	63.9	67.3	0.51	0.48	53.2	0.323	22.2	26.6	36.8	10.2	2.8	1.3	49.8
11	166	305	243	1.8	65.6	63.0	67.0	0.50	0.47	52.7	0.315	20.6	24.7	37.1	11.8	3.9	1.9	52.8
14	262	305	241	1.8	52.1	48.0	54.0	0.47	0.42	41.9	0.232	18.0	26.6	40.0	11.2	2.9	1.4	54.1
-	359	310	241	1.8	59.0	55.7	60.5	0.50	0.46	47.4	0.276	N	O	M	A	S	S	B A L A N C E

TABLE 96

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/Silica/EXTENDED TES
SAMPLE No: 8862+1+31+3

REACTOR LOADING, MLS :	450.0	T, C :	241.0	FEED RATIO,	
CATALYST LOADING, WT%:	21.1	P, PSIG :	305	CO/H2:	0.50
TIME ON STREAM, HRS :	21.0	SV, L/G/HR:	1.80		

USAGE RATIO, CO/H2 :	0.46	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	65.57	MOL SYNGAS/KG CAT/HR:	52.659
%CO CONV. :	62.11	SPECIFIC ACTIVITY,	
%H2 CONV. :	67.30	MOL CO/MOL METAL/MIN:	0.310

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	26.65	H2O:	30.69
OXYGENATES :	1.17	CO :	32.32
CO2 :	5.18	H2 :	3.98

HYDROCARBON SELECTIVITY, WT%:

C1 :	19.19	C4+ENE :	1.71
C2+ANE :	4.05	C5+C11 :	38.40
C2+ENE :	0.00	C12+C18:	13.38
C3+ANE :	8.35	C19+C23:	2.57
C3+ENE :	1.43	C24+34 :	2.02
C4 ISO+ANE:	8.69	C35+ :	0.21

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	38.40
DIESEL (C9+C25) :	28.29

% ELEMENTAL RECOVERY:

CARBON :	103.07
HYDROGEN:	101.17
OXYGEN :	102.58

TABLE 97

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8862+1+31

SAMPLE NO. 3

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	19.19	54.15	0.00	0.00	0.00	0.00
2	4.05	6.10	0.00	0.00	0.00	0.00
3	8.35	8.57	1.43	1.54	0.00	0.00
4	8.55	6.65	1.71	1.38	0.14	0.11
5	7.86	4.93	1.25	0.81	0.48	0.30
6	7.42	3.90	0.05	0.03	0.00	0.00
7	4.64	2.10	0.30	0.14	0.10	0.04
8	3.81	1.51	0.00	0.00	0.61	0.24
9	4.01	1.42	0.08	0.03	0.60	0.21
10	3.53	1.12	0.00	0.00	0.52	0.17
11	2.70	0.78	0.00	0.00	0.44	0.13
12	2.43	0.64	0.00	0.00	0.38	0.10
13	2.16	0.53	0.00	0.00	0.30	0.07
14	1.91	0.44	0.00	0.00	0.25	0.06
15	1.65	0.35	0.00	0.00	0.16	0.04
16	1.42	0.28	0.00	0.00	0.23	0.05
17	1.20	0.23	0.00	0.00	0.27	0.05
18	0.91	0.16	0.00	0.00	0.11	0.02
19	0.71	0.12	0.00	0.00	0.09	0.02
20	0.56	0.09	0.00	0.00	0.06	0.01
21	0.43	0.07	0.00	0.00	0.03	0.00
22	0.35	0.05	0.00	0.00	0.03	0.00

TABLE 97 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8862+1+31

SAMPLE NO. 3

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.28	0.04	0.00	0.00	0.03	0.00
24	0.22	0.03	0.00	0.00	0.02	0.00
25	0.21	0.03	0.00	0.00	0.00	0.00
26	0.20	0.02	0.00	0.00	0.00	0.00
27	0.20	0.02	0.00	0.00	0.00	0.00
28	0.19	0.02	0.00	0.00	0.00	0.00
29	0.18	0.02	0.00	0.00	0.00	0.00
30	0.17	0.02	0.00	0.00	0.00	0.00
31	0.17	0.02	0.00	0.00	0.00	0.00
32	0.16	0.02	0.00	0.00	0.00	0.00
33	0.16	0.02	0.00	0.00	0.00	0.00
34	0.15	0.01	0.00	0.00	0.00	0.00
35	0.14	0.01	0.00	0.00	0.00	0.00
36	0.06	0.01	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 98

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/SILICA/EXTENDED TES
SAMPLE No: 8862+1+31+6

REACTOR LOADING, MLS :	450.0	T, C :	242.0	FEED RATIO,	
CATALYST LOADING, WT%:	21.1	P, PSIG :	305	CO/H2:	0.52
TIME ON STREAM, HRS :	94.0	SV, L/G/HR:	1.80		

USAGE RATIO, CO/H2 :	0.49	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	65.77	MOL SYNGAS/KG CAT/HR:	52.868
%CO CONV. :	63.23	SPECIFIC ACTIVITY,	
%H2 CONV. :	67.08	MOL CO/MOL METAL/MIN:	0.323

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	25.43	H20:	32.14
OXYGENATES :	1.40	CO :	32.62
CO2 :	4.37	H2 :	4.05

HYDROCARBON SELECTIVITY, WT%:

C1 :	20.64	C4+ENE :	1.98
C2+ANE :	4.54	C5+C11 :	38.01
C2+ENE :	0.00	C12+C18:	10.70
C3+ANE :	8.87	C19+C23:	2.54
C3+ENE :	1.54	C24+34 :	1.25
C4 ISO+ANE:	9.74	C35+ :	0.20

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	38.01
DIESEL (C9+C25) :	24.58

% ELEMENTAL RECOVERY:

CARBON :	96.35
HYDROGEN:	100.96
OXYGEN :	100.55

TABLE 99

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8862†1†31

SAMPLE NO. 6

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	20.64	54.96	0.00	0.00	0.00	0.00
2	4.54	6.44	0.00	0.00	0.00	0.00
3	8.87	8.59	1.54	1.56	0.00	0.00
4	9.58	7.04	1.98	1.51	0.16	0.11
5	8.66	5.13	1.44	0.88	0.58	0.34
6	7.26	3.60	0.00	0.00	0.00	0.00
7	4.44	1.89	0.42	0.18	0.03	0.01
8	3.62	1.35	0.00	0.00	0.64	0.24
9	3.95	1.32	0.00	0.00	0.71	0.24
10	3.12	0.94	0.00	0.00	0.56	0.17
11	2.17	0.59	0.00	0.00	0.41	0.11
12	1.87	0.47	0.00	0.00	0.36	0.09
13	1.65	0.38	0.00	0.00	0.29	0.07
14	1.45	0.31	0.00	0.00	0.23	0.05
15	1.27	0.26	0.00	0.00	0.18	0.04
16	1.14	0.21	0.00	0.00	0.14	0.03
17	1.02	0.18	0.00	0.00	0.12	0.02
18	0.89	0.15	0.00	0.00	0.09	0.02
19	0.73	0.12	0.00	0.00	0.08	0.01
20	0.57	0.09	0.00	0.00	0.06	0.01
21	0.43	0.06	0.00	0.00	0.04	0.01
22	0.33	0.05	0.00	0.00	0.03	0.00

TABLE 99 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8852+1+31

SAMPLE NO. 6

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.26	0.03	0.00	0.00	0.02	0.00
24	0.21	0.03	0.00	0.00	0.01	0.00
25	0.18	0.02	0.00	0.00	0.01	0.00
26	0.15	0.02	0.00	0.00	0.00	0.00
27	0.12	0.01	0.00	0.00	0.00	0.00
28	0.12	0.01	0.00	0.00	0.00	0.00
29	0.06	0.01	0.00	0.00	0.00	0.00
30	0.07	0.01	0.00	0.00	0.01	0.00
31	0.07	0.01	0.00	0.00	0.02	0.00
32	0.05	0.00	0.00	0.00	0.01	0.00
33	0.05	0.00	0.00	0.00	0.02	0.00
34	0.07	0.01	0.00	0.00	0.02	0.00
35	0.07	0.01	0.00	0.00	0.00	0.00
36	0.05	0.00	0.00	0.00	0.00	0.00
37	0.04	0.00	0.00	0.00	0.00	0.00
38	0.01	0.00	0.00	0.00	0.00	0.00
39	0.01	0.00	0.00	0.00	0.00	0.00
40	0.01	0.00	0.00	0.00	0.00	0.00

TABLE 100

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/Silica/EXTENDED TES
SAMPLE NO: 8862-1-31-9

REACTOR LOADING, MLS :	450.0	T, C :	244.0	FEED RATIO,	
CATALYST LOADING, WT%:	21:1	P, PSIG :	300	CO/H2:	0.51
TIME ON STREAM, HRS :	118.0	SV, L/G/HR:	1.80		

USAGE RATIO, CO/H2 :	0.48	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	66.14	MOL SYNGAS/KG CAT/HR:	53.170
%CO CONV. :	63.91	SPECIFIC ACTIVITY,	
%H2 CONV. :	67.28	MOL CO/MOL METAL/MIN:	0.323

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	24.96	H2O:	32.48
OXYGENATES :	1.37	CO :	32.05
CO2 :	5.06	H2 :	4.08

HYDROCARBON SELECTIVITY, WT%:

C1 :	22.23	C4+ENE :	1.90
C2+ANE :	4.93	C5+C11 :	36.82
C2+ENE :	0.00	C12+C18:	10.22
C3+ANE :	8.99	C19+C23:	2.75
C3+ENE :	1.46	C24+34 :	1.16
C4 ISO+ANE:	9.37	C35+ :	0.18

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	36.82
DIESEL (C9+C25) :	23.55

% ELEMENTAL RECOVERY:

CARBON :	94.94
HYDROGEN:	99.71
OXYGEN :	101.37

TABLE 101

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8862†1†31

SAMPLE NO. 9

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	22.23	56.96	0.00	0.00	0.00	0.00
2	4.93	6.73	0.00	0.00	0.00	0.00
3	8.99	8.38	1.46	1.43	0.00	0.00
4	9.21	6.51	1.90	1.39	0.16	0.11
5	8.24	4.69	1.40	0.82	0.57	0.32
6	7.38	3.52	0.00	0.00	0.00	0.00
7	4.45	1.83	0.00	0.00	0.48	0.20
8	3.38	1.22	0.00	0.00	0.75	0.27
9	3.59	1.15	0.00	0.00	0.75	0.24
10	2.91	0.84	0.00	0.00	0.53	0.15
11	1.99	0.52	0.00	0.00	0.40	0.10
12	1.73	0.42	0.00	0.00	0.34	0.08
13	1.53	0.34	0.00	0.00	0.28	0.06
14	1.36	0.28	0.00	0.00	0.22	0.05
15	1.21	0.23	0.00	0.00	0.17	0.03
16	1.09	0.20	0.00	0.00	0.15	0.03
17	1.00	0.17	0.00	0.00	0.13	0.02
18	0.91	0.15	0.00	0.00	0.10	0.02
19	0.81	0.12	0.00	0.00	0.09	0.01
20	0.63	0.09	0.00	0.00	0.06	0.01
21	0.47	0.07	0.00	0.00	0.04	0.01
22	0.35	0.05	0.00	0.00	0.03	0.00

TABLE 101 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8862-1-31

SAMPLE NO. 9

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.26	0.03	0.00	0.00	0.01	0.00
24	0.22	0.03	0.00	0.00	0.01	0.00
25	0.18	0.02	0.00	0.00	0.00	0.00
26	0.13	0.02	0.00	0.00	0.00	0.00
27	0.08	0.01	0.00	0.00	0.00	0.00
28	0.12	0.01	0.00	0.00	0.00	0.00
29	0.08	0.01	0.00	0.00	0.00	0.00
30	0.08	0.01	0.00	0.00	0.00	0.00
31	0.06	0.01	0.00	0.00	0.00	0.00
32	0.05	0.00	0.00	0.00	0.00	0.00
33	0.06	0.01	0.00	0.00	0.00	0.00
34	0.06	0.01	0.00	0.00	0.00	0.00
35	0.06	0.01	0.00	0.00	0.00	0.00
36	0.05	0.00	0.00	0.00	0.00	0.00
37	0.03	0.00	0.00	0.00	0.00	0.00
38	0.01	0.00	0.00	0.00	0.00	0.00
39	0.01	0.00	0.00	0.00	0.00	0.00
40	0.01	0.00	0.00	0.00	0.00	0.00

TABLE 102

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/SILICA/EXTEND-TEST
SAMPLE No: 8862+1+31+11

REACTOR LOADING, MLS :	450.0	T, C :	243.0	FEED RATIO,	
CATALYST LOADING, WT%:	21.1	P, PSIG :	305	CO/H2:	0.50
TIME ON STREAM, HRS :	166.0	SV, L/G/HR:	1.80		

USAGE RATIO, CO/H2 :	0.47	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	65.62	MOL SYNGAS/KG CAT/HR:	52.695
%CO CONV. :	62.95	SPECIFIC ACTIVITY,	
%H2 CONV. :	66.95	MOL CO/MOL METAL/MIN:	0.315

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	25.04	H2O:	32.52
OXYGENATES :	1.32	CO :	32.52
CO2 :	4.45	H2 :	4.14

HYDROCARBON SELECTIVITY, WT%:

C1 :	20.56	C4+ENE :	1.84
C2+ANE :	4.72	C5+C11 :	37.09
C2+ENE :	0.00	C12+C18:	11.82
C3+ANE :	8.11	C19+C23:	3.93
C3+ENE :	1.45	C24+34 :	1.72
C4 ISO+ANE:	8.60	C35+ :	0.17

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	37.09
DIESEL (C9+C25) :	27.55

% ELEMENTAL RECOVERY:

CARBON :	96.43
HYDROGEN:	99.35
OXYGEN :	102.21

TABLE 103

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8862+1+31

SAMPLE NO. 11

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	20.56	55.80	0.00	0.00	0.00	0.00
2	4.72	6.84	0.00	0.00	0.00	0.00
3	8.11	8.00	1.45	1.50	0.00	0.00
4	8.46	6.33	1.84	1.42	0.14	0.11
5	7.77	4.69	1.35	0.83	0.56	0.34
6	6.79	3.43	0.00	0.00	0.14	0.07
7	4.47	1.94	0.00	0.00	0.35	0.15
8	3.82	1.46	0.00	0.00	0.61	0.23
9	4.05	1.38	0.00	0.00	0.67	0.23
10	3.34	1.02	0.00	0.00	0.46	0.14
11	2.34	0.65	0.00	0.00	0.36	0.10
12	2.01	0.51	0.00	0.00	0.31	0.08
13	1.73	0.41	0.00	0.00	0.26	0.06
14	1.50	0.33	0.00	0.00	0.23	0.05
15	1.31	0.27	0.00	0.00	0.20	0.04
16	1.23	0.24	0.00	0.00	0.19	0.04
17	1.13	0.21	0.00	0.00	0.30	0.05
18	1.10	0.19	0.00	0.00	0.30	0.05
19	0.94	0.15	0.00	0.00	0.29	0.05
20	0.85	0.13	0.00	0.00	0.19	0.03
21	0.59	0.09	0.00	0.00	0.06	0.01
22	0.47	0.07	0.00	0.00	0.13	0.02

TABLE 103 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8862-1-31

SAMPLE NO. 11

CARBON NO.	N-ALKANES WT %	N-ALKANES MOLE %	1-ALKENE WT %	1-ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.36	0.05	0.00	0.00	0.03	0.00
24	0.30	0.04	0.00	0.00	0.02	0.00
25	0.25	0.03	0.00	0.00	0.02	0.00
26	0.21	0.02	0.00	0.00	0.02	0.00
27	0.17	0.02	0.00	0.00	0.02	0.00
28	0.14	0.02	0.00	0.00	0.02	0.00
29	0.11	0.01	0.00	0.00	0.01	0.00
30	0.09	0.01	0.00	0.00	0.01	0.00
31	0.09	0.01	0.00	0.00	0.02	0.00
32	0.07	0.01	0.00	0.00	0.02	0.00
33	0.07	0.01	0.00	0.00	0.01	0.00
34	0.07	0.01	0.00	0.00	0.01	0.00
35	0.06	0.01	0.00	0.00	0.00	0.00
36	0.05	0.00	0.00	0.00	0.00	0.00
37	0.04	0.00	0.00	0.00	0.00	0.00
38	0.01	0.00	0.00	0.00	0.00	0.00
39	0.01	0.00	0.00	0.00	0.00	0.00
40	0.01	0.00	0.00	0.00	0.00	0.00

TABLE 104

MASS BALANCE
PROCESS CONDITIONS AND PRODUCT SUMMARY

CATALYST : Co/Zr/Silica/EXTEND.TEST
SAMPLE NO: 8862+1+31+14

REACTOR LOADING, MLS :	450.0	T, C :	241.0	FEED RATIO,	
CATALYST LOADING, WT%:	21.1	P, PSIG :	305	CO/H2:	0.47
TIME-ON STREAM, HRS :	262.0	SV, L/G/HR:	1.80		

USAGE RATIO, CO/H2 :	0.42	BULK ACTIVITY,	
%OVERALL CONV., CO+H2:	52.09	MOL SYNGAS/KG CAT/HR:	41.873
%CO CONV. :	48.03	SPECIFIC ACTIVITY,	
%H2 CONV. :	54.02	MOL CO/MOL METAL/MIN:	0.232

WEIGHT % PRODUCT DISTRIBUTION:

HYDROCARBONS:	20.73	H2O:	28.62
OXYGENATES :	1.17	CO :	42.02
CO2 :	1.88	H2 :	5.59

HYDROCARBON SELECTIVITY, WT%:

C1 :	17.98	C4+ENE :	2.28
C2+ANE :	3.89	C5+C11 :	40.05
C2+ENE :	0.00	C12+C18:	11.16
C3+ANE :	8.62	C19+C23:	2.88
C3+ENE :	2.37	C24+34 :	1.28
C4 ISO+ANE:	9.39	C35+ :	0.10

FUEL FRACTIONS, WT%:

GASOLINE (C5+C11):	40.05
DIESEL (C9+C25) :	27.13

% ELEMENTAL RECOVERY:

CARBON :	104.21
HYDROGEN:	103.62
OXYGEN :	111.01

TABLE 105

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8862†1†31

SAMPLE NO. 14

CARBON NO.	N†ALKANES WT %	N†ALKANES MOLE %	1†ALKENE WT %	1†ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
1	17.98	51.30	0.00	0.00	0.00	0.00
2	3.89	5.92	0.00	0.00	0.00	0.00
3	8.62	8.94	2.37	2.57	0.00	0.00
4	9.25	7.28	2.28	1.86	0.15	0.11
5	8.12	5.15	1.61	1.05	0.53	0.34
6	2.28	1.21	4.65	2.53	0.00	0.00
7	4.90	2.24	0.00	0.00	0.36	0.17
8	4.18	1.68	0.00	0.00	0.79	0.32
9	4.54	1.62	0.00	0.00	0.85	0.30
10	3.74	1.20	0.00	0.00	0.60	0.19
11	2.47	0.72	0.00	0.00	0.42	0.12
12	2.10	0.56	0.00	0.00	0.37	0.10
13	1.79	0.44	0.00	0.00	0.30	0.07
14	1.53	0.35	0.00	0.00	0.23	0.05
15	1.31	0.28	0.00	0.00	0.18	0.04
16	1.13	0.23	0.00	0.00	0.14	0.03
17	0.97	0.19	0.00	0.00	0.12	0.02
18	0.86	0.16	0.00	0.00	0.11	0.02
19	0.77	0.13	0.00	0.00	0.10	0.02
20	0.64	0.10	0.00	0.00	0.07	0.01
21	0.50	0.08	0.00	0.00	0.05	0.01
22	0.38	0.06	0.00	0.00	0.04	0.01

TABLE 105 (CONTINUED)

HYDROCARBON PRODUCT DISTRIBUTION

RUN NO. 8862+1+31

SAMPLE NO. 14

CARBON NO.	N+ALKANES WT %	N+ALKANES MOLE %	1+ALKENE WT %	1+ALKENE MOLE %	BRANCHED ISOMERS WT %	BRANCHED ISOMERS MOLE %
23	0.29	0.04	0.00	0.00	0.02	0.00
24	0.23	0.03	0.00	0.00	0.02	0.00
25	0.20	0.03	0.00	0.00	0.01	0.00
26	0.16	0.02	0.00	0.00	0.01	0.00
27	0.13	0.02	0.00	0.00	0.01	0.00
28	0.11	0.01	0.00	0.00	0.01	0.00
29	0.09	0.01	0.00	0.00	0.01	0.00
30	0.07	0.01	0.00	0.00	0.01	0.00
31	0.06	0.01	0.00	0.00	0.01	0.00
32	0.05	0.00	0.00	0.00	0.01	0.00
33	0.04	0.00	0.00	0.00	0.01	0.00
34	0.04	0.00	0.00	0.00	0.01	0.00
35	0.03	0.00	0.00	0.00	0.00	0.00
36	0.03	0.00	0.00	0.00	0.00	0.00
37	0.02	0.00	0.00	0.00	0.00	0.00
38	0.01	0.00	0.00	0.00	0.00	0.00
39	0.01	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00