

APPENDIX D

DETAILED DATA OBTAINED WITH DEVELOPMENTAL  
CATALYSTS SG-B-3 AND SGF-B-1

TABLE D1

AGING OF CATALYST SG-B-3 AT 200 PSIG WITH H<sub>2</sub>/CO

(Pretreatment: H<sub>2</sub>, 16 Hrs. @ 600°F and 200 psig)

	1	2	3	4	5	6	7	8	9	10
Run CT 159-139	0.8	1.8	2.8	4.8	6.0	7.9	8.8	9.8	11.8	12.9
Days On-Stream	466	470	463	472	463	473	473	494	498	497
Temperature, Inlet, °F	473	474	474	474	475	475	475	498	500	502
Average, °F	482	487	487	487	485	487	486	517	516	517
Maximum, °F	455	460	460	462	463	463	463	483	485	488
Outlet, °F	527	546	541	540	541	541	544	539	533	524
GHSV	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
WHSV	55.1	52.9	53.3	53.5	53.3	53.3	53.1	52.0	52.6	53.4
Contact Time, sec.	96	99	99	100	100	103	99	97	97	100
Material Balance, % wt.	37	39	35	35	33	31	32	42	38	40
CO Conversion, % wt.	99	99	99	99	99	98	99	98	97	97
To HC, % wt.	78	79	78	77	72	74	69	86	82	83
H <sub>2</sub> Conversion, % wt.	47	48	52	55	52	58	52	52	57	52
To HC, % wt.										
Total Conversion, % wt.	40	41	38	38	36	34	34	45	41	43
gm HC/m <sup>3</sup> CO	176	202	191	198	181	181	168	231	233	213
gm C <sub>3</sub> + HC/gm Catalyst/Hr	0.088	0.107	0.099	0.101	0.091	0.089	0.085	0.114	0.110	0.094
HC Selectivity, % wt.										
C <sub>1</sub>	15	14	15	16	17	18	18	20	21	25
C <sub>2</sub>	3	2	2	2	2	3	2	2	3	3
C <sub>3</sub>	4	5	5	4	5	6	5	5	4	5
C <sub>4</sub>	6	7	7	6	7	8	7	7	10	9
C <sub>5</sub>	10	9	9	10	9	8	10	10	11	10
C <sub>5+</sub>	62	64	61	61	60	57	58	55	50	48
Olefin Selectivity, % wt.										
C <sub>2</sub>	33	25	40	20	25	20	25	29	25	14
C <sub>3</sub>	77	75	75	79	72	73	77	69	71	66
C <sub>4</sub>	77	81	81	79	81	82	80	79	79	75
C <sub>5</sub>	85	85	85	86	85	85	85	91	84	84
C <sub>5</sub> Olefin Selectivity										
1-Pentene	5	6	6	7	7	8	7	4	4	3
2-Pentene	37	50	59	55	58	60	57	35	30	28
Methylbutenes	58	43	35	38	35	32	36	60	66	69
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt.	3	1	0	0	0	0	0	0	0	0
90% OH, °F	463	504	500	500	503	495	500	455	450	390

TABLE D2

## SYNTHESIS GAS CONVERSION OVER CATALYST SG-B-3

(Pretreatment: H<sub>2</sub>, 16 Hrs @ 600°F and 200 psig)

Run	CT-143	64-2	64-3
Catalyst	SG-	B-3	B-3
Temp., Inlet	°F	494	495
	Avg.	506	504
	Max.	516	514
	Outlet	487	487
	GHSV	1001	1009
	WHSV	1.4	1.4
Contact Time, sec.		26.7	26.5
Material Balance, %		106	102
CO Conv.	% wt.	37	36
	to HC	99	99
H <sub>2</sub> Conv.	% wt.	79	76
	to HC	60	59
Total Conv.	% wt.	40	39
G HC/m <sup>3</sup> CO		224	217
HC Selectivity, % wt.			
	C <sub>1</sub>	19	20
	C <sub>2</sub>	2	2
	C <sub>3</sub>	5	5
	C <sub>4</sub>	9	8
	C <sub>5</sub>	12	11
	C <sub>6</sub> <sup>+</sup>	53	53
Olefin Selectivity, % wt.			
	C <sub>2</sub>	32	32
	C <sub>3</sub>	66	68
	C <sub>4</sub>	80	79
	C <sub>5</sub>	85	85
C <sub>5</sub> Olefin Selectivity, % wt.			
	1-pentene	4	4
	2-pentene	31	35
	Methylbutenes	65	61
C <sub>6</sub> <sup>+</sup> Aromatics, % wt.		1	1
	90% OH, °F	366	396

TABLE D3

SYNTHESIS GAS CONVERSION OVER CATALYST SG-B-3  
EFFECT OF TEMPERATURE

(Pretreatment: H<sub>2</sub>, 16 Hrs @ 600°F and 200 psig)

Run	CT-143	67-1	65-1	66-1	65.3
Catalyst	SG-B-3	—————→			
Charge (mole)	H <sub>2</sub> /CO/CO <sub>2</sub> /CH <sub>4</sub>	0.9/1.0/0.3/3.1 —————→			
Temp., Inlet	°F	460	480	499	518
	Avg. °F	457	483	501	518
	Max. °F	460	485	508	525
	Outlet °F	449	473	490	508
Pressure,	PSIG	200	200	200	200
	GHSV	1039	1047	1057	1063
	WHSV	1.8	1.8	1.8	1.9
Contact Time,	sec.	25.7	25.5	25.2	25.1
Material Balance,	%	100	102	98	104
CO Conv.	% Wt.	27	29	32	32
to HC	% Wt.	98	98	97	94
H <sub>2</sub> Conv.	% Wt.	66	75	85	80
to HC	% Wt.	56	52	57	56
Total Conv.	% Wt.	29	32	35	35
G HC/m <sup>3</sup> CO		185	180	210	202
HC Selectivity,	% Wt.				
	C <sub>1</sub>	25	9	26	27
	C <sub>2</sub>	12	14	12	14
	C <sub>3</sub>	4	6	5	7
	C <sub>4</sub>	9	13	11	12
	C <sub>5</sub>	9	10	8	6
	C <sub>5+</sub>	42	48	38	34
Olefin Selectivity,	% Wt.				
	C <sub>2</sub>	17	14	14	12
	C <sub>3</sub>	50	67	33	50
	C <sub>4</sub>	76	69	51	51
	C <sub>5</sub>	87	80	72	71
C <sub>5</sub> Olefin Selectivity,	% Wt.				
	1-pentene	2	1	1	1
	2-pentene	17	16	15	16
	Methylbutenes	81	83	84	83
C <sub>6+</sub> Aromatics,	% Wt.	6	6	9	9
90% OH,	°F	368	365	367	341

TABLE D4

PROCESSING H<sub>2</sub>/CO OVER SG-B-3 AFTER  
950°F HYDROGEN PRETREATMENT

Run CT-159-141-	1	2	3	4	5
Days On-Stream	0.9	1.9	3.8	4.8	5.8
Temperature, Inlet, °F	492	496	476	476	476
Average, °F	493	500	476	476	477
Maximum, °F	513	515	486	487	487
Outlet, °F	476	482	465	465	466
Pressure, psig	200	200	200	200	205
GHSV	494	527	531	533	531
WHSV	0.7	0.8	0.8	0.8	0.8
Contact Time, sec.	56.9	53.2	54.6	54.7	55.6
Material Balance, % wt.	98	98	99	98	99
CO Conversion, % wt.	41	40	28	28	29
To HC, % wt.	98	98	100	99	99
H <sub>2</sub> Conversion, % wt.	84	83	63	62	61
To HC, % wt.	50	52	54	50	53
Total Conversion, % wt.	44	43	30	30	31
gm HC/m <sup>3</sup> CO	210	222	156	140	160
gm C <sub>3</sub> <sup>+</sup> HC/gm Catalyst/Hr	0.095	0.107	0.074	0.064	0.078
HC Selectivity, % wt.					
C <sub>1</sub>	19	20	20	22	18
C <sub>2</sub>	2	2	3	3	3
C <sub>3</sub>	3	3	3	6	4
C <sub>4</sub>	8	8	4	9	14
C <sub>5</sub>	12	12	13	12	16
C <sub>6</sub> <sup>+</sup>	56	56	58	49	44
Olefin Selectivity, % wt.					
C <sub>2</sub>	17	17	40	25	0
C <sub>3</sub>	43	50	27	67	99
C <sub>4</sub>	65	68	83	80	48
C <sub>5</sub>	77	80	84	85	85
C <sub>5</sub> Olefin Selectivity					
1-Pentene	2	2	4	4	5
2-Pentene	16	17	29	35	39
Methylbutenes	82	81	68	60	56
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt.	1	1	0	0	0
90% OH, °F	372	395	415	430	437

TABLE D5

PROCESSING A H<sub>2</sub>/CO CHARGE OVER SG-B-3 AT  
400 PSIG FOLLOWING 600° AND 950°F HYDROGEN PRETREATMENTS

Run Number 159- Pretreated with H <sub>2</sub> at Days On Stream	142-1	142-2	142-3	144-1	144-2	144-3	144-4
	← 600°F →			← 950°F →			
	0.9	1.8	2.8	0.9	1.8	2.8	4.8
Temperature, Inlet, °F	483	491	473	492	498	498	498
Average, °F	484	492	474	493	500	502	502
Maximum, °F	508	515	486	513	515	516	515
Outlet, °F	469	479	465	478	486	490	490
GHSV	517	531	523	465	506	1029	1003
WHSV	0.8	0.8	0.8	0.7	0.7	1.5	1.5
Contact Time, sec	106.3	101.9	106.8	115.1	107.1	52.6	54.3
Material Balance, % wt	100	99	100	98	100	101	99
CO Conversion, % wt	41	43	27	39	37	25	23
To HC, % wt	99	98	99	98	98	99	98
H <sub>2</sub> Conversion, % wt	87	87	65	80	79	51	47
To HC, % wt	47	53	56	47	49	50	53
Total Conversion, % wt	44	46	29	42	40	27	25
gm HC/m <sup>3</sup> CO	192	235	135	195	187	135	137
gm C <sub>3</sub> <sup>+</sup> HC/gm Catalyst/hr	0.094	0.118	0.062	0.082	0.082	0.117	0.117
HC Selectivity, % wt							
C <sub>1</sub>	16	15	20	18	21	23	24
C <sub>2</sub>	2	2	3	3	3	4	3
C <sub>3</sub>	5	3	8	3	4	5	5
C <sub>4</sub>	6	9	10	8	8	10	8
C <sub>5</sub>	8	12	8	10	9	11	11
C <sub>5</sub> <sup>+</sup>	63	59	52	59	54	47	49
C <sub>6</sub>							
Olefin Selectivity, % wt							
C <sub>2</sub>	20	14	25	29	29	40	50
C <sub>3</sub>	69	98	73	70	66	57	57
C <sub>4</sub>	78	57	74	60	69	72	71
C <sub>5</sub>	82	82	80	77	78	79	80
C <sub>5</sub> Olefin Selectivity, % wt							
1-Pentene	6	6	7	2	3	3	3
2-Pentene	48	51	58	23	28	29	31
Methylbutenes	46	42	36	75	69	68	66
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	0	0	0	0	0	0	0
90% OH, °F	535	554	565	453	465	437	432

TABLE D6

PROCESSING A H<sub>2</sub>/CO CHARGE OVER SG-B-3 AT 50 PSIG AND 515°F  
(Pretreatment: H<sub>2</sub>, 16 Hrs, 600°F, 200 psig)

Run Number 159-153-	2	3
Days On-Stream	1.8	3.8
Temperature, Inlet, °F	505	507
Average, °F	507	508
Maximum, °F	514	513
Outlet, °F	497	500
GHSV	506	287
WHSV	0.7	0.4
Contact Time, sec.	16.7	29.5
Material Balance, % wt	101	103
CO Conversion, % wt	33	38
To HC, % wt	96	92
H <sub>2</sub> Conversion, % wt	75	84
To HC, % wt	59	62
Total Conversion, % wt	36	41
gm HC/m <sup>3</sup> CO	181	208
gm C <sub>3</sub> <sup>+</sup> HC/gm Catalyst/Hr	0.061	0.038
HC Selectivity, % wt		
C <sub>1</sub>	37	40
C <sub>2</sub>	4	4
C <sub>3</sub>	5	4
C <sub>4</sub>	11	7
C <sub>5</sub> <sup>+</sup>	12	10
C <sub>6</sub>	32	36
Olefin Selectivity, % wt		
C <sub>2</sub>	25	22
C <sub>3</sub>	55	37
C <sub>4</sub>	59	52
C <sub>5</sub>	71	61
C <sub>5</sub> Olefin Selectivity		
1-Pentene	2	2
2-Pentene	16	16
Methylbutenes	83	82
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	3	9
90% OH, °F	328	360

TABLE D7

PROCESSING A H<sub>2</sub>/CO CHARGE OVER SG-B-3 AT  
100 PSIG, 515°F, AND VARIOUS CONTACT TIMES  
(Pretreatment: H<sub>2</sub>, 16 Hrs, 600°F, 200 psig)

Run Number 159-	152-1	152-2	152-3	155-1	155-2
Days On-Stream	0.8	1.8	2.8	1.8	2.8
Temperature, Inlet, °F	498	501	503	503	503
Average, °F	496	500	504	501	506
Maximum, °F	512	515	516	513	517
Outlet, °F	484	490	494	492	495
GHSV	507	519	1027	290	1031
WHSV	0.7	0.8	1.5	0.4	1.5
Contact Time, sec.	29.6	28.9	14.6	51.8	14.5
Material Balance, % wt	99	101	101	97	102
CO Conversion, % wt	42	40	28	46	24
To HC, % wt	96	96	98	93	98
H <sub>2</sub> Conversion, % wt	88	85	64	91	57
To HC, % wt	55	56	63	56	60
Total Conversion, % wt	45	43	30	49	26
gm HC/m <sup>3</sup> CO	224	220	187	229	138
gm C <sub>3</sub> <sup>+</sup> HC/gm Catalyst/Hr	0.097	0.092	0.154	0.052	0.103
HC Selectivity, % wt					
C <sub>1</sub>	21	26	26	28	32
C <sub>2</sub>	3	3	3	3	4
C <sub>3</sub>	3	3	4	3	5
C <sub>4</sub>	10	9	11	11	11
C <sub>5</sub> <sup>+</sup>	15	13	15	12	13
C <sub>6</sub>	49	46	42	42	36
Olefin Selectivity, % wt					
C <sub>2</sub>	25	25	40	23	40
C <sub>3</sub>	43	49	56	37	50
C <sub>4</sub>	65	66	76	53	74
C <sub>5</sub>	75	77	84	63	84
C <sub>5</sub> Olefin Selectivity					
1-Pentene	2	2	2	2	2
2-Pentene	16	16	17	16	16
Methylbutenes	82	82	81	82	82
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	1	1	1	1	3
90% OH, °F	378	377	348	393	343



TABLE D8

PROCESSING A H<sub>2</sub>/CO CHARGE OVER SG-B-3 AT  
200 PSIG, 515 F, AND VARIOUS CONTACT TIMES

(Pretreatment: H<sub>2</sub>, 16 Hrs, 600°F, 200 psig)

CT Unit	159	159	159	143	143
Run Number	156-1	156-2	156-3	65-2	64-3
Days On-Stream	1.8	2.8	3.8	1.9	2.9
Temperature, Inlet, °F	497	495	494	494	495
Average, °F	495	499	494	506	504
Maximum, °F	513	520	514	516	514
Outlet, °F	484	486	484	487	487
GHSV	299	2006	531	1001	1009
WHSV	0.4	2.9	0.8	1.4	1.4
Contact Time, sec.	94.1	13.9	52.8	26.7	26.5
Material Balance, % wt	95	99	98	106	102
CO Conversion, % wt	45	15	37	37	36
To HC, % wt	94	99	98	99	99
H <sub>2</sub> Conversion, % wt	93	33	80	79	76
To HC, % wt	55	52	53	60	59
Total Conversion, % wt	48	16	40	40	39
gm HC/m <sup>3</sup> CO	234	86	200	224	217
gm C <sub>3</sub> <sup>+</sup> HC/gm Catalyst/Hr	0.064	0.145	0.093	0.192	0.183
HC Selectivity, % wt					
C <sub>1</sub>	19	24	21	19	20
C <sub>2</sub>	2	3	3	2	2
C <sub>3</sub>	2	5	4	5	5
C <sub>4</sub>	7	8	7	9	8
C <sub>5</sub> <sup>+</sup>	11	13	11	12	11
C <sub>6</sub>	59	46	54	53	53
Olefin Selectivity, % wt					
C <sub>2</sub>	29	100	50	32	32
C <sub>3</sub>	43	50	55	66	68
C <sub>4</sub>	64	79	73	80	79
C <sub>5</sub>	79	88	84	85	85
C <sub>5</sub> Olefin Selectivity					
1-Pentene	2	2	2	4	4
2-Pentene	16	21	23	31	35
Methylbutenes	82	76	75	65	61
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	1	1	0	1	1
90% OH, °F	411	367	400	366	396

TABLE D9

PROCESSING A H<sub>2</sub>/CO CHARGE OVER SG-B-3 AT  
400 PSIG, 515°F, AND VARIOUS CONTACT TIMES

(Pretreatment: H<sub>2</sub>, 16 Hrs, 600°F, 200 psig)

Run Number 159-	142-1	142-2	154-1	154-2	154-3	154-4
Days On-Stream	0.9	1.8	0.8	1.6	2.8	3.8
Temperature, Inlet, °F	483	491	480	491	498	495
Average, °F	484	492	483	492	497	497
Maximum, °F	508	515	506	511	516	515
Outlet, °F	469	479	468	477	486	484
GHSV	517	531	900	911	1987	516
WHSV	0.8	0.8	1.3	1.3	2.8	0.7
Contact Time, sec.	106.3	101.9	60.7	59.7	27.3	105.0
Material Balance, % wt	100	99	98	102	101	105
CO Conversion, % wt	41	43	34	36	21	41
To HC, % wt	99	98	99	99	99	98
H <sub>2</sub> Conversion, % wt	87	87	71	77	47	88
To HC, % wt	47	53	51	55	59	54
Total Conversion, % wt	44	46	37	39	23	44
gm HC/m <sup>3</sup> CO	192	235	176	204	126	214
gm C <sub>3</sub> <sup>+</sup> HC/gm Catalyst/Hr	0.094	0.118	0.150	0.172	0.225	0.098
HC Selectivity, % wt						
C <sub>1</sub>	16	15	14	16	18	18
C <sub>2</sub>	2	2	2	2	2	3
C <sub>3</sub>	5	3	5	5	7	5
C <sub>4</sub>	6	9	8	7	10	6
C <sub>5</sub> <sup>+</sup>	8	12	9	10	9	8
C <sub>6</sub>	63	59	62	60	53	60
Olefin Selectivity, % wt						
C <sub>2</sub>	20	14	25	40	33	29
C <sub>3</sub>	69	98	72	66	75	69
C <sub>4</sub>	78	57	74	75	71	75
C <sub>5</sub>	82	82	81	82	83	82
C <sub>5</sub> Olefin Selectivity						
1-Pentene	6	6	6	6	5	6
2-Pentene	48	51	56	59	51	58
Methylbutenes	46	42	38	35	43	36
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	0	0	0	0	0	0
90% OH, °F	535	554	514	505	456	525

TABLE D10

PROCESS VARIABLE STUDY WITH 2H<sub>2</sub>/CO OVER CATALYST SG-B-3 AT 50 AND 100 PSIG(Pretreatment: H<sub>2</sub>, 16 Hr, 200 psig, 600°F)

Run CT-159-	50 psig			100 psig				
	193-1	193-2	193-3	198-2	198-3	199-1	199-2	199-3
Days On Stream	1.0	2.0	3.0	1.8	2.8	1.1	2.0	3.0
Temperature, Inlet, °F	470	483	496	496	515	486	486	487
Average, °F	479	492	506	493	510	485	489	492
Maximum, °F	484	499	514	501	520	498	500	502
Outlet, °F	476	488	501	484	498	473	478	481
GHSV	599	560	560	501	507	291	711	1063
WHSV	0.6	0.6	0.6	0.5	0.5	0.3	0.7	1.1
Contact Time, sec.	16.1	16.1	15.8	32.4	31.4	52.3	21.4	14.3
Material Balance, % wt	98	97	96	97	96	93	96	97
CO Conversion, % wt	71	68	66	71	74	89	60	46
To HC, % wt	99	98	97	98	96	95	99	99
H <sub>2</sub> Conversion, % wt	74	74	76	82	86	92	64	50
To HC, % wt	55	57	61	56	59	55	54	54
Total Conversion, % wt	71	69	67	73	75	89	61	46
gm HC/m <sup>3</sup> CO	382	368	366	401	417	472	340	262
HC Selectivity, % wt								
C <sub>1</sub>	32	43	53	32	43	31	31	34
C <sub>2</sub>	4	5	5	4	5	4	4	4
C <sub>3</sub>	6	6	6	4	5	5	5	5
C <sub>4</sub>	10	9	7	8	7	6	9	7
C <sub>5</sub>	13	10	8	12	10	8	12	11
C <sub>6</sub> <sup>+</sup>	35	27	21	40	31	46	39	39
Olefin Selectivity, % wt								
C <sub>2</sub>	13	8	4	11	6	4	16	18
C <sub>3</sub>	15	13	21	10	10	5	19	28
C <sub>4</sub>	47	48	48	42	38	30	53	57
C <sub>5</sub>	62	61	57	57	52	44	68	76
C <sub>5</sub> Olefin Selectivity, % wt								
1-Pentene	2	2	2	2	2	2	2	3
2-Pentene	16	15	16	16	16	14	17	19
Methylbutenes	83	83	82	82	82	84	81	79
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	0	0	1	0	1	1	0	1
90% OH, °F	366	342	328	389	370	392	364	357

TABLE D11

PROCESS VARIABLE STUDY WITH 2H<sub>2</sub>/CO OVER CATALYST SG-B-3 AT 200 AND 300 PSIG  
(Pretreatment: H<sub>2</sub>, 16 Hr, 200 psig, 600°F)

	200 psig					300 psig				
	190-2	190-3	190-4	194-1	194-2	194-3	195-1	195-2	195-3	197-1
Run CT-159-	2.0	2.9	5.0	1.0	2.0	3.0	1.0	2.1	3.0	1.1
Days On Stream	489	526	476	462	473	486	463	481	498	471
Temperature, Inlet, °F	491	521	482	475	496	501	471	490	507	476
Average, °F	512	547	486	485	497	513	481	501	523	492
Maximum, °F	482	511	480	470	482	493	464	482	498	462
Outlet, °F	501	500	500	1004	990	991	493	514	520	1006
GHSV	0.5	0.5	0.5	1.1	1.0	1.0	0.5	0.5	0.5	1.1
WHSV	56.1	54.3	57.8	28.8	28.9	28.3	86.4	81.1	78.4	41.9
Contact Time, sec.	98	100	100	97	96	97	97	99	98	95
Material Balance, % wt										
CO Conversion, % wt	85	83	54	68	72	76	79	81	83	61
To HC, % wt	97	94	99	100	99	98	99	99	97	100
H <sub>2</sub> Conversion, % wt	91	91	61	76	77	85	85	88	91	63
To HC, % wt	58	62	59	53	54	58	51	53	57	51
Total Conversion, % wt	86	84	55	69	72	77	79	82	84	61
gm HC/m <sup>3</sup> CO	470	466	319	375	418	463	419	446	471	344
HC Selectivity, % wt										
C <sub>1</sub>	24	40	27	17	18	26	18	22	30	18
C <sub>2</sub>	4	6	4	2	2	3	2	3	4	2
C <sub>3</sub>	5	5	6	5	5	5	5	6	5	5
C <sub>4</sub>	6	5	9	8	10	10	6	5	6	6
C <sub>5</sub>	10	8	11	11	12	11	8	8	9	10
C <sub>6</sub> <sup>+</sup>	51	36	44	58	53	44	60	57	46	59
Olefin Selectivity, % wt										
C <sub>2</sub>	5	2	12	15	13	8	12	3	5	27
C <sub>3</sub>	18	8	30	36	30	24	24	19	14	33
C <sub>4</sub>	55	40	58	65	65	60	58	53	48	63
C <sub>5</sub>	66	57	71	75	74	71	66	64	63	70
C <sub>5</sub> Olefin Selectivity, % wt										
1-Pentene	4	2	3	5	5	4	6	5	4	6
2-Pentene	34	18	27	46	45	34	57	47	31	56
Methylbutenes	62	80	71	49	50	63	38	48	65	38
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	0	1	0	0	0	0	0	0	0	0
90% OH, °F	430	383	395	462	430	390	512	498	425	511

TABLE D12

PROCESS VARIABLE STUDY WITH 2H<sub>2</sub>/CO OVER CATALYST SG-B-3 AT 400 PSIG(Pretreatment: H<sub>2</sub>, 16 Hr, 200 psig, 600°F)

Run CT-159- Days On Stream	191-1	191-2	191-3	192-1	192-2	192-3	192-4	196-1	196-2
Temperature, Inlet, °F	468	493	522	463	475	492	475	478	486
Average, °F	471	493	521	475	486	505	482	483	492
Maximum, °F	483	510	545	482	494	512	484	494	499
Outlet, °F	463	483	509	464	478	498	480	473	486
GHSV	494	520	521	1043	1010	987	967	490	976
WHSV	0.5	0.5	0.5	1.0	1.0	1.0	0.9	0.5	1.0
Contact Time, sec.	113.3	104.6	100.8	53.8	54.8	55.0	57.8	112.9	56.4
Material Balance, % wt	95	99	100	97	100	100	99	97	102
CO Conversion, % wt	87	90	91	71	64	65	19	82	48
To HC, % wt	99	98	96	100	100	99	100	99	99
H <sub>2</sub> Conversion, % wt	89	92	93	72	67	70	22	89	58
To HC, % wt	53	55	59	53	54	56	59	52	58
Total Conversion, % wt	88	90	91	71	64	66	19	83	49
gm HC/m <sup>3</sup> CO	459	497	519	397	354	363	104	437	288
HC Selectivity, % wt									
C <sub>1</sub>	21	21	32	18	18	25	37	21	29
C <sub>2</sub>	3	3	5	2	3	3	5	3	4
C <sub>3</sub>	5	5	5	6	6	6	7	5	7
C <sub>4</sub>	5	5	5	8	9	7	8	5	7
C <sub>5</sub>	7	9	9	9	10	10	9	8	9
C <sub>6</sub> <sup>+</sup>	58	57	44	58	55	49	35	58	45
Olefin Selectivity, % wt									
C <sub>2</sub>	5	6	2	11	13	11	25	6	23
C <sub>3</sub>	22	11	12	16	21	14	17	24	26
C <sub>4</sub>	48	44	41	49	47	43	10	56	49
C <sub>5</sub>	53	51	54	57	54	59	62	62	65
C <sub>5</sub> Olefin Selectivity, % wt									
1-Pentene	7	7	3	7	7	5	3	6	4
2-Pentene	68	58	28	70	60	42	27	58	43
Methylbutenes	25	34	70	23	32	53	70	36	53
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	0	0	0	0	0	0	0	0	0
90% OH, °F	525	487	450	552	526	441	388	517	465

TABLE D13

PROCESSING H<sub>2</sub>/CO CHARGE OVER SG-B-3 AT 200 PSIG  
FOLLOWING OXIDATIVE REGENERATION

(Regeneration: Air, 1 Hr. @ 950°F and 100 psig)  
(Pretreatment: H<sub>2</sub>, 16 Hr. @ 600°F and 200 psig)

	1	2	3	4	5	6	7
Run CT 159-140-							
Days On-Stream	0.9	1.8	2.8	3.8	5.8	6.8	7.8
Temperature, Inlet, °F	468	471	495	495	505	505	506
Average, °F	473	476	501	500	510	510	510
Maximum, °F	486	487	517	515	528	524	525
Outlet, °F	460	464	486	488	496	496	497
GHSV	509	563	557	547	550	543	544
WHSV	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Contact Time, sec.	56.8	51.3	50.2	51.3	50.3	51.2	51.0
Material Balance, % wt.	99	98	97	97	99	97	104
CO Conversion, % wt.	34	37	40	39	41	38	41
To HC, % wt.	99	99	98	98	97	96	97
H <sub>2</sub> Conversion, % wt.	79	75	84	84	84	83	82
To HC, % wt.	55	48	51	53	52	56	49
Total Conversion, % wt.	37	39	43	42	44	42	44
gm HC/m <sup>3</sup> CO	198	197	220	217	230	217	209
gm C <sub>3</sub> <sup>+</sup> HC/gm Catalyst/Hr	0.097	0.108	0.113	0.105	0.107	0.090	0.090
HC Selectivity, % wt.							
C <sub>1</sub>	15	14	19	22	24	30	29
C <sub>2</sub>	2	2	2	2	3	4	3
C <sub>3</sub>	4	4	3	4	3	4	3
C <sub>4</sub>	8	7	8	8	8	8	7
C <sub>5</sub>	11	10	11	11	13	10	10
C <sub>5</sub> <sup>+</sup>	61	63	57	52	50	45	47
Olefin Selectivity, % wt.							
C <sub>2</sub>	20	25	16	16	25	22	25
C <sub>3</sub>	70	70	69	63	49	55	49
C <sub>4</sub>	75	76	75	72	71	70	69
C <sub>5</sub>	84	84	83	83	81	81	82
C <sub>5</sub> Olefin Selectivity							
1-Pentene	4	5	3	3	2	2	2
2-Pentene	31	40	27	25	20	19	18
Methylbutenes	65	55	70	72	78	78	80
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt.	1	0	0	1	6	1	1
90% OH, °F	456	495	418	387	368	368	369

TABLE D14

PROCESSING A 2H<sub>2</sub>/CO CHARGE OVER SG-B-3 AT 500°F AND 200 PSIG  
(Pretreat: H<sub>2</sub>, 16 Hr, 0 psig, 950°F)

	146-1	146-2	146-3	146-4	146-5	146-6	146-7	146-8
Run Number 159- Days On-Stream	0.8	2.8	3.8	4.9	5.8	6.8	7.8	9.9
Temperature, Inlet, °F	485	486	491	490	490	490	489	491
Average, °F	484	488	490	490	490	490	490	492
Maximum, °F	500	500	501	501	500	500	500	502
Outlet, °F	468	475	479	480	480	480	481	482
Pressure, psig	200	200	200	200	200	200	200	203
GHSV	503	520	523	524	523	527	519	527
WHSV	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Contact Time, sec.	56.7	54.8	54.4	54.3	54.5	54.0	54.9	53.9
Material Balance, % wt	96	97	101	100	101	99	102	100
CO Conversion, % wt TO HC, % wt	83 99	79 99	77 98	76 99	72 99	71 99	74 99	74 99
H <sub>2</sub> Conversion, % wt TO HC, % wt	89 52	85 57	85 56	83 56	81 58	77 57	79 58	80 61
Total Conversion, % wt	84	80	78	77	74	72	75	75
gm HC/m <sup>3</sup> CO gm C <sub>3</sub> <sup>+</sup> HC/gm Catalyst/Hr	408 0.111	475 0.141	437 0.118	428 0.118	421 0.111	409 0.111	428 0.106	461 0.116
HC Selectivity, % wt								
C <sub>1</sub>	24	19	26	25	28	26	29	28
C <sub>2</sub>	3	3	4	4	4	4	4	4
C <sub>3</sub>	5	5	6	6	5	6	6	6
C <sub>4</sub>	6	9	8	9	8	8	8	9
C <sub>5</sub> <sup>+</sup>	10	12	10	10	10	10	10	10
C <sub>6</sub>	52	52	47	47	45	47	44	43
Olefin Selectivity, % wt								
C <sub>2</sub>	3	7	6	6	7	11	7	9
C <sub>3</sub>	19	22	24	23	25	20	20	16
C <sub>4</sub>	42	49	51	52	53	52	51	51
C <sub>5</sub>	58	60	62	65	64	64	62	62
C <sub>5</sub> Olefin Selectivity								
1-Pentene	2	3	3	3	3	3	3	3
2-Pentene	22	27	31	31	32	32	32	31
Methylbutenes	76	70	66	66	65	64	65	66
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt 90% OH, °F	0 437	0 431	0 427	0 425	0 430	0 427	0 418	0 413

TABLE D15

PROCESSING A 2H<sub>2</sub>/CO CHARGE AT 500°F AND 200 PSIG  
 FOLLOWING OXIDATIVE REGENERATION OF SG-B-3

(159-147 1 Hr Air at 950°F, 100 psig)

(159-148 5 Hr Air at 950°F, 100 psig)

Run Number 159- Days On-Stream	147-1 0.8	147-2 1.8	148-1 0.8	148-2 1.8	148-3 3.8
Temperature, Inlet, °F	486	490	485	488	490
Average, °F	494	498	493	496	497
Maximum, °F	499	504	500	501	502
Outlet, °F	486	491	487	490	491
Pressure, psig	200	200	200	200	205
GHSV	516	517	500	501	497
WHSV	0.5	0.5	0.5	0.5	0.5
Contact Time, sec.	55.3	54.8	57.0	56.7	58.5
Material Balance, % wt	97	102	94	100	100
CO Conversion, % wt	76	72	74	70	67
To HC, % wt	99	99	99	99	99
H <sub>2</sub> Conversion,	80	78	78	75	72
To HC, % wt	53	58	54	60	60
Total Conversion, % wt	76	73	74	70	67
gm HC/m <sup>3</sup> CO	375	422	370	429	412
gm C <sub>3</sub> <sup>+</sup> HC/gm Catalyst/Hr	0.093	0.105	0.087	0.104	0.100
HC Selectivity, % wt					
C <sub>1</sub>	28	27	30	28	28
C <sub>2</sub>	4	4	4	4	4
C <sub>3</sub>	5	5	5	5	6
C <sub>4</sub>	9	6	8	8	9
C <sub>4</sub>	10	10	10	8	10
C <sub>5</sub> <sup>+</sup>	44	48	43	46	43
C <sub>6</sub>					
Olefin Selectivity, % wt					
C <sub>2</sub>	3	6	7	10	8
C <sub>3</sub>	19	17	6	6	18
C <sub>3</sub>	38	41	40	43	45
C <sub>4</sub>	53	56	56	59	61
C <sub>5</sub>					
C <sub>5</sub> Olefin Selectivity					
1-Pentene	2	2	2	2	2
2-Pentene	17	18	16	18	19
Methylbutenes	81	80	82	80	79
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	1	1	1	1	1
90% OH, °F	418	400	425	415	398



TABLE D16  
AGING AND REGENERATION OF CATALYST SG-B-3  
(H<sub>2</sub>/CO at 200 psig)

Run CT-143-67- Days On-Stream	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Temperature, Inlet, °F	475	477	476	472	475	478	471	471	478	499	505	504	503	504	506	506	506	506	507	510
Average, °F	478	479	479	476	478	480	476	476	481	503	509	508	507	508	510	510	510	510	511	511
Maximum, °F	485	484	483	481	484	486	483	483	485	516	517	516	514	515	516	516	517	516	517	517
Outlet, °F	465	468	469	463	465	469	464	464	470	490	497	497	496	497	498	498	497	497	497	507
GHSV	530	550	539	591	541	527	499	499	523	536	524	529	523	530	540	530	531	550	507	507
WHSV	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Contact Time, sec.	55.1	53.1	54.2	49.4	54.0	55.4	58.5	55.5	55.8	56.6	55.7	55.2	55.8	55.1	54.0	55.1	55.0	53.1	57.6	57.6
Material Balance, %	98	102	103	102	96	100	102	98	100	104	98	101	101	97	101	100	101	100	104	104
CO Conversion, %	42	35	34	36	37	31	36	33	32	39	37	35	33	33	31	30	29	29	30	30
To HC, %	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
H <sub>2</sub> Conversion, %	62	75	79	77	78	74	76	69	69	79	79	75	72	72	68	68	66	65	65	65
To HC, %	51	56	59	53	54	59	53	54	54	53	54	53	56	57	54	59	57	55	54	54
Total Conversion, %	45	38	37	39	40	34	39	36	35	42	40	38	36	35	34	33	31	32	32	32
G HC/m <sup>3</sup> CO	231	207	196	204	210	182	203	193	180	226	210	195	191	194	172	181	163	163	162	162
HC Selectivity, %	13	15	18	13	14	18	13	14	16	17	22	23	24	26	28	28	29	29	30	30
C <sub>1</sub>	2	2	2	2	2	3	2	2	1	2	2	2	3	3	3	3	3	3	3	3
C <sub>2</sub>	5	5	5	5	4	5	4	5	5	3	3	4	3	4	4	4	4	4	4	4
C <sub>3</sub>	5	5	5	5	5	5	6	5	5	3	3	4	3	4	4	4	4	4	4	4
C <sub>4</sub>	8	9	6	8	6	6	6	6	5	7	7	7	6	7	7	7	8	8	8	7
C <sub>5</sub> <sup>+</sup>	67	63	64	66	65	61	67	64	66	12	11	10	10	7	8	9	9	9	9	9
Olefin Selectivity, %	20	26	40	26	26	40	26	25	33	19	17	21	17	16	16	19	19	19	19	19
C <sub>2</sub>	75	70	72	72	72	70	67	69	70	48	43	49	57	49	57	57	57	58	58	58
C <sub>3</sub>	81	81	80	73	77	72	75	80	78	70	67	69	72	69	78	72	72	72	70	70
C <sub>4</sub>	85	84	84	83	83	83	83	83	83	79	80	81	82	82	83	82	83	83	83	83
C <sub>5</sub>	8	8	7	4	6	6	3	5	5	2	2	2	2	2	2	2	2	2	2	2
1-Pentene	68	70	69	42	57	59	33	45	42	18	18	19	20	21	21	21	21	21	21	21
2-Pentene	24	22	24	37	35	35	64	53	53	80	80	78	78	77	77	77	77	77	77	77
Methylbutenes	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
C <sub>5</sub> <sup>+</sup> Aromatic, %	530	522	492	522	528	545	509	517	523	389	376	372	378	361	384	380	380	380	380	380
96% OH, %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE D17

COMPARISON OF FRESH AND REGENERATED SG-B-3 FOR  
PROCESSING H<sub>2</sub>/CO CHARGE AT 515°F AND 200 PSIG

CT Unit	143						158		
	Fresh (1)			After 3rd Reg (2)			After 3rd Reg (3)		
Days On-Stream	0.9	1.9	2.9	0.9	1.9	2.9	0.9	1.9	2.9
Run	64-1	64-2	64-3	68-19	68-20	68-21	106-19	106-20	106-21
Temperature, Inlet, °F	490	494	495	490	495	498	491	496	498
Average, °F	500	506	504	502	506	512	498	501	502
Maximum, °F	513	516	514	514	513	515	516	515	515
Outlet, °F	480	487	487	486	490	492	488	493	494
GHSV	890	1001	1009	1027	1034	1034	1030	1033	1033
WHSV	1.2	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5
Contact Time, sec.	30.0	26.7	26.5	26.0	25.8	25.8	25.9	25.8	25.8
Material Balance, % wt	101	106	102	103	100	104	101	98	100
CO Conversion, % wt	43	37	36	29	27	25	31	30	29
To HC, % wt	98	99	99	99	99	99	99	99	99
H <sub>2</sub> Conversion, % wt	87	79	76	62	55	56	70	63	62
To HC, % wt	58	60	59	54	53	53	58	54	55
Total Conversion, % wt	47	40	39	31	29	27	34	32	31
g HC/m <sup>3</sup> CO	246	224	217	170	159	146	183	169	163
HC Selectivity, % wt									
C <sub>1</sub>	16	19	20	18	18	21	20	21	22
C <sub>2</sub>	2	2	2	2	2	2	2	2	3
C <sub>3</sub>	4	5	5	3	4	4	4	3	4
C <sub>4</sub>	7	9	8	8	9	9	10	11	10
C <sub>5</sub>	11	12	11	12	12	10	12	13	13
C <sub>5+</sub>	60	53	53	57	55	54	52	50	48
Olefin Selectivity, % wt									
C <sub>2</sub>	28	32	32	32	26	35	24	24	40
C <sub>3</sub>	62	66	68	50	65	66	49	49	49
C <sub>4</sub>	77	80	79	67	73	72	69	67	70
C <sub>5</sub>	83	85	85	81	82	83	80	80	81
C <sub>5</sub> Olefin Selectivity, % wt									
1-Pentene	3	4	4	2	2	2	2	2	2
2-Pentene	24	31	35	19	20	21	18	18	19
Methylbutenes	73	65	61	79	78	77	80	80	79
C <sub>6</sub> <sup>+</sup> Aromatics, % wt	1	1	1	6	7	6	<1	7	<1
90% OH, °F	387	366	396	378	-	-	378	367	359

(1) H<sub>2</sub> activation for 16 hrs, 600°F, 200 psig

(2) Catalyst regeneration for 16 hrs, air, 950°F, one atmosphere + H<sub>2</sub> activation 16 hrs, 600°F, 0 psig

(3) Catalyst regeneration for 16 hrs, air, 950°F, 100 psig + H<sub>2</sub> activation 16 hrs, 600°F, 0 psig

TABLE D18

PROCESSING A 2 H<sub>2</sub>/CO CHARGE OVER REGENERATED SG-B-3  
 AT 500°F AND 200 PSIG  
 (4th Regeneration: 16 Hrs, Air, 950°F, 100 psig)  
 (Pretreat: H<sub>2</sub>, 16 Hrs, 600°F, 0 psig)

Run CT-158-106- Days On-Stream	22 0.9	23 1.8	24 2.8	25 4.9	26 5.9	27 6.9
Temperature, Inlet, °F	481	486	488	487	489	490
Average, °F	484	489	492	489	492	493
Maximum, °F	497	500	502	497	500	500
Outlet, °F	473	479	483	481	482	481
Pressure, psig	200	200	200	200	200	200
GHSV	501	514	516	514	514	514
WHSV	0.5	0.5	0.5	0.5	0.5	0.5
Material Balance, % wt	93	97	97	98	101	97
CO Conversion, % wt	77	74	71	63	59	57
To HC, % wt	99	99	99	99	99	99
H <sub>2</sub> Conversion, % wt	80	78	75	68	65	63
To HC, % wt	52	54	54	57	58	58
Total Conversion, % wt	77	75	71	64	60	58
gm HC/m <sup>3</sup> CO	412	413	398	378	348	344
HC Selectivity, % wt						
C <sub>1</sub>	24	26	28	28	33	32
C <sub>2</sub>	3	4	4	4	5	5
C <sub>3</sub>	5	5	6	5	5	5
C <sub>4</sub>	7	7	8	9	6	6
C <sub>5</sub>	11	10	11	11	8	7
C <sub>6</sub> <sup>+</sup>	50	48	43	43	43	45
Olefin Selectivity, % wt						
C <sub>2</sub>	8	8	8	10	10	10
C <sub>3</sub>	3	10	10	10	12	14
C <sub>4</sub>	30	30	28	31	28	32
C <sub>5</sub>	46	43	26	42	43	46
C <sub>5</sub> Olefin Selectivity, % wt						
1-Pentene	2	2	2	2	2	2
2-Pentene	16	15	19	14	14	14
Methylbutenes	82	83	79	84	84	84
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	< 1	< 1	< 1	< 1	< 1	8
90% OH, °F	403	372	364	375	362	369

TABLE D19

PROCESSING A 2 H<sub>2</sub>/CO CHARGE OVER REGENERATED SG-B-3  
 AT 500°F AND 200 PSIG  
 (5th Regeneration: 16 Hrs, Air, 950°F, 100 psig)  
 (Pretreat: H<sub>2</sub>, 16 Hrs, 600°F, 0 psig)

Run CT-158-106- Days On-Stream	28	29	30	31	32
	1.9	2.9	4.0	5.0	6.0
Temperature, Inlet, °F	477	488	491	491	492
Average, °F	480	491	493	493	493
Maximum, °F	492	499	502	501	501
Outlet, °F	469	483	485	485	485
Pressure, psig	200	200	200	200	200
GHSV	536	530	527	527	521
WHSV	0.5	0.5	0.5	0.5	0.5
Material Balance, % wt	92	96	98	98	97
CO Conversion, % wt	61	68	65	61	58
To HC, % wt	99	99	99	99	99
H <sub>2</sub> Conversion, % wt	63	73	70	65	62
To HC, % wt	52	55	54	54	54
Total Conversion, % wt	61	69	66	61	59
gm HC/m <sup>3</sup> CO	340	388	364	334	327
HC Selectivity, % wt					
C <sub>1</sub>	18	26	29	31	33
C <sub>2</sub>	2	4	4	4	4
C <sub>3</sub>	5	6	6	6	7
C <sub>4</sub>	10	10	9	9	7
C <sub>5</sub>	12	11	10	9	9
C <sub>6</sub> <sup>+</sup>	53	43	42	41	40
Olefin Selectivity, % wt					
C <sub>2</sub>	25	9	9	10	16
C <sub>3</sub>	1	8	9	3	1
C <sub>4</sub>	21	20	18	19	9
C <sub>5</sub>	31	29	27	28	28
C <sub>5</sub> Olefin Selectivity, % wt					
1-Pentene	2	2	2	2	2
2-Pentene	14	13	13	13	13
Methylbutenes	84	85	85	85	85
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	8	6	1	1	1
90% OH, °F	-	-	-	-	-

TABLE D20

PROCESSING A H<sub>2</sub>/CO CHARGE OVER REGENERATED SG-B-3  
AT 500°F AND 200 PSIG

(4th Regeneration: 16 Hrs, Air, 950°F, 0 psig)

(Pretreat: H<sub>2</sub>, 16 Hrs, 600°F, 0 psig)

Run CT-143-68- Days On-Stream	22 0.9	23 1.9	24 3.9	25 4.9	26 5.9	27 6.9	28 7.9
Temperature, Inlet, °F	483	487	487	491	490	491	491
Average, °F	489	493	494	496	494	495	494
Maximum, °F	498	501	499	501	500	500	500
Outlet, °F	477	482	482	485	484	485	486
Pressure, psig	200	200	200	200	200	200	200
GHSV	525	530	496	519	517	514	504
WHSV	0.7	0.8	0.7	0.7	0.7	0.7	0.7
Material Balance, % wt	98	102	90	102	105	102	104
CO Conversion, % wt	34	31	29	29	27	26	25
To HC, % wt	99	99	99	99	99	99	99
H <sub>2</sub> Conversion, % wt	68	68	62	61	63	59	57
To HC, % wt	53	55	56	55	61	58	59
Total Conversion, % wt	36	34	31	31	30	28	27
gm HC/m <sup>3</sup> CO	190	175	169	162	139	151	141
HC Selectivity, % wt							
C <sub>1</sub>	14	18	18	21	20	22	23
C <sub>2</sub>	1	3	2	2	2	3	3
C <sub>3</sub>	3	3	3	4	4	5	5
C <sub>4</sub>	7	7	8	8	8	8	8
C <sub>5</sub>	10	9	11	10	10	9	9
C <sub>5+</sub>	65	60	58	55	56	53	52
Olefin Selectivity, % wt							
C <sub>2</sub>	33	40	33	32	35	39	26
C <sub>3</sub>	49	50	50	57	50	57	56
C <sub>4</sub>	65	67	74	66	69	71	71
C <sub>5</sub>	77	79	79	79	81	81	81
C <sub>5</sub> Olefin Selectivity, % wt							
1-Pentene	2	2	2	2	2	2	2
2-Pentene	18	19	20	21	22	22	23
Methylbutenes	80	79	78	77	76	76	75
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	9	7	7	7	7	8	8
90% OH, °F	449	398	399	364	348	363	331

TABLE D21

PROCESSING A H<sub>2</sub>/CO CHARGE OVER REGENERATED SG-B-3  
AT 500°F AND 200 PSIG

(5th Regeneration: 16 Hrs, Air, 950°F, 0 psig)  
(Pretreat: H<sub>2</sub>, 16 Hrs, 600°F, 0 psig)

Run CT-143-68-	29	30	32	33	34
Days On-Stream	0.8	2.8	4.8	5.8	6.8
Temperature, Inlet, °F	483	493	493	494	494
Average, °F	490	498	498	497	498
Maximum, °F	492	505	502	503	503
Outlet, °F	488	488	487	488	489
Pressure, psig	200	200	200	200	200
GHSV	520	524	521	521	521
WHSV	0.7	0.7	0.7	0.7	0.7
Material Balance, % wt	103	95	103	101	101
CO Conversion, % wt	35	31	25	24	24
To HC, % wt	99	99	99	99	99
H <sub>2</sub> Conversion, % wt	71	67	59	58	56
To HC, % wt	49	58	59	58	57
Total Conversion, % wt	38	34	28	26	26
gm HC/m <sup>3</sup> CO	175	179	143	127	132
HC Selectivity, % wt					
C <sub>1</sub>	15	18	24	26	26
C <sub>2</sub>	2	3	2	2	2
C <sub>3</sub>	4	2	4	5	5
C <sub>4</sub>	9	12	9	7	8
C <sub>5</sub>	12	15	9	11	10
C <sub>5+</sub>	58	50	52	49	49
C <sub>6</sub>					
Olefin Selectivity, % wt					
C <sub>2</sub>	35	41	35	67	50
C <sub>3</sub>	42	3	50	50	50
C <sub>4</sub>	61	59	64	60	68
C <sub>5</sub>	75	77	79	79	80
C <sub>5</sub> Olefin Selectivity, % wt					
1-Pentene	2	2	2	2	2
2-Pentene	17	18	19	19	20
Methylbutenes	81	80	79	79	78
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	7	7	6	7	1
90% OH, °F	-	367	-	-	-

TABLE D22

PROCESSING H<sub>2</sub>/CO OVER REGENERATED SG-B-3 AT 500°F AND 200 PSIG

(6th Regeneration: 16 Hrs, Air, 950°F, 0 psig)

(Pretreat: 16 Hrs, H<sub>2</sub>, 950°F, 0 psig)

Run Number CT-143-68-	35	36	37	38	39	40
Days On-Stream	1.9	2.9	3.9	4.9	5.9	6.9
Temperature, Inlet, °F	490	494	494	496	493	493
Average, °F	496	499	498	500	497	496
Maximum, °F	501	503	502	504	501	500
Outlet, °F	487	490	489	491	489	488
GHSV	523	536	576	533	533	533
WHSV	0.7	0.8	0.8	0.7	0.7	0.8
Material Balance, % wt	102	102	106	103	102	101
CO Conversion, % wt	27	25	22	22	20	19
To HC, % wt	99	99	99	99	99	99
H <sub>2</sub> Conversion, % wt	57	53	54	50	47	44
To HC, % wt	56	55	61	57	57	57
Total Conversion, % wt	29	27	25	24	22	21
g HC/m <sup>3</sup> CO	153	136	111	121	111	106
HC Selectivity, % wt						
C <sub>1</sub>	18	20	23	23	24	24
C <sub>2</sub>	1	2	2	2	2	3
C <sub>3</sub>	3	4	5	4	6	4
C <sub>4</sub>	10	8	10	10	10	9
C <sub>5</sub>	12	10	9	9	8	9
C <sub>5+</sub>	56	56	51	52	50	51
Olefin Selectivity, % wt						
C <sub>2</sub>	47	50	50	50	50	32
C <sub>3</sub>	39	31	40	40	49	50
C <sub>4</sub>	57	54	57	62	62	65
C <sub>5</sub>	69	73	76	76	78	79
C <sub>5</sub> Olefin Selectivity, % wt						
1-Pentene	2	2	1	2	2	2
2-Pentene	17	17	17	17	17	18
Methylbutenes	81	81	82	81	81	80
C <sub>6</sub> <sup>+</sup> Aromatics, % wt	9	9	9	10	9	10
90% OH, °F	385	383	383	390	378	374

PROCESSING H<sub>2</sub>/CO OVER SC-B-3 AT 515°F AND 200 PSIG (a)  
(PRETREAT: H<sub>2</sub>, 16 Hr, 600°F, 200 psig)

	Cycle 1			Cycle 2			Cycle 3			Cycle 4					
	158-1	158-2	158-3	159-1	159-2	159-3	160-1	160-2	160-3	160-4	161-1	161-2	161-3	161-4	161-5
Run CT-159-Days On-Stream	1.0	1.9	2.9	2.0	3.0	4.0	1.0	3.1	5.2	6.2	1.0	3.0	4.1	5.0	6.0
Temperature, Inlet, °F	473	493	497	488	497	490	496	499	499	503	502	501	500	502	505
Average, °F	494	496	500	491	501	502	500	503	503	505	502	502	503	506	507
Maximum, °F	513	516	516	507	514	514	514	515	513	516	515	513	512	515	516
Outlet, °F	481	485	480	481	480	493	489	494	495	496	493	495	496	497	502
GHSV	510	506	503	493	493	490	534	524	524	523	521	509	513	519	521
WHSV	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8
Contact Time, sec.	55.1	55.6	55.7	57.4	57.0	57.3	52.5	53.5	53.6	53.6	53.8	55.3	56.1	54.1	53.7
Material Balance, % wt	98	97	98	98	100	101	99	94	101	104	95	98	97	96	96
CO Conversion, % wt	44	42	42	39	41	39	39	38	35	36	39	37	33	34	33
To HC, % wt	97	97	96	97	97	97	98	98	98	97	98	98	97	97	97
H <sub>2</sub> Conversion, % wt	91	87	88	79	86	85	84	82	75	80	82	76	72	74	74
To HC, % wt	53	54	51	56	54	57	55	59	57	58	52	51	55	54	55
Total Conversion, % wt	48	45	45	42	45	42	43	41	38	39	42	39	36	37	36
gm HC/m <sup>3</sup> CO	239	240	211	230	209	214	211	224	203	192	214	197	186	189	177
gm C <sub>3</sub> <sup>+</sup> HC/gm Catalyst/hr	0.114	0.113	0.091	0.106	0.086	0.088	0.098	0.098	0.089	0.076	0.101	0.084	0.078	0.077	0.070
HC Selectivity, % wt	17	17	24	15	22	23	20	23	23	29	21	25	28	30	32
C <sub>1</sub>	2	2	3	1	3	2	2	2	3	3	2	3	3	3	3
C <sub>2</sub>	2	2	3	3	4	3	3	4	4	4	3	3	4	3	4
C <sub>3</sub>	7	8	6	6	8	8	8	10	9	8	7	8	8	6	7
C <sub>4</sub>	12	12	12	13	12	12	13	13	11	11	11	11	11	11	11
C <sub>5</sub>	59	58	54	61	51	52	55	49	50	46	56	50	46	46	44
C <sub>6</sub>															
Olefin Selectivity, % wt	29	29	29	51	29	33	33	34	33	33	33	33	33	33	33
C <sub>2</sub>	43	84	57	61	55	49	42	49	59	49	42	43	50	43	43
C <sub>3</sub>	69	70	74	76	73	73	68	70	76	72	65	68	73	68	68
C <sub>4</sub>	81	83	83	82	83	83	80	81	83	83	78	80	82	82	82
C <sub>5</sub>															
C <sub>5</sub> Olefin Selectivity															
1-Pentene	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2
2-Pentene	19	20	21	25	24	23	18	20	22	22	17	18	20	19	19
Methylbutene	79	78	76	72	73	74	80	78	75	76	81	80	78	79	79
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	0	0	0	0	0	0	0	1	1	0	0	0	1	1	1
90% OH, %F	420	407	397	428	409	397	396	393	390	390	400	390	390	384	383

(a) Regenerations in hydrogen at 200 psig and 600°F.



TABLE D23 (Continued)

PROCESSING H<sub>2</sub>/CO OVER REGENERATED SG-B-3 AT 515°F AND 200 PSIG

Run No-159- Days On Stream	Cycle 6			Cycle 7			Cycle 8							
	163-1 1.3	163-2 3.0	163-3 4.0	164-1 1.0	164-2 2.3	164-3 4.0	164-4 5.0	164-5 6.0	164-6 7.0	164-7 8.0	165-1 2.0	165-2 3.0	165-3 4.0	165-4 5.0
Temperature, Inlet, °F	500	500	503	502	504	504	505	504	505	504	501	503	503	503
Average, °F	504	504	507	507	509	510	510	509	509	509	508	510	509	509
Maximum, °F	514	513	515	515	515	516	515	515	515	515	515	515	515	514
Outlet, °F	495	497	501	503	502	503	504	504	504	504	501	505	503	503
CHSV	526	516	516	513	504	506	504	507	506	507	501	501	506	501
WHSV	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Contact Time, sec.	53.4	54.5	54.4	55.6	55.3	55.4	55.6	55.3	55.5	55.3	55.8	55.9	55.5	56.0
Material Balance, % wt	96	97	99	96	98	98	100	100	99	99	98	101	99	100
CO Conversion, % wt	38	35	34	37	36	34	33	33	32	31	37	35	32	31
To HC, % wt	98	98	98	98	98	98	98	98	98	98	99	98	98	98
H <sub>2</sub> Conversion, % wt	81	75	76	75	78	74	72	70	69	68	73	71	69	67
To HC, % wt	54	56	56	56	55	57	55	57	56	56	55	55	56	56
Total Conversion, % wt	41	38	37	40	39	36	36	36	35	34	39	37	35	34
gm C <sub>1</sub> +HC/gm Catalyst/hr	200	0.097	0.086	200	0.091	0.086	0.088	0.079	0.071	0.068	216	0.095	0.078	0.066
gm HC/g <sup>3</sup> CO	208	197	182	204	200	193	179	194	184	176	216	194	185	174
HC Selectivity, % wt	750°F	20	22	20	22	25	29	26	28	29	20	25	27	28
C <sub>1</sub>	16 Hr	2	2	1	3	3	4	3	3	4	2	3	3	4
C <sub>2</sub>		2	2	2	3	3	4	2	4	4	3	4	4	4
C <sub>3</sub>		8	8	5	8	8	9	8	9	9	11	10	9	9
C <sub>4</sub>		13	11	11	12	12	11	11	11	10	13	12	11	11
C <sub>5</sub>		55	51	61	52	49	43	49	45	43	51	47	46	45
Olefin Selectivity, % wt		40	40	99	33	33	29	29	29	28	34	17	29	29
C <sub>1</sub>		33	33	17	43	42	43	40	43	43	37	37	43	43
2-Pentene		62	81	82	81	81	81	81	81	81	82	82	81	81
Methylbutene														
Aromatic in C <sub>6</sub> <sup>+</sup> , % wt		1	1	0	2	2	1	2	1	2	1	2	2	2
90% OH, % <sup>+</sup>		383	383	390	382	375	373	377	375	375	387	390	382	376

TABLE D23 (Continued)  
 PROCESSING H<sub>2</sub>/CO OVER REGENERATED SG-8-1 AT 515°F AND 200 PSIG

	Cycle 9			Cycle 10			Cycle 11							
	166-1	166-2	166-3	166-4	167-1	167-2	167-3	167-4	167-5	168-1	168-2	168-3	168-4	168-5
Run CT-159--	1.0	2.0	3.0	4.0	2.0	3.0	4.1	5.1	6.0	2.1	3.1	4.1	5.1	6.1
Days On Stream														
Temperature, Inlet, °F	501	504	503	505	502	505	505	504	506	493	500	500	500	502
Average, °F	506	509	510	510	508	510	510	510	511	502	508	507	507	509
Maximum, °F	513	515	515	515	513	515	515	514	516	513	515	515	514	515
Outlet, °F	501	505	505	506	503	505	505	506	508	495	501	502	501	502
GHSV	506	506	501	519	521	519	519	519	517	527	523	526	516	514
WHSV	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Contact Time, sec.	55.6	55.8	55.5	55.9	53.8	53.8	54.1	54.1	54.2	53.3	51.6	53.3	54.4	54.5
Material Balance, % wt	98	100	99	99	98	101	99	101	102	97	102	102	102	102
CO Conversion, % wt	35	32	31	30	31	29	28	27	27	39	38	36	34	34
To HC, % wt	99	99	99	98	99	98	98	98	98	98	98	98	98	98
H <sub>2</sub> Conversion, % wt	71	69	65	63	61	63	58	59	60	78	79	77	75	75
To HC, % wt	53	56	55	56	53	56	55	58	58	57	55	56	57	58
Total Conversion, % wt	37	35	33	32	33	32	30	29	29	42	42	39	37	37
gm C <sub>1</sub> +HC/gm Catalyst/hr	0.081	0.074	0.067	0.065	0.077	0.065	0.061	0.060	0.057	0.107	0.084	0.077	0.069	0.071
gm H <sub>2</sub> /m <sup>3</sup> CO	190	183	172	170	178	163	155	154	152	234	207	194	183	191
H <sub>2</sub>														
HC Selectivity, % wt	22	25	27	28	21	27	28	29	30	19	26	27	30	30
C <sub>1</sub>	200	3	4	3	3	3	4	4	5	2	3	3	3	4
Psig	4	4	4	3	3	4	3	4	4	3	3	4	4	4
900°F	11	10	10	11	14	11	12	11	11	10	9	8	8	6
C <sub>2</sub>	11	11	11	11	14	12	12	12	10	13	12	11	12	11
C <sub>3</sub>	11	11	11	11	14	12	12	12	10	13	12	11	12	11
C <sub>4</sub>	11	11	11	11	14	12	12	12	10	13	12	11	12	11
C <sub>5</sub>	11	11	11	11	14	12	12	12	10	13	12	11	12	11
C <sub>6</sub>	50	46	45	44	45	42	41	40	40	53	48	47	43	43
Olefin Selectivity, % wt														
C <sub>2</sub>	33	29	29	17	33	33	17	29	14	34	25	29	31	25
C <sub>3</sub>	25	28	28	33	1	28	20	33	33	36	37	37	37	37
C <sub>4</sub>	47	52	53	56	52	53	56	57	56	64	65	61	64	65
C <sub>5</sub>	64	67	69	70	65	68	70	72	73	76	78	78	79	79
C <sub>5</sub> Olefin Selectivity, % wt														
1-Pentene	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2-Pentene	16	16	16	16	16	16	16	17	17	17	18	18	18	18
Methylbutenes	82	82	82	82	82	82	82	82	82	81	79	81	80	80
Aromatics in C <sub>6</sub> , % wt	2	2	2	2	2	2	2	2	2	0	0	1	1	1
90% OH, % wt	390	383	374	374	374	373	380	376	373	390	382	377	380	374

(s) 100 psig, 750°F, 1 hr burn with 1% O<sub>2</sub>, then 1 hr burn with air, H<sub>2</sub> pretreat at 600°F, 200 psig, 16 hr.

TABLE D23 (Continued)  
PROCESSING H<sub>2</sub>/CO OVER SG-B-3 AT 515°F

Run CT-159- Days On Stream	Cycle 12			Cycle 13			Cycle 14			Cycle 15			
	169-1 2.1	169-2 3.1	169-3 4.1	170-1 2.0	170-2 4.1	170-3 5.0	170-4 6.0	171-1 2.0	171-2 4.0	171-3 5.0	172-1 1.0	172-2 2.0	172-3 3.0
Temperature, Inlet, °F	496	502	502	501	504	504	506	505	507	504	499	500	503
Average, °F	505	509	508	508	511	510	513	511	513	510	507	508	510
Maximum, °F	513	515	514	514	516	515	517	515	517	514	515	514	516
Outlet, °F	498	503	504	504	506	509	509	509	507	507	504	504	506
Pressure, Psig	200	200	200	200	200	200	200	200	200	200	200	200	200
GHSV	507	507	507	519	516	516	516	550	549	537	528	523	524
WHSV	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.8
Contact Time, sec.	55.4	55.3	55.3	54.1	54.3	54.4	54.3	27.2	27.3	52.3	51.3	51.7	51.4
Material Balance, % wt	96	99	100	95	100	101	101	100	100	99	98	98	102
CO Conversion, % wt	36	34	31	33	30	28	27	21	20	25	35	32	30
To HC, % wt	99	98	98	99	98	98	98	99	99	99	99	99	98
H <sub>2</sub> Conversion, % wt	71	71	68	67	65	60	60	48	44	55	72	66	66
To HC, % wt	56	53	55	54	58	56	58	57	59	55	55	57	56
Total Conversion, % wt	38	37	34	35	32	30	29	23	21	27	37	34	33
gm HC/g CO	214	175	167	183	172	148	150	119	120	133	196	190	167
gm C <sub>3</sub> HC/gm Catalyst/hr	0.097	0.067	0.064	0.081	0.070	0.057	0.056	0.046	0.047	0.055	0.090	0.084	0.070
HC Selectivity, % wt	18	28	29	22	26	30	31	33	32	27	20	22	25
C <sub>1</sub>	2	4	3	2	3	3	4	4	4	4	2	2	3
C <sub>2</sub>	3	4	4	4	4	5	4	6	6	5	4	3	4
C <sub>3</sub>	9	10	8	11	9	9	6	11	13	11	10	9	9
C <sub>4</sub>	12	12	10	12	12	11	10	13	11	11	12	12	12
C <sub>5+</sub>	55	43	45	49	47	42	43	33	35	42	52	51	46
Olefin Selectivity, % wt	20	28	33	20	40	40	33	40	25	40	20	20	33
C <sub>2</sub>	37	37	37	28	28	29	33	28	28	28	33	28	28
C <sub>3</sub>	60	63	58	54	56	59	59	43	48	52	56	57	58
C <sub>4</sub>	73	75	76	69	72	74	75	59	62	66	70	71	72
C <sub>5</sub>													
C <sub>6</sub>													
C <sub>1</sub> Olefin Selectivity	2	2	2	2	2	2	2	2	2	2	2	2	2
1-Pentene	17	17	17	16	17	17	17	16	16	16	16	17	17
2-Pentene	81	81	81	82	81	81	81	82	82	82	82	82	81
Methylbutenes													
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	1	1	1	1	3	2	1	4	2	3	0	1	1
90% OH, °F	387	377	379	381	373	367	367	327	344	367	389	383	374

(a) 100 psig, 750°F, 1 hr burn with 1% O<sub>2</sub>, then 1 hr burn with air, H<sub>2</sub> pretreat at 600°F, 200 psig, 16 hrs.

TABLE D24

PROCESSING H<sub>2</sub>/CO OVER SG-B-3 AT 515°F AND 200 PSIG  
AFTER AN EXTENDED PRETREATMENT

(Pretreat: H<sub>2</sub>, 66 Hr, 950°F, 200 psig)

Run CT-159-109- Days On Stream	1 0.9	2 1.9	3 2.9	4 3.9
Temperature, Inlet, °F	496	496	502	503
Average, °F	495	501	502	504
Maximum, °F	512	513	514	515
Outlet, °F	483	490	493	495
GHSV	500	506	506	506
WHSV	0.7	0.7	0.7	0.7
Contact Time, sec.	56.3	55.6	55.5	55.5
Material Balance, % wt	96	97	97	98
CO Conversion, % wt	39	39	37	36
To HC, % wt	97	98	98	98
H <sub>2</sub> Conversion, % wt	87	84	81	79
To HC, % wt	56	54	54	53
Total Conversion, % wt	43	42	40	39
gm HC/m <sup>3</sup> CO	226	215	203	196
gm C <sub>3</sub> <sup>+</sup> HC/gm Catalyst/hr	0.014	0.094	0.084	0.078
HC Selectivity, % wt				
C <sub>1</sub>	19	22	26	28
C <sub>2</sub>	2	3	3	4
C <sub>3</sub>	3	3	4	4
C <sub>3</sub>	6	9	9	9
C <sub>4</sub>	13	12	12	11
C <sub>5</sub> <sup>+</sup>	57	51	47	45
C <sub>6</sub>				
Olefin Selectivity, % wt				
C <sub>2</sub>	17	28	28	25
C <sub>3</sub>	42	42	33	37
C <sub>3</sub>	61	58	60	58
C <sub>4</sub>	73	73	73	73
C <sub>5</sub>				
C <sub>5</sub> Olefin Selectivity				
1-Pentene	2	2	2	2
2-Pentene	17	17	17	17
Methylbutenes	82	81	81	81
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	1	1	1	1
90% OH, °F	379	384	378	377

TABLE D25

PROCESSING H<sub>2</sub>/CO OVER SG-B-3 AT 500°F AND 200 PSIG  
(Pretreat: H<sub>2</sub>, 16 Hr, 600°F, 200 psig)

Run CT-158- Days On Stream	Cycle 1						Cycle 2					
	110-1 0.8	110-2 1.8	110-3 2.9	110-4 3.8	110-5 5.8	110-6 6.8	111-1 1.1	111-2 2.1	111-3 3.0	111-4 5.0	111-5 6.0	111-6 7.0
Temperature, Inlet, °F	456	478	483	487	486	487	474	484	485	486	487	488
Average, °F	463	475	480	483	483	485	479	484	484	486	487	488
Maximum, °F	490	497	499	501	499	500	498	501	500	501	501	501
Outlet, °F	450	462	467	471	472	473	465	471	471	476	476	475
GHSV	481	479	480	483	487	487	507	507	509	514	517	519
WHSV	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Contact Time, sec.	59.8	59.7	59.4	58.9	58.5	58.5	56.2	56.2	56.0	55.3	55.0	54.9
Material Balance, % wt	93	100	98	98	99	99	99	102	100	101	106	110
CO Conversion, % wt	82	85	82	81	73	72	81	78	75	70	70	68
To HC, % wt	99	99	99	99	99	99	99	99	99	99	99	99
H <sub>2</sub> Conversion, % wt	84	88	86	84	79	76	84	83	79	75	73	74
To HC, % wt	53	56	56	57	58	57	56	56	57	57	55	55
Total Conversion, % wt	82	86	83	81	74	72	81	79	75	71	70	69
gm HC/m <sup>3</sup> CO	437	484	460	465	438	412	466	437	428	412	383	374
gm C <sub>3</sub> <sup>+</sup> HC/gm Catalyst/hr	0.121	0.124	0.110	0.112	0.107	0.092	0.129	0.111	0.107	0.109	0.095	0.092
HC Selectivity, % wt	H <sub>2</sub>											
C <sub>1</sub>	17	21	25	28	26	32	21	26	27	25	29	30
C <sub>2</sub>	3	3	4	4	4	4	3	4	4	4	4	4
C <sub>3</sub>	5	6	6	6	6	6	6	6	6	6	6	6
C <sub>4</sub>	7	8	7	8	10	8	9	6	8	10	9	7
C <sub>5</sub>	10	10	10	10	11	9	11	9	10	11	10	9
C <sub>6</sub> <sup>+</sup>	58	51	48	44	43	41	51	49	45	44	43	44
Olefin Selectivity, % wt	H <sub>2</sub>											
C <sub>2</sub>	6	2	3	5	10	6	7	8	11	9	7	4
C <sub>3</sub>	18	22	23	13	17	16	10	12	9	17	16	15
C <sub>4</sub>	54	51	52	50	51	52	42	45	45	48	50	50
C <sub>5</sub>	65	64	64	64	65	65	59	61	62	63	64	65
C <sub>5</sub> Olefin Selectivity, % wt	H <sub>2</sub>											
1-Pentene	4	4	4	4	4	4	2	3	3	3	3	3
2-Pentene	35	37	37	35	34	32	22	25	27	27	27	27
Methylbutenes	61	59	60	61	62	63	76	72	70	70	71	70
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	0	0	0	0	0	0	0	0	0	0	0	0
90% OH, °F	462	448	428	419	408	395	428	408	404	395	394	393

TABLE D25 (Continued)

PROCESSING  $H_2/CO$  OVER SG-B-3 AT 500°F AND 200 PSIG

(Pretreat:  $H_2$ , 16 Hr, 600°F, 200 psig)

Run CT-158- Days On Stream	Cycle 3			Cycle 4			Cycle 5			Cycle 6					
	112-1 2.0	112-2 4.0	112-3 5.1	112-4 6.1	112-5 7.1	113-1 1.0	113-2 3.1	113-3 4.1	113-4 5.0	114-1 1.1	114-2 2.1	114-3 3.1	115-1 1.0	115-2 2.0	115-3 3.0
Temperature, Inlet, °F	482	486	486	489	489	R	484	486	487	489	R	484	488	489	490
Temperature, Inlet, °F	484	488	488	489	488	E	486	488	488	488	E	488	488	488	486
Temperature, Inlet, °F	498	501	498	501	500	G	499	500	501	501	G	500	500	500	500
Temperature, Inlet, °F	468	474	473	476	476	E	473	475	477	477	E	475	477	477	471
Temperature, Inlet, °F	514	510	516	512	509	N	520	513	516	517	N	517	517	507	506
Temperature, Inlet, °F	0.5	0.5	0.5	0.5	0.5	E	0.5	0.5	0.5	0.5	E	0.5	0.5	0.5	0.5
Temperature, Inlet, °F	55.5	55.8	55.3	55.6	56.0	R	54.8	55.5	55.2	55.0	R	55.1	54.6	55.3	56.3
Temperature, Inlet, °F	99	104	110	99	102	A	106	101	100	101	A	97	97	97	97
Temperature, Inlet, °F	72	65	65	60	60	I	64	59	60	60	I	65	63	59	75
Temperature, Inlet, °F	100	100	100	99	99	O	99	100	99	99	O	100	100	99	99
Temperature, Inlet, °F	76	75	70	67	66	N	77	69	66	65	N	71	68	63	80
Temperature, Inlet, °F	56	60	54	58	57	H <sub>2</sub>	54	59	58	56	H <sub>2</sub>	57	57	55	55
Temperature, Inlet, °F	200 psig	73	66	61	61	200 psig	73	65	60	60	200 psig	66	64	59	76
Temperature, Inlet, °F	700°F	414	390	341	340	800°F	387	384	344	328	800°F	377	363	312	434
Temperature, Inlet, °F	0.115	0.101	0.086	0.076	0.080	0.105	0.101	0.101	0.083	0.079	0.101	0.083	0.137	0.116	0.116
Temperature, Inlet, °F	21	25	28	34	31	16 Hrs	23	24	31	31	16 Hrs	24	28	30	25
Temperature, Inlet, °F	3	3	4	5	4	4	4	4	4	4	4	4	4	4	2
Temperature, Inlet, °F	5	6	5	6	6	5	5	5	6	6	5	6	6	6	2
Temperature, Inlet, °F	10	10	7	7	9	8	10	8	9	9	8	10	9	6	5
Temperature, Inlet, °F	11	11	10	9	10	12	12	10	10	10	11	11	11	10	6
Temperature, Inlet, °F	49	45	46	40	40	48	45	45	40	41	47	43	53	52	47
Temperature, Inlet, °F	9	10	9	14	9	4	10	10	10	5	5	5	3	3	3
Temperature, Inlet, °F	9	10	10	10	11	17	15	22	11	25	25	17	14	17	14
Temperature, Inlet, °F	39	43	45	44	46	36	40	44	44	38	39	38	36	39	39
Temperature, Inlet, °F	55	60	63	63	63	50	56	60	61	49	53	54	53	53	54
Temperature, Inlet, °F	2	2	2	3	2	2	2	2	2	2	2	2	2	2	3
Temperature, Inlet, °F	20	21	23	23	23	18	19	19	20	17	18	18	22	24	24
Temperature, Inlet, °F	79	76	75	75	75	80	79	79	78	81	80	80	76	73	73
Temperature, Inlet, °F	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0
Temperature, Inlet, °F	398	390	391	390	383	397	391	389	385	391	384	387	427	425	415

(a) 100 psig, 750°F, 1 hr burn with 1%  $O_2$  then 1 hr burn with air;  $H_2$  pretreat at 600°F, 200 psig, 16 hrs.

TABLE D26

PROCESSING 2H<sub>2</sub>/CO OVER CATALYST SG-B-3 AT 200 PSIG  
(Pretreatment: H<sub>2</sub>, 600°F, 200 psig, 16 Hr)

Run CT-159- Days On Stream Cumulative Days On Stream	174-1 0.7	174-2 2.7	174-3 3.7	175-1 1.0	175-2 2.0	175-3 3.0	175-4 5.0	176-1 1.0	176-2 2.0	176-3 3.0
Temperature, Inlet, °F	461	470	474	471	475	476	479	474	480	480
Average, °F	473	482	485	483	486	488	489	486	490	489
Maximum, °F	492	498	502	498	499	501	501	499	502	500
Outlet, °F	461	471	476	473	477	480	481	477	482	482
GHSV	534	540	529	529	546	521	527	517	530	546
WHSV	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6
Contact Time, sec.	53.8	52.9	53.9	54.0	52.2	54.6	54.0	55.1	53.6	52.2
Material Balance, % wt	93	99	99	97	96	97	99	98	102	99
CO Conversion, % wt	86	84	83	83	79	79	73	76	74	67
To HC, % wt	99	99	99	99	99	99	99	99	99	99
H <sub>2</sub> Conversion, % wt	88	86	85	85	82	83	78	83	81	74
To HC, % wt	52	56	53	53	54	55	57	55	56	57
Total Conversion, % wt	86	84	83	83	80	80	73	77	75	68
gm HC/m <sup>3</sup> CO	547	511	462	460	448	451	433	422	422	386
gm C <sub>3</sub> + HC/gm Catalyst/Hr	0.141	0.159	0.132	0.137	0.133	0.124	0.124	0.124	0.119	0.109
HC Selectivity, % wt	19	18	23	20	23	25	23	20	24	26
C <sub>1</sub>	3	3	3	3	3	4	3	3	3	4
C <sub>2</sub>	5	5	6	5	5	5	5	4	5	5
C <sub>3</sub>	5	8	9	6	6	6	10	6	8	6
C <sub>4</sub>	9	11	10	8	10	10	12	10	11	9
C <sub>5</sub> <sup>+</sup>	60	56	49	57	52	52	47	56	49	51
Olefin Selectivity, % wt	5	6	5	8	6	6	8	7	10	9
C <sub>2</sub>	23	23	26	19	24	23	26	20	13	20
C <sub>3</sub>	49	55	54	46	51	51	55	48	49	52
C <sub>4</sub>	64	64	65	60	63	63	66	62	64	66
C <sub>5</sub>										
C <sub>5</sub> Olefin Selectivity	3	5	5	3	4	3	3	3	3	3
1-Pentene	36	45	46	25	31	32	33	21	23	26
2-Pentene	61	50	49	72	66	64	64	76	74	71
Methylbutenes										
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	1	0	0	0	0	0	0	0	0	0
90% OH, °F	449	445	436	423	403	394	414	427	420	430

TABLE D26 (Continued)

PROCESSING 2H<sub>2</sub>/CO OVER CATALYST SG-B-3 AT 200 PSIG  
(Pretreatment: H<sub>2</sub>, 600°F, 200 psig, 16 Hr)

Run RT-159- Days On Stream Cumulative Days On Stream	177-1 2.0 13.7	177-2 3.0 14.7	177-3 4.0 15.7	178-1 0.8 16.5	178-2 1.8 17.5	178-3 2.8 18.5	178-4 4.9 20.6	179-1 0.9 21.5	179-2 1.9 22.5	180-1 1.1 23.6	180-2 2.0 24.5	180-3 4.1 26.6	180-4 6.1 28.6
Temperature, Inlet, °F	477	482	483	481	482	484	485	479	484	488	491	494	494
Average, °F	480	492	493	489	491	493	493	490	494	498	502	503	503
Maximum, °F	500	501	501	502	500	501	500	498	501	511	511	512	511
Outlet, °F	481	485	487	483	486	488	489	484	488	491	495	497	497
GHSV	553	529	530	484	511	520	527	480	514	496	511	530	546
WHSV	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Contact Time, sec	51.5	53.8	53.7	56.7	55.7	54.7	54.0	59.5	55.3	56.9	55.1	53.1	51.6
Material Balance, % wt	98	95	99	94	98	97	97	99	99	97	97	98	100
CO Conversion, % wt	71	69	66	77	68	69	65	72	69	77	72	68	60
To HC, % wt	99	99	99	99	99	99	99	99	99	99	99	99	99
H <sub>2</sub> Conversion, % wt	77	74	72	82	72	71	68	75	72	81	75	72	65
To HC, % wt	56	55	56	53	55	54	55	51	54	53	53	56	57
Total Conversion, % wt	72	70	67	77	68	70	66	72	70	78	73	69	61
gm HC/m <sup>3</sup> CO	421	392	370	408	385	399	386	371	397	419	391	406	365
gm C <sub>3</sub> + HC/Catalyst/hr	0.133	0.108	0.099	0.108	0.109	0.106	0.105	0.093	0.106	0.109	0.098	0.107	0.094
HC Selectivity, % wt	20	25	27	23	23	26	26	25	26	25	29	28	31
C <sub>1</sub>	3	4	4	3	3	4	4	4	4	4	4	4	5
C <sub>2</sub>	5	5	5	4	5	6	5	5	5	5	5	5	6
C <sub>3</sub>	9	8	7	6	8	9	10	6	8	6	6	9	9
C <sub>4</sub>	11	11	10	9	11	11	12	10	11	11	11	11	10
C <sub>5</sub>	52	48	47	54	49	45	43	49	47	49	45	42	39
Olefin Selectivity, % wt	9	8	8	7	9	11	5	4	8	6	7	8	9
C <sub>2</sub>	24	21	18	18	10	11	25	19	16	9	14	5	23
1-Pentene	47	51	51	41	44	44	48	39	40	32	38	38	43
2-Pentene	61	64	65	56	60	60	62	53	56	48	51	55	59
Methylbutenes	3	2	3	2	2	2	2	2	2	2	2	2	2
C <sub>5</sub> Olefin Selectivity	20	23	23	17	18	19	20	17	16	16	17	16	16
1-Pentene	77	75	74	80	80	79	78	81	81	82	81	82	82
2-Pentene	0	0	0	0	0	0	0	0	0	0	0	0	0
Aromatics in C <sub>6</sub> +, % wt	420	415	412	420	408	406	393	410	403	395	390	384	382
90% OH, °F													



TABLE D27

PROCESSING 2H<sub>2</sub>/CO OVER CATALYST SG-B-1 AT 500°F AND 200 PSIG  
(Pretreatment: H<sub>2</sub>, 600°F, 200 psig, 16 Hr)

Run CT-15g- Days On Stream Cumulative Days On Stream	116-1	116-2	116-3	116-4	117-1	117-2	117-3	118-1	118-2	118-3	118-4	119-1	119-2	119-3	R(A)
Temperature, Inlet, °F	456	473	474	478	471	478	478	475	479	481	483	475	480	483	E
Average, °F	469	477	479	482	477	482	483	480	484	485	487	481	485	487	G
Maxima, °F	484	497	498	500	496	500	500	499	500	500	501	498	499	500	E
Outlet, °F	453	461	464	466	461	467	469	466	472	472	474	468	472	476	E
CHSV	529	523	520	524	526	524	523	533	530	530	529	524	523	524	R
WHSV	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	A
Contact Time, sec	54.2	54.6	54.9	54.3	54.4	54.3	54.5	53.5	53.7	53.7	53.8	54.4	54.5	54.3	T
Material Balance, % wt	99	101	102	105	102	104	104	104	105	102	102	102	102	102	I
CO Conversion, % wt	82	79	78	73	75	73	70	68	67	62	62	73	68	66	O
To HC, % wt	99	99	99	99	99	99	99	99	99	99	99	100	100	99	N
R <sub>1</sub> Conversion, % wt	87	86	85	81	82	81	78	77	75	71	70	73	68	67	H <sub>2</sub>
To RC, % wt	57	58	59	60	59	59	60	61	59	60	60	51	52	52	18 O <sub>2</sub>
Total Conversion, % wt	82	80	79	74	76	74	71	69	68	64	64	73	68	66	200
gm HC/m <sup>3</sup> CO	459	452	456	437	432	425	402	409	383	366	360	414	398	373	psig
gm C <sub>3</sub> + HC/gm Catalyst/Hr	0.134	0.130	0.127	0.123	0.126	0.119	0.108	0.120	0.105	0.095	0.092	0.121	0.115	0.097	700°F
HC Selectivity, % wt	18	19	20	21	18	21	24	19	23	26	27	20	21	27	16 Hr
C <sub>1</sub>	3	3	3	3	3	3	3	3	3	4	4	3	3	4	16 Hr
C <sub>2</sub>	5	5	5	6	5	5	5	5	5	5	5	5	5	6	16 Hr
C <sub>3</sub>	7	8	9	9	9	9	7	9	8	9	9	6	10	6	16 Hr
C <sub>4</sub>	10	12	11	11	12	11	10	11	11	11	11	11	12	10	16 Hr
C <sub>5</sub>	57	53	52	49	54	51	50	53	49	46	45	55	49	46	16 Hr
Olefin Selectivity, % wt	7	7	7	8	8	8	8	10	9	15	11	12	10	9	16 Hr
C <sub>1</sub>	27	29	27	33	25	21	31	27	31	21	21	27	27	15	16 Hr
C <sub>2</sub>	57	58	58	59	52	54	56	51	53	54	55	42	48	49	16 Hr
C <sub>3</sub>	67	69	69	70	66	67	68	65	67	68	69	58	62	64	16 Hr
C <sub>5</sub> Olefin Selectivity	5	5	5	5	3	3	3	3	3	3	3	3	3	3	16 Hr
1-Pentene	41	46	45	45	27	31	33	27	29	29	28	20	23	23	16 Hr
2-Pentene	55	49	50	51	70	66	63	71	68	68	69	77	75	74	16 Hr
Methylbutenes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16 Hr
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	464	436	422	432	431	437	441	438	427	415	412	427	415	410	16 Hr
90% OR, °F															750°F

(A) H<sub>2</sub> treat for 1 Hr at 700°F, 200 psig following 18 O<sub>2</sub> regeneration.

TABLE D27 (Continued)

PROCESSING 2H<sub>2</sub>/CO OVER CATALYST SG-B-3 AT 500°F AND 200 PSIG  
(Pretreatment: H<sub>2</sub>, 600°F, 200 psig, 16 Hr)

	120-1	120-2	120-3	120-4	120-5	120-6	120-7	121-1	121-2	121-3	121-4	121-
Run CT-158-												
Days On Stream	0.8	1.8	2.8	3.8	5.8	7.8	8.8	0.9	1.8	3.9	4.9	5.
Cumulative Days On Stream	17.9	18.9	19.9	20.9	22.9	24.9	25.9	26.8	27.7	29.8	30.8	31.
Temperature, Inlet, °F	464	472	475	478	480	481	482	464	475	477	481	484
Average, °F	473	479	482	485	485	486	486	474	482	482	485	487
Maximum, °F	496	499	499	501	501	500	500	496	501	497	499	501
Outlet, °F	456	463	466	470	471	472	473	456	466	468	472	474
GHSV	530	529	530	531	531	533	533	511	521	524	523	527
WHSV	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.
Contact Time, sec	54.0	53.9	53.8	53.5	53.5	53.4	53.4	55.9	54.6	54.5	54.5	54.
Material Balance, % wt	97	99	99	99	99	101	97	96	100	100	102	101
CO Conversion, % wt	83	80	77	76	71	64	63	80	79	70	70	65
To HC, % wt	99	99	99	99	99	99	99	100	99	100	99	99
H <sub>2</sub> Conversion, % wt	84	85	80	79	74	67	65	82	82	73	72	72
To HC, % wt	53	56	56	56	57	56	53	54	57	58	55	58
Total Conversion, % wt	83	81	77	77	71	64	63	81	80	70	70	66
gm HC/m <sup>3</sup> CO	445	459	442	441	418	366	342	444	450	417	375	370
gm C <sub>3</sub> + HC/gm Catalyst/Hr	0.137	0.132	0.126	0.124	0.119	0.103	0.086	0.134	0.126	0.119	0.100	0.
HC Selectivity, % wt												
C <sub>1</sub>	17	21	22	23	22	24	31	17	20	20	25	26
C <sub>2</sub>	2	3	3	3	3	3	4	2	3	3	3	4
C <sub>3</sub>	5	5	6	6	5	6	6	5	5	5	5	6
C <sub>4</sub>	5	6	8	8	10	10	7	7	8	11	7	8
C <sub>5</sub>	10	10	10	10	11	11	9	10	10	13	10	10
C <sub>6</sub>	61	55	51	50	49	47	42	59	53	49	50	46
Olefin Selectivity, % wt												
C <sub>2</sub>	7	7	8	7	5	11	10	8	7	10	9	10
C <sub>3</sub>	20	16	17	12	25	26	17	15	8	18	21	24
C <sub>4</sub>	43	46	48	47	50	53	51	43	42	49	48	48
C <sub>5</sub>	57	58	60	60	62	65	65	57	56	60	61	61
C <sub>5</sub> Olefin Selectivity												
1-Pentene	3	4	3	3	4	3	4	3	4	4	4	3
2-Pentene	27	33	35	33	32	30	28	26	29	30	27	26
Methylbutenes	70	63	62	64	64	67	68	71	68	66	70	71
Aromatics in C <sub>6</sub> +, % wt	0	0	0	0	0	0	0	0	0	0	0	0
90% OH, °F	462	462	456	442	429	420	406	462	448	448	440	460

(A) H<sub>2</sub> treat for 1 Hr at 700°F, 200 psig following 1% O<sub>2</sub> regeneration.

TABLE D27 (Continued)

PROCESSING 2M<sub>2</sub>/CO OVER CATALYST SG-B-3 AT 500°F AND 200 PSIG

(Pretreatment: H<sub>2</sub>, 600°F, 200 psig, 16 Hr)

Run CR-158- Days On Stream Cumulative Days On Stream	122-1 0.8 32.5	122-2 1.8 34.5	122-3 2.8 37.5	122-4 4.9 42.4	122-5 8.8 51.2	123-1 1.1 52.3	123-2 2.0 54.3	123-3 3.0 57.3	124-1 0.8 58.1	124-2 2.8 60.9	124-3 3.8 64.7	124-4 4.8 69.5	125-1 1.0 70.5	125-2 2.0 72.5	125-3 3.0 75.5	125-4 4.0 79.5
Temperature, Inlet, °F	470	478	480	482	484	480	486	488	475	482	487	487	479	484	485	485
Average, °F	475	482	483	484	485	484	488	489	481	484	487	487	482	489	488	487
Maximum, °F	491	501	500	499	499	501	502	502	499	498	502	500	498	501	499	497
Outlet, °F	460	467	469	471	474	471	474	476	476	476	477	476	469	474	475	475
CHSV	518	523	520	520	523	527	527	527	527	517	517	517	519	517	517	517
WHSV	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Contact Time, sec	55.6	54.4	54.8	54.8	54.8	54.1	54.0	53.9	54.1	55.3	55.0	55.1	55.0	55.0	55.1	55.1
Material Balance, % wt	101	101	102	101	101	99	100	101	101	97	99	100	97	99	98	98
CO Conversion, % wt	78	74	70	64	64	68	65	59	73	61	59	53	69	69	58	47
To HC, % wt	100	99	99	99	99	100	100	99	100	100	100	99	100	99	100	100
H <sub>2</sub> Conversion, % wt	81	79	75	67	67	72	88	64	77	65	65	62	75	75	63	52
To HC, % wt	55	57	57	56	56	56	56	58	56	56	54	57	55	55	56	56
Total Conversion, % wt	78	75	71	64	64	68	65	59	74	61	60	54	70	69	59	48
gm HC/gm CO	100	422	419	380	380	370	358	376	400	355	320	300	382	382	339	259
psig	0.122	0.118	0.101	0.103	0.103	0.103	0.098	0.087	0.115	0.108	0.088	0.078	0.118	0.108	0.096	0.069
HC Selectivity, % wt	750°F	750°F	750°F	750°F	750°F	750°F	750°F	750°F	750°F	750°F	750°F	750°F	750°F	750°F	750°F	750°F
C <sub>1</sub>	18	21	24	22	23	22	23	27	19	18	25	28	18	23	21	27
C <sub>2</sub>	2	3	3	3	3	3	3	3	3	2	3	4	3	3	3	3
C <sub>3</sub>	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
C <sub>4</sub>	7	8	7	8	8	7	8	8	7	10	8	8	8	6	11	9
C <sub>5</sub>	10	11	10	11	11	10	11	9	8	12	9	9	10	11	11	11
C <sub>6</sub>	58	52	52	50	50	54	50	47	60	51	49	46	56	52	48	45
Olefin Selectivity, % wt	13	13	10	13	13	17	17	13	15	24	13	21	16	14	15	30
1-Pentene	7	7	20	20	3	4	4	16	1	9	20	9	6	6	16	12
2-Pentene	40	42	44	46	36	35	36	40	35	43	44	46	41	39	45	49
Methylbutenes	56	57	58	60	54	52	54	56	53	58	59	60	58	57	61	63
C <sub>5</sub> Olefin Selectivity	3	2	3	3	3	3	2	2	2	2	3	2	3	3	3	3
Aromatics in C <sub>6</sub> , % wt	21	24	24	23	23	16	17	17	18	20	19	18	20	21	21	21
90% OH, °F	76	74	72	75	75	81	81	81	80	78	79	80	77	76	76	76
Aromatics in C <sub>6</sub> , % wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90% OH, °F	423	422	427	425	422	422	409	408	416	425	420	406	425	422	407	403

(A) H<sub>2</sub> treat for 1 hr at 700°F, 200 psig following 1% O<sub>2</sub> regeneration.  
 (B) H<sub>2</sub> treat for one hour at 700°F, 200 psig following regeneration.

TABLE D28

PROCESSING A H<sub>2</sub>/CO CHARGE OVER SG-B-3 AT  
515°F AND 200 PSIG-CYCLE 1

(Pretreat: H<sub>2</sub>, 16 Hr, 600°F, 200 psig)

	1	2	3	4	5	6
Run CT-159-149- Days On-Stream	1.0	1.9	2.9	3.9	5.9	6.9
Temperature, Inlet, °F	476	499	498	498	502	502
Average, °F	490	496	498	497	500	501
Maximum, °F	512	516	515	514	517	517
Outlet, °F	474	483	484	485	488	489
Pressure, psig	200	200	200	200	200	200
GHSV	470	530	537	540	539	540
WHSV	0.7	0.8	0.8	0.8	0.8	0.8
Contact Time, sec	59.8	52.9	52.2	52.0	52.0	52.1
Material Balance, % wt	98	102	100	100	102	102
CO Conversion, % wt	42	39	38	37	37	36
To HC, % wt	97	97	97	97	97	97
H <sub>2</sub> Conversion, % wt	90	84	81	80	80	79
To HC, % wt	53	56	55	56	58	55
Total Conversion, % wt	45	43	41	40	40	39
gm HC/m <sup>3</sup> CO	210	222	211	209	221	200
gm C <sub>3</sub> +HC/gm Catalyst/hr	0.088	0.105	0.100	0.098	0.103	0.088
HC Selectivity, % wt						
C <sub>1</sub>	19	19	20	21	21	25
C <sub>2</sub>	3	3	3	3	3	3
C <sub>3</sub>	3	3	3	4	5	5
C <sub>4</sub>	8	7	8	8	10	9
C <sub>5</sub>	12	11	12	11	12	11
C <sub>6</sub> <sup>+</sup>	56	56	54	53	49	48
Olefin Selectivity, % wt						
C <sub>2</sub>	29	29	29	29	26	28
C <sub>3</sub>	43	55	62	66	63	69
C <sub>4</sub>	67	71	72	76	78	77
C <sub>5</sub>	81	82	83	84	84	85
C <sub>5</sub> Olefin Selectivity						
1-Pentene	2	2	3	3	3	3
2-Pentene	20	21	24	26	28	29
Methylbutenes	78	77	74	71	69	67
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	1	1	0	0	0	0
90%, OH, °F	424	412	404	408	406	411

TABLE D29

PROCESSING A H<sub>2</sub>/CO CHARGE OVER REGENERATED SG-B-3  
 AT 515°F AND 200 PSIG-CYCLE 2  
 (Regeneration: Air, 1 Hr, 750°F, 100 psig)  
 (Pretreat: H<sub>2</sub>, 16 Hr, 600°F, 200 psig)

Run CT-159-150- Days On-Stream	1 0.8	2 1.8	3 2.8	4 4.8	5 5.8	6 6.8	7 7.8
Temperature, Inlet, °F	489	495	499	497	499	500	501
Average, °F	488	495	498	499	501	502	502
Maximum, °F	510	513	514	515	516	515	515
Outlet, °F	474	482	485	489	490	491	491
Pressure, psig	200	200	200	200	200	200	200
GHSV	514	516	509	501	503	503	504
WHSV	0.8	0.8	0.8	0.7	0.7	0.7	0.7
Contact Time, sec	54.8	54.5	55.2	55.9	55.7	55.8	55.6
Material Balance, % wt	96	98	97	99	100	96	98
CO Conversion, % wt	40	42	40	40	39	38	37
To HC, % wt	98	97	97	97	97	97	97
H <sub>2</sub> Conversion, % wt	87	88	87	84	84	82	81
To HC, % wt	52	56	54	56	54	53	55
Total Conversion, % wt	43	45	43	43	42	41	40
gm HC/m <sup>3</sup> CO	199	232	216	234	212	196	196
gm C <sub>3</sub> +HC/gm Catalyst/hr	0.094	0.110	0.096	0.104	0.089	0.080	0.078
HC Selectivity, % wt							
C <sub>1</sub>	18	18	22	21	25	27	22
C <sub>2</sub>	2	2	3	3	3	3	4
C <sub>3</sub>	4	4	4	4	4	5	5
C <sub>4</sub>	8	8	8	10	8	9	8
C <sub>5</sub>	12	12	10	11	10	10	10
C <sub>6</sub> +	57	56	52	50	50	46	45
Olefin Selectivity, % wt							
C <sub>2</sub>	33	28	25	27	25	29	25
C <sub>3</sub>	66	59	63	62	69	63	59
C <sub>4</sub>	72	74	74	75	77	78	75
C <sub>5</sub>	83	83	83	84	84	84	84
C <sub>5</sub> Olefin Selectivity							
1-Pentene	3	3	3	3	3	3	3
2-Pentene	23	24	27	27	29	29	29
Methylbutenes	75	73	70	70	68	68	68
Aromatics in C <sub>6</sub> +, % wt	0	0	0	0	0	0	0
90%, OH, °F	430	425	418	410	415	404	400

TABLE D30

PROCESSING A H<sub>2</sub>/CO CHARGE OVER REGENERATED SG-B-3  
AT 515°F AND 200 PSIG-CYCLE 3

(Regeneration: Air, 1 Hr, 750°F, 100 psig)  
(Pretreat: H<sub>2</sub>, 16 Hr, 600°F, 200 psig)

Run CT-159-151- Days On-Stream	1	2	3	4	5	6
	0.8	2.8	3.9	4.9	5.8	6.8
Temperature, Inlet, °F	491	500	502	500	501	502
Average, °F	491	501	502	500	504	506
Maximum, °F	508	515	515	512	515	516
Outlet, °F	478	490	493	488	494	496
Pressure, psig	200	200	200	200	200	200
GHSV	521	534	537	539	531	540
WHSV	0.8	0.8	0.8	0.8	0.8	0.8
Contact Time, sec	54.2	52.5	52.2	52.2	52.8	51.9
Material Balance, % wt	92	98	100	108	104	102
CO Conversion, % wt	39	40	37	39	36	37
To HC, % wt	98	97	97	98	97	97
H <sub>2</sub> Conversion, % wt	83	81	80	80	80	81
To HC, % wt	51	54	55	53	56	57
Total Conversion, % wt	42	43	40	42	39	40
gm HC/m <sup>3</sup> CO	196	235	207	225	196	202
gm C <sub>3</sub> +HC/gm Catalyst/hr	0.094	0.115	0.093	0.107	0.080	0.084
HC Selectivity, % wt						
C <sub>1</sub>	19	20	25	21	28	28
C <sub>2</sub>	2	2	3	3	4	4
C <sub>3</sub>	3	3	3	3	4	4
C <sub>4</sub>	8	9	7	6	8	8
C <sub>5</sub>	11	13	10	8	11	11
C <sub>6</sub> <sup>+</sup>	56	52	52	60	46	46
Olefin Selectivity, % wt						
C <sub>2</sub>	33	29	29	29	25	22
C <sub>3</sub>	50	49	50	57	55	50
C <sub>4</sub>	70	70	70	70	71	71
C <sub>5</sub>	81	82	82	84	83	83
C <sub>5</sub> Olefin Selectivity						
1-Pentene	2	2	3	2	2	2
2-Pentene	18	19	20	21	22	21
Methylbutenes	80	79	78	77	75	76
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	0	0	0	1	1	1
90% OH, °F	412	393	395	404	390	390

TABLE D31

PROCESSING A H<sub>2</sub>/CO CHARGE OVER REGENERATED SG-B-3  
AT 515°F AND 200 PSIG-CYCLE 4

(Regeneration: Air, 1 Hr, 750°F, 100 psig)  
(Pretreat: H<sub>2</sub>, 16 Hr, 600°F, 200 psig)

Run CT-159-157-	1	2
Days On-Stream	0.8	1.8
Temperature, Inlet, °F	509	507
Average, °F	512	511
Maximum, °F	516	513
Outlet, °F	506	507
Pressure, psig	200	200
GHSV	503	507
WHSV	0.7	0.8
Contact Time, sec	55.7	55.4
Material Balance, % wt	95	98
CO Conversion, % wt	39	36
To HC, % wt	97	97
H <sub>2</sub> Conversion, % wt	85	80
To HC, % wt	51	54
Total Conversion, % wt	42	39
gm HC/m <sup>3</sup> CO	186	196
gm C <sub>3</sub> <sup>+</sup> HC/gm Catalyst/hr	0.076	0.081
HC Selectivity, % wt		
C <sub>1</sub>	27	27
C <sub>2</sub>	3	3
C <sub>3</sub>	3	3
C <sub>4</sub>	9	8
C <sub>5</sub> <sup>+</sup>	12	12
C <sub>6</sub>	46	48
Olefin Selectivity, % wt		
C <sub>2</sub>	33	33
C <sub>3</sub>	28	42
C <sub>4</sub>	56	60
C <sub>5</sub>	71	75
C <sub>5</sub> Olefin Selectivity		
1-Pentene	2	2
2-Pentene	17	18
Methylbutenes	81	80
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	1	1
90% OH, °F	398	393

TABLE D32

PROCESSING 2H<sub>2</sub>/CO OVER SG-R-3 AT 500°F AND 200 PSIG  
(Pretreatment: H<sub>2</sub>, 600°F, 200 psig, 16 Hr)

Run No. CT-159- Days On Stream Cumulative Days On Stream	181-1 1.0 1.0	181-2 2.0 2.0	181-3 4.0 4.0	181-4 5.0 5.0	182-1 0.9 5.9	182-2 1.9 6.9	182-3 2.9 7.9	182-4 3.8 8.8	182-5 5.8 10.8	183-1 0.9 11.7	183-2 1.9 12.7	183-3 2.9 13.7
Temperature, Inlet, °F	484	487	487	489	481	485	487	487	487	484	487	489
Average, °F	487	490	491	494	483	490	491	492	493	486	491	493
Maximum, °F	500	501	501	502	497	500	500	500	500	499	501	502
Outlet, °F	473	475	478	481	470	476	478	478	480	474	478	481
GHSV	497	516	523	531	460	511	527	536	516	479	511	510
WHSV	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Contact Time, sec	57.3	55.2	54.4	53.5	62.2	55.7	54.0	53.2	55.2	59.6	55.6	55.7
Material Balance, % wt	98	98	99	98	96	100	100	99	98	98	100	101
CO Conversion, % wt	91	88	84	82	93	90	86	84	83	88	83	80
To HC, % wt	97	97	98	98	96	97	97	98	98	98	98	98
H <sub>2</sub> Conversion, % wt	93	91	87	85	94	92	91	88	87	91	88	85
To HC, % wt	55	55	57	56	54	57	57	57	57	55	56	56
Total Conversion, % wt	92	88	84	83	93	90	87	85	84	88	84	81
gm HC/m <sup>3</sup> CO	506	483	501	465	472	506	489	482	479	479	457	452
gm C <sub>3</sub> HC/gm Catalyst/hr	0.133	0.129	0.142	0.119	0.113	0.134	0.131	0.130	0.126	0.118	0.114	0.115
HC Selectivity, % wt	24	26	24	30	25	25	27	28	27	26	29	28
C <sub>1</sub>	4	4	3	4	4	4	4	4	4	4	4	4
C <sub>2</sub>	5	6	6	6	5	6	6	6	6	5	6	7
C <sub>3</sub>	5	6	10	6	5	6	6	6	9	5	6	9
C <sub>4</sub>	9	9	12	9	9	9	10	10	10	8	9	10
C <sub>5</sub> + C <sub>6</sub>	54	49	45	45	52	51	47	47	44	53	46	43
Olefin Selectivity, % wt	2	2	5	5	4	4	4	7	5	6	5	8
C <sub>2</sub>	13	18	21	20	12	14	17	18	19	13	20	13
C <sub>3</sub>	45	48	51	53	40	46	49	50	51	49	51	50
C <sub>4</sub>	58	60	62	62	53	56	59	60	61	57	59	61
C <sub>5</sub>												
C <sub>5</sub> Olefin Selectivity	3	3	4	4	3	3	5	5	4	5	4	4
1-Pentene	2	30	32	32	24	33	36	37	36	41	40	37
2-Pentene	75	67	64	64	72	61	59	58	60	54	56	60
Methylbutenes												
Aromatics in C <sub>6</sub> +, % wt	0	0	0	0	0	0	0	0	0	0	0	0
90% OH, °F	438	426	424	425	439	421	437	428	422	443	437	421

H<sub>2</sub> treat for one hour at 200 psig following regeneration at  
(a) 600°F  
(b) 525°F



TABLE D12 (Continued)

PROCESSING 2H<sub>2</sub>/CO OVER SG-B-3 AT 500°F AND 200 PSIG  
(Pretreatment: H<sub>2</sub>, 600°F, 200 psig, 16 Hr)

Run No. CT-159- Days On Stream Cumulative Days On Stream	184-1 0.8 14.5	184-2 1.8 15.5	184-3 3.8 17.5	184-4 4.8 18.5	185-1 0.9 19.4	185-2 1.8 20.3	185-3 2.8 21.3	186-1 0.8 22.1	186-2 2.9 24.2	186-3 3.8 25.1	186-4 4.8 26.1
Temperature, Inlet, °F	484	489	489	489	484	489	489	486	487	489	489
Average, °F	489	494	494	494	488	494	494	492	493	495	494
Maximum, °F	500	502	501	500	498	501	500	500	500	500	500
Outlet, °F	475	481	483	483	476	481	483	479	481	484	485
CHSV	510	536	537	539	511	541	537	534	557	519	514
WHSV	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5
Contact Time, sec	55.8	53.0	53.0	52.9	55.8	52.5	53.0	53.3	51.1	54.9	55.4
Material Balance, % wt	97	98	98	102	96	99	98	96	100	100	102
CO Conversion, % wt	84	80	75	70	79	75	72	75	67	65	62
To HC, % wt	99	99	99	99	99	99	99	99	99	99	99
H <sub>2</sub> Conversion, % wt	87	85	79	75	84	80	76	79	71	70	68
To HC, % wt	53	56	57	55	53	56	56	53	56	56	57
Total Conversion, % wt	84	81	76	70	80	76	72	76	68	66	63
gm HC/m <sup>3</sup> CO	440	448	448	384	398	429	405	394	393	360	351
gm C <sub>3</sub> + HC/gm Catalyst/Hr	0.120	0.127	0.129	0.102	0.108	0.122	0.108	0.114	0.121	0.096	0.088
HC Selectivity, % wt	24	25	24	29	24	25	27	24	20	27	29
C <sub>1</sub>	3	3	3	4	3	3	4	3	3	3	4
C <sub>2</sub>	5	5	5	5	5	4	5	5	5	5	5
C <sub>3</sub>	5	5	9	8	5	6	8	7	10	8	7
C <sub>4</sub>	8	8	10	9	8	9	10	10	12	10	10
C <sub>5</sub> + C <sub>6</sub>	56	53	49	45	54	53	47	51	50	46	46
Olefin Selectivity, % wt											
C <sub>2</sub>	8	6	9	8	7	7	12	8	17	16	15
C <sub>3</sub>	13	14	21	26	16	3	6	10	10	4	4
C <sub>4</sub>	43	46	49	51	37	39	42	33	40	42	40
C <sub>5</sub>	58	60	62	65	52	56	59	47	55	58	59
C <sub>5</sub> Olefin Selectivity											
1-Pentene	3	3	2	3	2	2	2	2	2	2	2
2-Pentene	17	20	21	21	16	17	17	14	15	15	15
Methylbutenes	80	77	77	76	82	81	81	84	83	83	83
Aromatics in C <sub>6</sub> +, % wt	0	0	0	0	0	0	0	0	0	0	0
90% OR, °F	440	421	410	408	424	412	412	418	408	405	396

(a) H<sub>2</sub> treat for one hour at 700°F, 200 psig following regeneration.

TABLE D33

PROCESSING 2H<sub>2</sub>/CO OVER CATALYST SG-B-3 AT 200 PSIG  
(Pretreatment: H<sub>2</sub>, 950°F, 0 psig, 16 Hr)

Run CT-158- Days On Stream Cumulative Days On Stream	136-1 1.0 1.0	136-2 2.0 2.0	136-3 4.0 4.0	137-1 0.8 4.8	137-2 1.8 5.8	137-3 2.8 6.8	138-1 0.8 7.6	138-2 1.8 8.6	138-3 3.8 10.6	
Temperature, Inlet, °F	478	482	482	473	479	480	473	479	481	
Average, °F	484	488	488	479	484	485	480	484	486	
Maximum, °F	500	500	500	497	500	500	497	499	500	
Outlet, °F	473	478	478	466	472	475	467	474	476	
GSV	529	530	526	509	507	517	503	500	500	
WHSV	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	R (a)
Contact Time, sec.	53.9	53.7	54.2	56.2	56.2	55.1	56.8	57.0	57.0	E
Material Balance, % wt	103	98	99	96	97	98	95	98	98	G
CO Conversion, % wt	77	77	74	84	81	79	82	79	75	N
To HC, % wt	98	99	99	99	99	99	99	99	99	E
H <sub>2</sub> Conversion, % wt	86	87	81	91	89	86	89	87	82	R
To HC, % wt	57	56	57	54	55	56	53	55	56	A
Total Conversion, % wt	78	78	75	85	82	80	83	80	76	T
gm HC/m <sup>3</sup> CO	452	424	429	453	449	451	440	434	434	I
gm C <sub>3</sub> <sup>+</sup> HC/gm Catalyst/hr	0.133	0.124	0.130	0.135	0.131	0.134	0.130	0.124	0.127	O
HC Selectivity, % wt	23	23	21	19	21	21	18	21	19	N
C <sub>1</sub>	3	3	3	3	3	3	3	3	3	
C <sub>2</sub>	5	5	5	5	5	6	4	5	5	
C <sub>3</sub>	7	6	10	6	6	8	5	6	9	
C <sub>4</sub>	10	10	12	10	10	10	10	10	11	
C <sub>5</sub>	51	52	50	57	55	52	60	55	53	
C <sub>6</sub> <sup>+</sup>										
Olefin Selectivity, % wt	6	10	8	6	6	7	7	7	10	
C <sub>2</sub>	12	15	18	9	12	12	14	10	12	
C <sub>3</sub>	47	49	51	43	46	47	41	42	46	
C <sub>4</sub>	62	62	63	57	58	59	56	56	57	
C <sub>5</sub> Olefin Selectivity, % wt	2	3	3	3	3	4	3	4	4	
1-Pentene	22	28	31	25	31	34	24	28	29	
2-Pentene	75	69	66	72	66	63	73	68	67	
Methylbutenes										
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	0	0	0	0	0	0	0	0	0	
90% OH, °F	457	437	435	452	454	456	462	453	445	

(a) Regeneration: Helium purge followed by 1% O<sub>2</sub> at 700°F, 100 psig for one hour then H<sub>2</sub> for one hour at 700°F, 200<sup>2</sup>psig.

TABLE D33 (Continued)

PROCESSING 2H<sub>2</sub>/CO OVER CATALYST SG-B-3 AT 200 PSIG

(Pretreatment: H<sub>2</sub>, 950°F, 0 psig, 16 Hr)

	139-1	139-2	139-3	139-4	140-1	140-2	140-3	141-1	141-2	141-3	
Run CT-158-											
Days On Stream	0.8	1.8	2.6	3.8	1.9	2.8	3.8	0.8	1.8	2.8	
Cumulative Days On Stream	11.4	12.4	13.4	14.4	16.3	17.2	18.2	19.0	20.0	21.0	
Temperature, Inlet, °F	475	480	482	484	476	482	484	475	482	484	
Average, °F	480	484	487	488	481	487	487	481	486	488	
Maximum, °F	497	500	500	501	495	499	500	497	500	501	
Outlet, °F	470	474	477	479	472	475	479	470	476	480	
GHSV	500	500	500	499	506	506	501	509	509	513	
WHSV	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	R (a)
Contact Time, sec.	57.1	57.0	57.0	57.1	56.6	56.4	56.8	56.2	56.0	55.5	E
Material Balance, % wt	96	98	98	97	92	96	100	100	99	97	G
CO Conversion, % wt	80	77	73	71	70	70	68	77	75	72	E
To HC, % wt	99	99	99	99	100	99	99	99	99	99	N
H <sub>2</sub> Conversion, % wt	87	84	81	78	76	78	77	82	79	75	E
To HC, % wt	55	56	55	54	53	56	53	55	56	56	R
Total Conversion, % wt	81	78	74	72	71	71	69	78	75	72	A
gm HC/m <sup>3</sup> CO	442	440	400	395	390	392	347	431	427	405	T
gm C <sub>3</sub> + HC/gm Catalyst/Hr	0.131	0.127	0.111	0.107	0.121	0.114	0.090	0.121	0.117	0.107	I
HC Selectivity, % wt	18	20	23	25	17	21	27	20	22	24	O
C <sub>1</sub>	3	3	3	3	2	3	4	3	3	3	N
C <sub>2</sub>	5	5	5	5	4	5	6	5	6	6	I
C <sub>3</sub>	7	8	6	6	6	6	8	8	8	8	O
C <sub>4</sub>	10	10	10	10	9	10	9	10	10	10	N
C <sub>5</sub>	58	53	53	51	61	56	47	55	51	49	N
C <sub>6</sub>											
Olefin Selectivity, % wt	11	7	8	8	13	14	10	9	9	9	
C <sub>2</sub>	6	8	21	8	21	9	6	0	1	2	
C <sub>3</sub>	40	42	43	41	42	40	41	31	33	33	
C <sub>4</sub>	55	55	56	57	55	56	57	46	48	49	
C <sub>5</sub>											
C <sub>5</sub> Olefin Selectivity, % wt	2	3	3	3	3	3	3	2	2	2	
1-Pentene	21	25	26	25	22	24	23	18	19	19	
2-Pentene	76	72	71	72	75	73	74	80	79	78	
Methylbutenes											
Aromatics in C <sub>6</sub> +, % wt	0	0	0	0	0	0	0	0	0	0	
90% OH, °F	457	449	445	436	444	420	443	440	420	410	

(a) Regeneration: Helium purge followed by 1% O<sub>2</sub> at 700°F, 100 psig for one hour then H<sub>2</sub> for one hour at 700°F, 200<sup>2</sup> psig.

TABLE D3J (Continued)

PROCESSING 2H<sub>2</sub>/CO OVER CATALYST SG-B-3 AT 200 PSIG  
(Pretreatment: H<sub>2</sub>, 950°F, 0 psig, 16 Hr)

Run CT-158.	142-1	142-2	142-3	143-1	143-2	143-3	143-4	144-1	144-2	144-3	144-3	144-3	145-1	145-2	145-3
Days On Stream	0.9	1.0	1.8	0.9	1.9	2.9	3.8	0.7	1.7	2.7	3.7	3.7	0.9	1.9	2.9
Cumulative Days On Stream	21.9	22.8	24.6	25.7	26.7	27.7	28.6	29.3	30.3	31.3	32.3	32.3	33.2	34.2	35.2
Temperature, Inlet, °F	475	482	482	476	484	485	487	478	484	486	487	486	479	486	487
Average, °F	480	487	486	482	488	489	491	485	489	490	491	486	486	491	491
Maximum, °F	496	501	499	497	500	500	501	498	500	501	501	498	496	500	500
Outlet, °F	472	478	479	473	480	481	484	474	480	482	484	476	481	483	483
GRSV	516	513	510	501	500	500	500	511	509	507	507	517	517	513	513
WHSV	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Contact Time, sec.	55.5	55.5	55.9	57.0	56.9	57.0	56.9	55.8	56.0	56.1	56.1	56.1	55.2	55.2	55.5
Material Balance, % wt	94	98	99	97	103	98	100	94	98	98	99	99	94	99	97
CO Conversion, % wt	73	72	72	72	70	62	61	70	67	64	59	59	60	58	53
To HC, % wt	100	99	100	100	100	99	99	100	100	100	99	100	100	100	100
H <sub>2</sub> Conversion, % wt	76	76	61	77	75	67	66	76	71	68	65	65	68	64	58
To HC, % wt	54	55	57	55	56	56	56	56	56	55	57	57	53	54	54
Total Conversion, % wt	74	73	59	73	71	63	62	71	67	64	60	60	61	58	53
gm HC/m <sup>3</sup> CO	399	396	347	402	396	343	337	388	377	344	331	331	326	317	299
gm C <sub>3</sub> + HC/gm Catalyst/Hr	0.118	0.107	0.091	0.113	0.107	0.086	0.082	0.107	0.099	0.088	0.082	0.082	0.097	0.089	0.080
HC Selectivity, % wt	18	23	25	18	21	26	28	22	25	27	29	29	22	25	28
C <sub>1</sub>	2	3	3	1	3	4	4	2	3	3	3	3	2	3	3
C <sub>2</sub>	5	5	6	5	6	6	6	6	6	5	6	6	6	6	6
C <sub>3</sub>	8	6	10	8	9	8	8	8	8	6	7	7	9	7	8
C <sub>4</sub>	10	10	11	11	10	9	10	10	11	10	9	9	11	10	10
C <sub>5</sub>	10	10	11	11	10	9	10	10	11	10	9	9	11	10	10
C <sub>6</sub> +	56	52	46	54	51	47	45	52	48	49	45	45	50	49	45
Olefin Selectivity, % wt	10	5	14	11	10	11	11	12	13	19	14	14	18	23	15
C <sub>1</sub>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
1-Pentene	17	17	17	15	15	15	15	14	13	15	14	14	13	13	14
2-Pentene	82	81	81	81	83	83	83	85	85	84	84	84	86	85	85
Methylbutene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aromatics in C <sub>6</sub> +, % wt	428	415	411	420	403	398	394	415	399	394	392	392	400	393	384
90% OH, %F															

(a) Regeneration: Helium purge followed by 1% O<sub>2</sub> at 700°F, 100 psig for one hour then H<sub>2</sub> for one hour at 700°F, 200 psig.

(b) Helium purge followed by 1% O<sub>2</sub> at 700°F, 100 psig for 1 hour, then 10% O<sub>2</sub> at 850°F for 4 hours. H<sub>2</sub> treat 1 hour at 700°F, 200 psig.

(c) Procedure same as in (b) with H<sub>2</sub> treat extended to 4 hours at 700°F, 200 psig.

TABLE D33 (Continued)

PROCESSING  $H_2/CO$  OVER SG-B-3 AT 500°F

(Pretreatment:  $H_2$ , 950°F, 0 psig, 16 Hr)

Run CT-159- Days On Stream Cumulative Days On-Stream	146-1 0.9 36.1	146-2 2.0 37.2	147-1 1.0 38.2	147-2 1.9 39.1	148-1 0.9 40.0	148-2 1.9 41.0	148-3 2.9 42.0	148-4 3.8 42.9	149-1 1.8 44.7	149-2 3.9 46.8
Temperature, Inlet, °F	482	485	480	487	484	486	490	490	486	493
Average, °F	485	489	486	492	487	491	493	493	488	494
Maximum, °F	497	500	497	501	497	500	501	500	498	501
Outlet, °F	474	481	476	482	478	483	485	486	480	488
Pressure, psig	200	200	200	200	200	200	200	200	200	200
GHSV	509	509	517	514	279	279	286	291	266	271
WHSV	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3
Contact Time, sec.	56.2	56.0	55.2	55.3	102.6	102.2	99.6	97.7	207.2	202.5
Material Balance, % wt	94	96	94	98	91	95	96	94	85	95
CO Conversion, % wt	59	56	59	58	75	70	67	62	65	46
To HC, % wt	100	100	100	100	99	99	99	99	100	100
$H_2$ Conversion, % wt	65	64	66	66	85	77	75	69	72	48
To HC, % wt	52	56	54	55	53	54	55	54	53	52
Total Conversion, % wt	60	57	60	59	77	71	68	63	66	47
gm HC, m CO	322	330	326	333	396	393	382	348	354	261
HC Selectivity, % wt	23	27	25	27	26	26	29	33	24	31
C <sub>1</sub>	2	3	2	3	3	3	3	4	4	5
C <sub>2</sub>	6	6	6	6	6	6	7	7	7	9
C <sub>3</sub>	7	7	8	8	5	6	7	7	7	9
C <sub>4</sub>	9	10	11	10	8	9	9	8	8	8
C <sub>5</sub>	52	47	48	46	52	49	44	41	50	38
C <sub>6</sub>										
Olefin Selectivity, % wt	17	23	17	14	12	13	9	14	10	14
C <sub>2</sub>	0	0	0	0	0	0	0	0	0	0
C <sub>3</sub>	22	13	16	26	9	7	8	7	5	2
C <sub>4</sub>	38	37	41	38	27	25	23	23	20	9
C <sub>5</sub>										
C <sub>6</sub>										
C <sub>5</sub> Olefin Selectivity, % wt	2	2	2	2	1	1	1	2	1	1
1-Pentene	13	13	14	14	11	13	12	12	22	13
2-Pentene	86	85	84	85	88	86	87	86	77	86
Methylbutenes										
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	0	0	0	0	0	0	0	0	0	1
90% OH, %	418	385	402	378	418	406	398	391	457	396

(A) Regeneration: Helium purge followed by 1% O<sub>2</sub> at 700°F, 100 psig for one hour then H<sub>2</sub> for one hour at 700°F, 200 psig.

(C) Helium purge followed by 1% O<sub>2</sub>, 100 psig for one hour then 10% O<sub>2</sub> at 850°F for 4 hours. Soaked in flowing 2% O<sub>2</sub> at 675°F for 42 hours at 100 psig. H<sub>2</sub> treat one hour at 700°F, 200 psig.

TABLE D34

PROCESSING H<sub>2</sub>/CO OVER FRESH SG-B-3 AT 500°F AND 200 PSIG  
(Activation: 16 Hrs, H<sub>2</sub>, 600°F, 200 psig)

Run Number CT-143-70- Days On Stream	1 0.9	2 1.9	3 3.9	4 4.9	5 5.9	6 6.9	7 7.9
Temperature, Inlet, °F	481	485	486	485	486	487	487
Average, °F	495	495	495	494	496	496	496
Maximum, °F	500	502	501	500	501	501	501
Outlet, °F	478	483	483	483	484	484	484
GHSV	521	514	514	514	514	514	514
WHSV	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Material Balance, % wt	102	104	93	105	105	104	104
CO Conversion, % wt	42	41	39	36	36	35	35
To HC, % wt	99	99	99	99	99	99	99
H <sub>2</sub> Conversion, % wt	86	85	81	78	77	77	76
To HC, % wt	54	55	56	58	57	57	57
Total Conversion, % wt	45	44	42	39	39	38	38
gm HC/m <sup>3</sup> CO	236	236	230	216	206	206	204
HC Selectivity, % wt							
C <sub>1</sub>	14	17	17	20	20	21	22
C <sub>1</sub>	2	2	3	3	3	3	3
C <sub>2</sub>	3	4	4	5	6	6	6
C <sub>3</sub>	6	6	9	8	7	7	7
C <sub>4</sub>	9	9	11	9	8	7	7
C <sub>5</sub> <sup>+</sup>	66	62	56	55	56	56	55
Olefin Selectivity, % wt							
C <sub>2</sub>	40	30	28	29	34	29	29
C <sub>3</sub>	59	58	62	66	70	69	69
C <sub>4</sub>	73	73	75	75	79	77	77
C <sub>5</sub>	82	83	83	83	83	84	84
C <sub>5</sub> Olefin Selectivity, % wt							
1-Pentene	2	3	4	5	4	4	4
2-Pentene	22	29	38	42	44	45	45
Methylbutenes	76	68	58	53	52	51	51
Aromatics in C <sub>6</sub> <sup>+</sup> , % wt	1	1	1	1	1	1	1
90% OH, °F	422	427	441	461	457	457	458

TABLE D35

PROCESSING H<sub>2</sub>/CO AT 500°F AND 200 PSIG OVER USED SG-B-3 AFTER n-DECANE EXTRACTION

Run Number CT-143-70-Days On Stream	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Temperature, Inlet, °F	484	486	489	489	489	488	489	482	487	487	488	487	489	485	487
Average, °F	495	493	498	498	498	497	497	492	495	495	496	494	497	494	495
Maximum, °F	502	501	501	504	503	501	501	499	502	501	502	501	502	501	502
Outlet, °F	483	484	488	488	488	487	487	482	486	486	488	486	488	484	486
GHSV	510	520	521	518	518	511	511	550	521	521	527	514	516	516	516
MHSV	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Material Balance, % wt	101	102	101	97	104	102	103	96	103	102	100	100	101	100	99
CO Conversion, % wt	40	37	35	37	32	31	31	34	32	29	28	30	25	33	29
To HC, % wt	99	99	99	99	99	99	99	n-C10	99	99	99	99	99	99	99
H <sub>2</sub> Conversion, % wt	81	76	73	73	69	66	64	63	64	61	59	58	54	63	59
To HC, % wt	54	56	55	55	58	57	55	49	54	55	53	50	57	51	54
Total Conversion, % wt	43	40	38	39	35	33	33	36	34	31	30	32	27	35	31
gm HC/m <sup>3</sup> CO	224	214	202	218	182	176	174	177	177	162	147	161	145	179	163
HC Selectivity, % wt	15	16	17	17	21	21	22	15	17	20	21	18	20	16	18
C1	1	2	2	2	2	2	3	2	2	2	2	1	1	2	2
C2	4	4	4	3	4	5	5	2	4	4	5	4	5	5	4
C3	7	7	7	12	7	7	7	8	7	8	7	7	9	9	6
C4	9	9	10	13	9	8	8	12	10	9	9	8	8	9	9
C5+	64	62	60	53	57	57	55	61	60	57	56	62	57	59	61
C6															
Olefin Selectivity, % wt	24	39	26	39	25	24	39	33	25	25	33	-	50	33	68
C2	50	50	55	42	55	59	59	-	57	50	57	42	43	44	34
C3	70	72	74	70	74	74	74	64	67	66	67	56	65	61	55
C4	81	82	82	82	83	83	83	78	79	80	80	74	78	75	77
C5															
C <sub>5</sub> Olefin Selectivity, % wt	2	2	3	3	3	3	3	2	2	2	3	2	2	2	2
1-Pentene	21	23	25	26	28	30	31	16	20	20	21	18	19	16	18
2-Pentene	77	75	72	71	69	67	66	79	78	78	76	80	79	80	80
Methylbutenes															
Aromatics in C <sub>6</sub> , % wt	1	1	1	1	1	1	1	1	1	1	1	8	1	1	1
90% OH, °F	381	381	381	377	382	380	373	384	463	410	403	375	379	385	391

TABLE D36

## MATERIAL BALANCES FROM FLUID BENCH-SCALE UNIT WITH CATALYST SGF-B-1

	17- 1	17- 2	17- 3	17- 4	17- 5	17- 6	17- 7	17- 8
RUN NUMBER 225-								
RUN DAYS-ON-STREAM	1.5	2.6	3.6	6.6	8.5	9.5	11.5	12.5
CUM. DAYS-ON-STREAM	1.5	2.6	3.6	6.6	8.5	9.5	11.5	12.5
FRESH FEED H <sub>2</sub> /CO RATIO	1.9	2.0	2.0	1.9	1.9	2.1	2.1	2.2
GHSV, HR <sup>-1</sup> (CHG BASIS)	503	500	491	724	724	716	489	489
RECYCLE RATIO	1.88	1.93	1.97	2.69	2.36	2.19	1.95	1.94
REACT. PRESS., PSIG	200	200	200	200	200	199	199	201
REACT. INLET TEMP., °F	400	400	397	397	422	426	437	442
NOM. REACT. TEMP., °F	500	500	500	500	500	500	500	500
CONVERSIONS, MOL %								
H <sub>2</sub>	95.1	96.2	95.2	68.2	68.9	57.4	77.4	78.2
CO	86.9	87.0	88.5	58.7	59.2	53.9	65.5	66.2
H <sub>2</sub> +CO	92.3	93.1	92.9	65.0	65.6	56.3	73.6	74.4
YIELDS, WT %								
HYDROGEN	0.6	0.5	0.6	3.9	3.8	5.7	3.0	2.9
WATER	48.4	47.0	47.8	34.1	32.5	31.9	36.9	36.8
CO	11.5	11.4	10.1	36.4	35.9	40.0	30.0	29.3
CO <sub>2</sub>	2.6	2.9	2.8	1.2	1.2	0.6	0.9	1.1
TOTAL HYDROCARBON	37.0	38.2	38.6	24.3	26.5	21.7	29.1	29.8
HC SELECTIVITY, WT %								
METHANE	24.4	26.6	29.5	35.6	44.4	39.1	39.9	41.4
ETHENE	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
ETHANE	3.5	3.8	4.0	4.8	5.9	5.1	5.4	5.7
PROPENE	0.2	0.1	0.1	0.8	0.6	0.8	0.6	0.6
PROPANE	2.2	2.2	2.5	3.0	3.5	3.8	3.7	3.8
BUTENES	1.1	1.1	1.2	2.5	2.2	2.9	2.1	2.0
I-BUTANE	2.3	1.9	1.6	0.7	0.7	0.5	0.7	0.8
N-BUTANE	2.2	2.1	2.2	2.3	2.4	2.6	2.8	2.8
TOTAL C <sub>4</sub> -	35.9	37.8	41.1	49.7	59.8	55.0	55.3	57.0
C <sub>5</sub> + PARAFFINS	21.6	18.3	16.3	14.5	10.7	10.8	12.7	12.4
OLEFINS	25.7	27.5	28.7	22.4	15.5	16.9	16.9	19.2
NAPHTHENES	2.2	1.6	1.1	0.6	0.6	0.6	0.8	0.6
AROMATICS	0.8	0.6	0.5	0.5	0.3	0.3	0.3	0.3
OTHERS	13.8	14.2	12.3	12.4	13.0	16.3	14.1	10.5
TOTAL C <sub>5</sub> +	64.1	62.2	58.9	50.3	40.2	45.0	44.7	43.0
YIELDS, G/SCM CONV CO+H <sub>2</sub>								
TOTAL HC	198	195	198	181	197	176	182	183
C <sub>5</sub> +	127	121	117	91	79	79	81	78
OLEFINS, WT % BY C NO.								
C <sub>2</sub>	0.9	0.9	0.8	1.9	1.5	2.2	1.6	1.5
C <sub>3</sub>	6.7	6.0	5.7	20.5	15.4	18.0	13.5	12.9
C <sub>4</sub>	20.4	22.1	23.7	46.1	40.7	48.3	37.9	35.7
C <sub>5</sub>	37.7	42.2	45.6	57.5	54.1	58.5	52.3	50.5
90 PCT OH, RAW PROD., °F	380	384	382	375	399	395	405	405
OCTANE NO. ON RAW PROD.								
R+0	84.8	84.3	84.3	82.5	82.2	82.3	80.3	80.6
R+3	94.3	94.1	95.2	92.7	92.0	92.4	91.4	91.1
OXYGENATES, WT %	-	-	0.1	0.2	0.2	0.2	0.3	0.1



TABLE D37

## MATERIAL BALANCES FROM FLUID BENCH-SCALE UNIT WITH CATALYST SGF-B-1

	19- 1	19- 2	19- 3	19- 4	19- 5	19- 6	19- 7
RUN NUMBER 225-							
RUN DAYS-ON-STREAM	1.8	2.6	4.4	5.5	6.4	8.4	9.4
CUM. DAYS-ON-STREAM	1.8	2.6	4.4	5.5	6.4	8.4	9.4
FRESH FEED H <sub>2</sub> /CO RATIO	2.0	2.0	2.1	2.0	2.1	2.0	2.0
GHSV, HR <sup>-1</sup> (CHG BASIS)	463	463	463	463	463	463	463
RECYCLE RATIO	1.07	1.09	1.35	1.43	1.44	1.07	1.04
REACT. PRESS., PSIG	201	201	200	200	200	200	200
REACT. INLET TEMP., °F	424	422	419	423	418	425	424
NOM. REACT. TEMP., °F	500	500	475	475	475	500	500
CONVERSIONS, MOL %							
H <sub>2</sub>	97.1	96.6	86.5	85.3	85.4	93.0	92.8
CO	87.6	86.6	73.9	74.1	70.6	79.0	79.5
H <sub>2</sub> +CO	93.9	93.3	82.5	81.6	80.6	88.2	88.3
YIELDS, WT %							
HYDROGEN	0.4	0.4	1.8	1.9	1.9	0.9	0.9
WATER	46.6	47.1	41.1	41.6	38.9	43.1	43.5
CO	10.9	11.7	22.7	22.7	25.6	18.5	18.0
CO <sub>2</sub>	3.8	3.2	1.0	1.0	1.1	2.7	2.6
TOTAL HYDROCARBON	38.3	37.6	33.3	32.6	32.2	34.5	34.9
HC SELECTIVITY, WT %							
METHANE	25.5	24.5	26.8	26.4	27.7	28.7	30.5
ETHENE	0.0	0.0	0.1	0.1	0.1	0.1	0.1
ETHANE	3.6	3.5	4.2	4.1	4.5	4.5	4.6
PROPENE	0.2	0.3	1.2	1.3	1.8	0.7	0.6
PROPANE	2.3	2.0	4.6	5.0	5.4	3.4	3.6
BUTENES	1.2	1.5	3.1	3.3	3.9	2.6	2.6
I-BUTANE	2.3	1.8	0.4	0.3	0.2	0.6	0.5
N-BUTANE	2.2	2.2	3.4	3.6	3.5	2.6	2.6
TOTAL C <sub>4</sub> -	37.4	35.8	43.8	44.1	47.0	43.1	45.1
C <sub>5</sub> + PARAFFINS	22.1	20.0	15.9	14.6	13.2	14.4	12.8
OLEFINS	26.6	27.4	25.4	27.1	26.9	29.8	28.8
NAPHTHENES	1.7	1.1	0.9	0.5	0.1	0.9	0.9
AROMATICS	0.5	0.3	0.1	0.1	0.0	0.4	0.1
OTHERS	11.8	15.4	13.8	13.7	12.7	11.5	12.4
TOTAL C <sub>5</sub> +	62.6	64.2	56.2	55.9	53.0	56.9	54.9
YIELDS, G/SCM CONV CO+H <sub>2</sub>							
TOTAL HC	195	191	188	188	185	188	190
C <sub>5</sub> +	122	123	105	105	98	107	104
OLEFINS, WT % BY C NO.							
C <sub>2</sub>	1.2	1.3	1.7	2.0	1.8	1.5	1.3
C <sub>3</sub>	6.4	12.8	20.9	20.5	24.8	17.7	14.9
C <sub>4</sub>	21.6	26.8	44.9	45.7	50.8	45.4	45.5
C <sub>5</sub>	39.8	47.2	56.6	57.2	59.2	62.3	62.3
90 PCT OH, RAW PROD., °F	381	381	425	440	465	402	401
OCTANE NO. OH RAW PROD.							
R+0	81.7	82.3	77.9	74.9	65.0	80.9	81.3
R+3	-	-	88.9	87.7	-	93.3	93.2
OXYGENATES, WT %	0.4	0.4	0.5	0.2	0.2	0.3	0.3

TABLE D38

## MATERIAL BALANCES FROM FLUID BENCH-SCALE UNIT WITH CATALYST SGF-B-1

	19- 8	19- 9	19-10	19-11	19-12	19-13	19-14
RUN NUMBER 225-							
RUN DAYS-ON-STREAM	11.4	12.4	13.4	14.4	15.4	16.4	17.4
CUM. DAYS-ON-STREAM	11.4	12.4	13.4	14.4	15.4	16.4	17.4
FRESH FEED H <sub>2</sub> /CO RATIO	2.0	2.0	2.0	2.0	2.0	1.9	2.0
GHSV, HR <sup>-1</sup> (CHG BASIS)	455	453	449	453	461	463	459
RECYCLE RATIO	1.06	1.10	1.09	1.14	1.11	1.05	1.08
REACT. PRESS., PSIG	202	202	202	200	200	200	202
REACT. INLET TEMP., °F	432	429	430	421	427	421	420
NOM. REACT. TEMP., °F	525	525	525	525	525	525	525
CONVERSIONS, MOL %							
H <sub>2</sub>	96.4	95.7	94.4	93.4	91.9	90.5	92.1
CO	84.1	82.9	80.8	78.8	75.5	75.5	76.2
H <sub>2</sub> +CO	92.3	91.4	89.8	88.5	86.4	85.4	86.7
YIELDS, WT %							
HYDROGEN	0.5	0.5	0.7	0.8	1.0	1.2	1.0
WATER	43.2	42.7	41.9	41.2	40.6	40.1	40.1
CO	14.0	15.0	16.9	18.6	21.5	21.6	20.9
CO <sub>2</sub>	6.7	5.8	5.2	4.5	3.8	3.9	4.9
TOTAL HYDROCARBON	35.7	36.0	35.3	34.8	33.0	33.3	33.1
HC SELECTIVITY, WT %							
METHANE	39.8	40.7	41.9	42.6	42.3	45.4	49.6
ETHENE	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ETHANE	5.2	5.2	5.0	5.0	5.0	5.2	5.5
PROPENE	0.3	0.3	0.4	0.4	0.7	0.4	0.5
PROPANE	2.7	2.5	2.5	2.4	2.2	2.5	2.7
BUTENES	1.7	1.7	1.8	2.0	2.1	2.0	1.9
I-BUTANE	1.2	1.4	1.3	1.1	1.0	0.8	0.9
N-BUTANE	2.1	2.1	2.0	1.9	1.9	1.8	1.9
TOTAL C <sub>4</sub> -	53.2	54.0	55.0	55.6	55.2	58.3	63.1
C <sub>5</sub> + PARAFFINS	12.4	12.9	12.0	11.7	11.9	10.2	10.0
OLEFINS	22.3	20.3	21.2	20.0	20.8	19.4	16.9
NAPHTHENES	1.0	1.0	1.0	0.9	0.9	1.1	0.7
AROMATICS	0.5	0.6	0.6	0.5	0.5	0.4	0.2
OTHERS	10.6	11.1	10.2	11.4	10.7	10.6	9.0
TOTAL C <sub>5</sub> +	46.8	46.0	45.0	44.4	44.8	41.7	36.9
YIELDS, G/SCM CONV CO+H <sub>2</sub>							
TOTAL HC	183	189	188	187	182	190	183
C <sub>5</sub> +	86	87	85	83	82	79	68
OLEFINS, WT % BY C NO.							
C <sub>2</sub>	1.2	1.7	1.9	1.7	2.0	1.6	1.5
C <sub>3</sub>	10.6	11.7	12.5	13.8	23.2	14.6	14.6
C <sub>4</sub>	33.3	32.5	35.2	39.5	42.9	42.8	40.3
C <sub>5</sub>	51.2	49.2	51.1	54.7	57.6	57.8	55.1
90 PCT OH, RAW PROD., °F	378	373	377	378	381	381	375
OCTANE NO. ON RAW PROD.							
R+0	85.3	85.5	85.5	85.1	86.2	85.3	84.6
R+3	96.2	95.6	95.8	96.1	95.8	96.0	95.5
OXYGENATES, WT %	-	-	-	-	-	-	-

TABLE D39

MATERIAL BALANCES FROM FLUID BENCH-SCALE UNIT WITH CATALYST SGF-B-1

	20- 1	20- 5	20- 6	20- 7	20- 8	21- 1	21- 2	21- 3	21- 4	21- 5	22- 1	22- 2
RUN NUMBER 225-	1.3	5.3	6.3	7.2	8.3	1.4	2.4	3.4	4.4	6.3	1.5	2.5
RUN DAYS-ON-STREAM	1.3	5.3	6.3	7.2	8.3	10.3	11.3	12.3	13.3	15.2	17.2	18.2
CUM. DAYS-ON-STREAM	2.1	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.1	2.0	1.9
FRESH FEED H <sub>2</sub> /CO RATIO	493	499	501	499	504	494	488	486	488	477	501	504
GHSV, HR <sup>-1</sup> (CHG BASIS)	4.20	4.06	4.02	4.02	4.04	4.03	4.17	4.23	4.27	4.23	4.06	4.11
RECYCLE RATIO	200	202	200	202	201	201	200	200	200	201	201	202
REACT. PRESS., PSIG	416	425	426	424	420	415	431	435	427	434	418	419
REACT. INLET TEMP., °F	500	500	500	500	500	500	500	500	500	500	500	500
NOM. REACT. TEMP., °F												
CONVERSIONS, MOL %/°												
H <sub>2</sub>	97.5	93.3	92.7	92.5	91.6	89.2	88.6	86.3	77.0	87.2	72.1	67.2
CO	86.7	79.0	77.6	77.5	75.8	75.0	73.5	72.8	63.6	71.3	57.0	53.8
H <sub>2</sub> +CO	94.0	88.5	87.6	87.5	86.3	84.5	83.6	81.8	72.5	82.0	67.1	62.6
YIELDS, WT %/°												
HYDROGEN	0.3	0.8	0.9	0.9	1.0	1.4	1.5	1.7	2.9	1.6	3.5	4.0
WATER	47.7	44.5	44.2	43.2	42.6	43.0	42.2	41.6	37.0	40.1	31.9	29.7
CO	11.5	18.5	19.7	19.7	21.3	21.9	23.2	23.8	31.9	25.0	38.0	41.0
C <sub>2</sub>	2.0	1.5	1.4	1.4	1.3	0.7	0.8	0.8	0.6	1.1	0.5	0.5
38.4	34.8	33.8	34.8	34.8	33.8	33.1	32.3	32.1	27.6	32.1	26.0	24.7
TOTAL HYDROCARBON												
HC SELECTIVITY, WT %/°												
METHANE	19.9	28.3	29.2	30.4	31.6	22.3	23.9	28.1	29.8	33.3	30.6	32.8
ETHANE	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ETHANE	2.6	3.8	4.0	4.1	4.3	3.3	3.5	4.1	4.3	5.0	5.1	5.4
PROPENE	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.6	0.2	0.9	0.3
PROPANE	1.9	2.4	2.5	2.7	2.9	3.3	3.2	3.8	3.8	4.4	9.7	10.6
BUTENES	0.9	1.2	1.3	1.4	1.4	0.9	0.9	0.9	1.2	1.0	0.4	0.4
I-BUTANE	3.3	1.6	1.5	1.5	1.4	3.5	3.1	2.8	2.4	3.1	3.8	3.8
N-BUTANE	2.0	2.1	2.1	2.3	2.4	3.4	3.3	3.6	3.8	3.8	9.2	9.3
TOTAL C <sub>4</sub> -	30.7	39.7	41.0	42.7	44.4	36.9	38.2	43.6	46.0	50.9	59.8	62.6
C <sub>5</sub> + PARAFFINS	24.9	16.4	16.0	16.9	15.6	28.2	25.1	24.9	21.5	20.8	24.5	22.8
OLEFINS	25.7	26.9	27.6	24.4	23.7	15.6	18.2	14.1	14.3	11.5	2.9	2.3
NAPHTHENES	2.6	1.1	0.8	1.3	1.2	3.4	2.9	2.8	2.9	3.0	3.7	4.4
AROMATICS	0.6	0.3	0.5	0.3	0.3	0.4	0.4	0.4	0.4	3.3	0.5	0.5
OTHERS	15.6	15.6	14.1	14.4	14.7	15.4	15.2	14.1	15.1	10.5	8.5	7.3
TOTAL C <sub>5</sub> +	69.3	60.3	59.0	57.3	55.6	63.1	61.8	56.4	54.0	49.1	40.2	37.4
YIELDS, G/SCM CONV CO+H <sub>2</sub>												
TOTAL HC	189	189	185	190	189	185	183	187	183	184	183	189
C <sub>5</sub> +	131	114	109	109	105	117	113	105	99	91	74	71
OLEFINS, WT %/° BY C NO.												
C <sub>2</sub>	1.4	1.2	1.3	1.3	1.3	1.0	1.1	0.9	1.0	1.0	0.4	0.5
C <sub>3</sub>	6.0	9.2	9.4	8.5	7.6	5.0	5.3	4.7	12.8	4.2	8.8	2.9
C <sub>4</sub>	14.2	25.0	26.7	27.4	27.4	11.1	12.9	12.6	15.5	12.6	2.9	3.1
C <sub>5</sub>	30.5	44.1	44.8	44.9	45.5	20.5	22.8	22.3	24.9	21.5	4.2	4.4
381	414	401	407	407	458	375	372	373	375	366	357	-
90 PCT OH, RAW PROD., °F												
OCTANE NO. ON RAW PROD.												
R+0	83.2	83.9	83.1	83.8	83.4	78.8	79.2	79.2	77.6	80.6	-	-
R+3	94.0	93.9	-	-	-	92.4	91.7	93.5	92.5	94.6	-	-
OXYGENATES, WT %/°	0.3	0.4	0.3	0.4	0.2	0.3	0.2	0.2	0.3	0.1	0.2	-

TABLE D40

## MATERIAL BALANCES FROM FLUID BENCH-SCALE UNIT WITH CATALYST SGF-B-1

	23- 1	23- 2	23- 3	24- 1	24- 2	24- 3	24- 4	24- 5
RUN NUMBER 225-								
RUN DAYS-ON-STREAM	1.3	2.3	4.2	1.3	2.4	3.5	4.5	5.4
CUM. DAYS-ON-STREAM	1.3	2.3	4.2	1.3	2.4	3.5	4.5	5.4
FRESH FEED H <sub>2</sub> /CO RATIO	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.0
GHSV, HR <sup>-1</sup> (CHG BASIS)	509	509	511	491	497	504	505	502
RECYCLE RATIO	3.95	4.01	3.99	3.94	3.93	3.87	3.87	3.88
REACT. PRESS., PSIG	200	201	200	202	200	201	201	201
REACT. INLET TEMP., °F	413	416	419	423	418	426	430	426
NOM. REACT. TEMP., °F	500	500	500	500	500	500	500	500
CONVERSIONS, MOL %								
H <sub>2</sub>	92.9	92.4	84.6	96.7	93.1	94.3	93.8	93.2
CO	80.9	80.5	71.4	82.9	79.7	81.7	81.3	79.3
H <sub>2</sub> +CO	88.9	88.5	80.3	92.2	88.7	90.2	89.7	88.6
YIELDS, WT %								
HYDROGEN	0.9	1.0	2.0	0.4	0.9	0.7	0.8	0.9
WATER	45.5	44.9	40.4	47.3	43.5	45.8	45.4	45.0
CO	16.7	17.0	24.9	15.1	17.8	16.0	16.3	18.1
CO <sub>2</sub>	1.8	1.6	1.3	2.6	1.7	1.5	1.5	1.5
TOTAL HYDROCARBON	35.1	35.5	31.4	34.5	36.1	36.0	35.9	34.5
HC SELECTIVITY, WT %								
METHANE	24.9	24.7	32.8	28.5	26.2	24.1	25.3	24.7
ETHENE	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1
ETHANE	3.8	3.8	5.0	3.7	3.6	3.2	3.4	3.3
PROPENE	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2
PROPANE	2.5	2.4	2.7	2.2	1.9	1.6	1.7	1.6
BUTENES	1.0	1.1	1.2	1.1	1.1	1.1	1.2	1.4
I-BUTANE	3.6	3.0	2.7	3.8	2.2	1.8	1.6	1.3
N-BUTANE	2.5	2.4	2.6	2.1	1.8	1.7	1.6	1.6
TOTAL C <sub>4</sub> -	38.5	37.5	47.3	41.7	37.0	33.8	35.0	34.4
C <sub>5</sub> + PARAFFINS	24.7	22.1	20.2	19.7	18.5	17.8	16.8	16.1
OLEFINS	19.2	20.6	15.0	22.8	26.1	28.7	29.3	30.9
NAPHTHENES	2.6	2.5	2.2	1.4	1.2	1.2	1.3	1.2
AROMATICS	0.7	0.4	0.7	0.4	0.5	0.3	0.3	0.3
OTHERS	14.3	16.9	14.7	14.0	16.7	18.1	17.3	17.0
TOTAL C <sub>5</sub> +	61.5	62.5	52.7	58.3	63.0	66.2	65.0	65.6
YIELDS, G/SCM CONV CO+H <sub>2</sub>								
TOTAL HC	188	187	180	172	192	187	188	185
C <sub>5</sub> +	116	117	95	100	121	124	122	121
OLEFINS, WT % BY C NO.								
C <sub>2</sub>	1.2	1.2	1.7	1.3	1.5	1.6	1.5	1.8
C <sub>3</sub>	7.3	6.2	8.6	7.2	9.3	10.9	9.5	12.9
C <sub>4</sub>	14.0	16.7	18.0	15.4	21.0	24.1	26.7	32.2
C <sub>5</sub>	26.9	30.4	28.7	32.1	38.8	43.4	47.5	52.6
90 PCT OH, RAW PROD., °F	374	-	371	372	380	379	382	380
OCTANE NO. ON RAW PROD.								
R+0	82.0	82.0	82.1	83.1	82.9	83.5	83.7	83.7
R+3	95.7	95.9	95.0	96.1	96.1	93.8	-	-
OXYGENATES, WT %	0.2	0.1	0.4	0.2	0.1	-	-	-

TABLE D41

MATERIAL BALANCES FROM FLUID BENCH-SCALE UNIT WITH CATALYST SGF-B-1

	25- 1	25- 2	25- 3	25- 4	25- 5	25- 6	25- 7	25- 8	25- 9
RUN NUMBER 225-	1.5	2.6	3.6	4.8	5.7	6.7	7.5	8.6	9.6
RUN DAYS-ON-STREAM	7.4	8.5	9.5	10.7	11.6	12.6	13.5	14.5	15.5
CUM. DAYS-ON-STREAM	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
FRESH FEED H <sub>2</sub> /CO RATIO	497	497	497	497	500	500	500	498	500
CHSV. HR <sup>-1</sup> (CHG BASIS)	3.91	3.89	3.89	3.99	4.00	4.05	4.00	4.02	4.01
RECYCLE RATIO	201	202	201	200	200	200	200	200	200
REACT. PRESS., PSIG	424	418	422	421	422	421	425	430	428
REACT. INLET TEMP., °P	500	500	500	500	500	500	500	500	500
NON. REACT. TEMP., °P									
CONVERSIONS, MOL %									
H <sub>2</sub>	95.8	95.1	95.0	93.9	93.4	93.2	93.3	93.4	92.7
CO	81.4	81.5	79.4	78.5	78.8	77.7	78.3	77.0	75.5
H <sub>2</sub> +CO	91.0	90.6	89.8	88.8	88.5	88.0	88.2	87.8	86.9
YIELDS, WT %									
HYDROGEN	0.5	0.6	0.6	0.8	0.8	0.9	0.8	0.8	0.9
WATER	45.2	44.8	45.0	44.7	45.4	43.7	45.2	43.2	42.5
CO	16.3	16.2	16.0	18.8	18.6	19.6	19.1	20.3	21.5
CO <sub>2</sub>	1.7	1.6	1.5	1.4	0.6	1.5	1.4	1.4	1.4
TOTAL HYDROCARBON	36.2	36.7	34.8	34.3	34.6	34.4	33.5	34.2	33.6
HC SELECTIVITY, WT %									
METHANE	19.6	21.5	22.3	24.0	24.4	25.1	26.4	26.0	26.5
ETHANE	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1
ETHANE	2.3	2.5	2.6	2.7	2.8	2.9	3.1	3.1	3.1
PROPENE	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3
PROPANE	1.9	1.8	1.6	1.6	1.6	1.7	1.8	1.5	1.6
BUTENES	1.1	1.1	1.2	1.3	1.3	1.5	1.6	1.6	1.7
I-BUTANE	3.5	2.8	2.3	2.0	1.6	1.7	1.5	1.4	1.1
N-BUTANE	2.1	1.9	1.8	1.7	1.6	1.7	1.7	1.6	1.5
TOTAL C <sub>4</sub> -	30.6	31.9	32.0	33.6	33.6	34.9	36.4	35.6	35.9
CS+ PARAFFINS	26.8	21.1	20.5	18.2	16.2	15.7	14.3	13.1	12.5
OLEFINS	23.0	27.9	29.1	29.8	32.3	32.2	32.7	34.8	35.0
NAPHTHENES	2.7	1.5	1.5	1.1	0.7	0.8	0.6	0.7	1.1
AROMATICS	1.2	0.7	0.8	0.6	0.4	0.3	0.3	0.3	0.3
OTHERS	15.6	16.9	16.1	16.7	16.8	16.0	15.7	15.5	15.2
TOTAL CS+	69.4	68.1	68.0	66.4	66.4	65.1	63.6	64.4	64.1
YIELDS, G/SCM CONV CO+H <sub>2</sub>									
TOTAL HC	188	191	183	182	187	187	182	187	185
CS+	130	130	124	121	124	122	115	120	119
OLEFINS, WT % BY C NO.									
C <sub>2</sub>	1.8	1.8	1.9	1.8	1.9	2.0	2.0	2.1	2.0
C <sub>3</sub>	7.7	8.7	10.9	12.0	13.2	14.3	14.0	21.6	17.0
C <sub>4</sub>	15.9	19.0	23.1	26.1	28.7	31.0	33.1	34.4	39.1
C <sub>5</sub>	30.9	37.2	41.6	46.2	49.4	51.9	54.4	56.3	59.9
90 PCT OH, RAW PROD., °P	370	366	366	357	374	374	350	355	377
OCTANE NO. ON RAW PROD.									
R+0	84.1	84.1	84.7	84.6	85.6	85.3	85.3	85.4	85.0
R+3	94.9	94.9	94.0	94.0	-	-	-	-	-
OXYGENATES, WT %	0.2	-	-	-	0.4	-	-	-	0.4

TABLE D42

## MATERIAL BALANCES FROM FLUID BENCH-SCALE UNIT WITH CATALYST SGF-B-1

	26- 1	26- 2	26- 3	26- 4	26- 5	27- 1	27- 2
RUN NUMBER 225-							
RUN DAYS-ON-STREAM	1.5	2.6	3.6	5.6	6.7	1.1	2.4
CUM. DAYS-ON-STREAM	17.5	18.6	19.6	21.6	22.7	24.3	25.6
FRESH FEED H <sub>2</sub> /CO RATIO	2.0	2.0	2.0	2.0	2.0	2.0	2.0
GHSV, HR <sup>-1</sup> (CHG BASIS)	503	504	505	502	500	508	504
RECYCLE RATIO	3.98	3.98	3.99	4.01	4.12	3.93	4.00
REACT. PRESS., PSIG	201	201	202	200	200	200	200
REACT. INLET TEMP., °F	428	426	419	422	420	422	421
NOM. REACT. TEMP., °F	500	500	500	500	500	500	500
CONVERSIONS, MOL %							
H <sub>2</sub>	94.6	93.0	91.1	90.2	86.0	92.8	77.4
CO	82.0	79.5	75.3	76.8	71.6	78.4	63.3
H <sub>2</sub> +CO	90.4	88.6	85.8	85.7	81.2	88.0	72.8
YIELDS, WT %							
HYDROGEN	0.7	0.9	1.1	1.3	1.8	0.9	2.9
WATER	44.2	42.3	40.7	43.4	41.6	41.4	36.3
CO	15.7	17.9	21.7	20.4	24.8	19.0	32.2
CO <sub>2</sub>	3.9	3.5	3.2	1.1	1.0	2.5	1.1
TOTAL HYDROCARBON	35.5	35.4	33.2	33.8	30.8	36.2	27.6
HC SELECTIVITY, WT %							
METHANE	34.5	38.3	39.9	27.2	32.5	30.9	38.0
ETHENE	0.1	0.1	0.1	0.0	0.0	0.1	0.1
ETHANE	3.8	4.1	4.2	3.3	3.9	3.9	4.9
PROPENE	0.2	0.2	0.3	0.1	0.3	0.2	0.2
PROPANE	2.8	2.9	2.8	2.9	2.9	3.8	3.5
BUTENES	0.8	0.9	1.0	0.8	1.0	0.9	1.0
I-BUTANE	3.9	3.7	3.3	3.6	2.9	4.2	3.0
N-BUTANE	2.6	2.6	2.5	2.8	2.9	3.4	3.4
TOTAL C <sub>4</sub> -	48.5	52.7	53.9	40.7	46.5	47.3	54.0
C <sub>5</sub> + PARAFFINS	22.3	19.7	19.3	27.8	23.1	26.7	20.3
OLEFINS	12.8	11.8	11.5	12.9	13.6	11.3	9.7
NAPHTHENES	3.0	2.4	2.4	3.5	2.5	4.4	3.4
AROMATICS	4.7	4.5	4.7	0.6	0.4	3.2	3.6
OTHERS	8.8	9.0	8.1	14.4	13.9	7.0	9.0
TOTAL C <sub>5</sub> +	51.5	47.3	46.1	59.3	53.5	52.7	46.0
YIELDS, G/SCM CONV CO+H <sub>2</sub>							
TOTAL HC	187	188	184	186	179	195	178
C <sub>5</sub> +	96	89	85	110	96	103	82
OLEFINS, WT % BY C NO.							
C <sub>2</sub>	1.8	1.9	2.1	1.3	1.2	1.3	1.6
C <sub>3</sub>	5.7	7.6	9.2	3.7	8.8	4.9	5.6
C <sub>4</sub>	10.8	12.1	14.4	10.8	14.2	10.1	13.3
C <sub>5</sub>	17.0	18.5	21.6	20.1	23.1	16.2	18.4
90 PCT OH, RAW PROD., °F	339	339	345	349	366	363	339
OCTANE NO. ON RAW PROD.							
R+0	83.6	83.6	84.2	80.1	82.1	80.7	80.9
R+3	-	-	-	94.2	94.9	-	91.7
OXYGENATES, WT %	0.1	-	-	-	0.3	-	-

TABLE D43

## MATERIAL BALANCES FROM FLUID BENCH-SCALE UNIT WITH CATALYST SCF-B-1

	28-1	28-2	28-3	28-4	28-5	29-1	29-2	30-1	30-2	31-1	31-2	31-3
RUN NUMBER 225-												
RUN DAYS-ON-STREAM	1.7	2.8	3.8	4.9	5.8	1.3	2.4	1.6	2.7	1.5	2.5	3.5
CUM. DAYS-ON-STREAM	1.7	2.8	3.8	4.9	5.8	7.6	8.7	10.8	11.9	13.9	14.7	15.7
FRESH FEED H <sub>2</sub> /CO RATIO	2.0	1.9	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
GHSV, HR <sup>-1</sup> (CHG BASIS)	501	746	741	493	496	494	494	504	512	502	502	500
RECYCLE RATIO	4.04	2.34	2.37	4.07	4.10	4.07	4.09	4.02	4.01	4.00	4.02	4.01
REACT. PRESS., PSIG	200	200	200	200	200	200	200	201	200	200	200	200
REACT. INLET TEMP., °F	416	428	424	425	423	435	433	434	420	421	430	437
NOM. REACT. TEMP., °F	500	500	500	500	500	500	500	500	500	500	500	500
CONVERSIONS, MOL %/°												
H <sub>2</sub>	96.9	92.8	91.4	94.9	93.9	92.4	90.6	89.7	86.6	79.1	79.1	77.7
CO	84.0	77.9	76.4	80.8	79.4	78.4	73.8	74.1	71.9	64.0	63.0	61.9
H <sub>2</sub> +CO	92.6	87.8	86.5	90.3	89.0	87.8	85.1	84.4	81.7	74.1	73.8	72.6
YIELDS, WT %/°												
HYDROGEN	0.4	0.9	1.1	0.7	0.8	1.0	1.2	1.3	1.7	2.7	2.7	3.0
WATER	45.5	43.4	42.7	45.3	45.0	44.5	40.2	43.6	41.0	35.1	34.8	34.5
CO	14.0	19.4	20.6	16.8	18.1	18.9	22.9	22.8	24.6	31.5	32.4	33.2
CO <sub>2</sub>	2.1	1.6	1.4	1.7	1.7	1.1	1.1	0.8	0.8	1.2	1.3	1.3
TOTAL HYDROCARBON	38.0	34.7	34.3	35.6	34.4	34.6	34.6	31.5	31.9	28.5	28.8	28.0
HC SELECTIVITY, WT %/°												
METHANE	20.7	26.5	28.4	25.6	27.4	25.8	28.0	28.3	30.3	30.4	33.2	34.5
ETHENE	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
ETHANE	2.7	3.5	3.8	3.4	3.7	3.3	3.5	3.6	3.8	4.7	5.2	5.3
PROPENE	0.1	0.3	0.4	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2
PROPANE	1.8	2.3	2.5	2.0	2.2	2.9	2.8	4.7	4.0	5.5	5.6	5.3
BUTENES	0.9	1.5	1.8	1.3	1.3	0.8	0.9	0.6	0.7	0.9	0.9	0.9
I-BUTANE	3.4	2.1	1.6	1.7	1.6	3.7	3.0	4.4	3.2	3.5	3.4	2.9
N-BUTANE	2.0	2.2	2.2	1.9	2.0	3.0	2.6	4.4	3.6	4.8	4.6	4.3
TOTAL C <sub>4</sub> -	31.7	38.4	40.7	36.2	38.3	39.7	41.0	46.1	45.8	50.0	53.0	53.5
C <sub>5</sub> + PARAFFINS	22.8	19.3	17.0	15.8	15.8	26.0	21.4	27.5	25.5	23.7	22.6	20.9
OLEFINS	26.4	25.2	26.1	28.7	28.4	13.6	18.1	8.6	10.3	8.6	7.4	7.5
NAPHTHENES	1.8	2.9	1.1	1.0	0.9	3.6	2.3	4.6	4.0	3.7	3.6	3.2
AROMATICS	0.7	0.3	0.3	0.4	0.2	0.5	0.6	0.8	0.6	0.7	0.8	0.4
OTHERS	16.6	13.9	14.8	17.9	16.4	16.5	16.5	12.4	13.7	13.3	12.7	14.5
TOTAL C <sub>5</sub> +	68.3	61.6	59.3	63.8	61.7	60.3	59.0	53.9	54.2	50.0	47.0	46.5
YIELDS, G/SCN CONV CO+H <sub>2</sub>												
TOTAL HC	194	190	186	186	186	185	190	179	185	181	185	178
C <sub>5</sub> +	132	117	110	119	115	112	112	96	100	91	87	83
OLEFINS, WT %/° BY C NO.												
C <sub>2</sub>	1.4	2.5	1.6	1.5	1.4	1.1	1.1	0.9	0.9	0.9	1.0	0.8
C <sub>3</sub>	6.2	11.1	13.9	10.8	9.0	6.4	5.8	2.5	3.7	3.6	3.7	4.2
C <sub>4</sub>	14.2	26.3	31.8	26.1	27.0	11.2	13.6	6.3	9.1	9.6	10.0	11.6
C <sub>5</sub>	30.7	43.8	48.9	45.3	46.4	19.0	25.5	12.1	16.0	13.5	14.7	17.0
90 PCT OH, RAW PROD., °P	361	387	386	387	386	372	377	363	366	366	370	372
OCTANE NO. ON RAW PROD.												
R+0	83.4	83.5	83.5	83.8	85.0	79.2	81.4	76.1	79.8	74.0	77.0	78.0
R+3	94.0	94.2	93.3	93.9	94.1	91.4	-	-	94.7	-	-	-
OXYGENATES, WT %/°			0.4	0.3	0.2	-	-	-	-	-	-	-

TABLE D44

## MATERIAL BALANCES FROM FLUID BENCH-SCALE UNIT WITH CATALYST SGF-B-1

	35- 1	35- 2	35- 3	35- 4	35- 5	35- 6	36- 1	36- 2	36- 3	36- 4	36- 5
RUN NUMBER 225-	1.9	2.9	3.9	4.9	5.9	6.9	1.1	2.1	3.1	4.3	5.5
RUN DAYS-ON-STREAM	1.9	2.9	3.9	4.9	5.9	6.9	8.5	9.5	10.5	11.7	12.9
CUM. DAYS-ON-STREAM	2.1	2.1	2.1	2.1	2.1	2.1	4.97	4.99	5.00	5.01	5.04
FRESH FEED H <sub>2</sub> /CO RATIO	4.97	5.06	5.01	5.04	5.01	5.01	4.07	4.03	4.03	4.03	4.04
GHSV, HR <sup>-1</sup> (CHG BASIS)	4.01	4.02	4.04	4.02	4.09	4.03	2.00	2.01	2.02	2.00	2.00
RECYCLE RATIO	2.01	2.01	2.01	2.00	2.01	2.00	4.29	4.26	4.32	4.35	4.36
REACT. PRESS., PSIG	4.32	4.30	4.27	4.31	4.33	4.34	5.00	5.00	5.00	5.00	5.00
REACT. INLET TEMP., °F	5.00	5.00	5.00	5.00	5.00	5.00	95.7	95.7	95.5	95.1	94.3
NON. REACT. TEMP., °F	85.3	81.8	82.6	79.7	80.4	79.5	82.4	80.8	80.1	80.4	79.6
CONVERSIONS, MOL %/°	93.6	91.9	92.0	90.6	90.7	90.1	91.9	90.7	90.5	90.3	89.3
H <sub>2</sub>	0.3	0.4	0.5	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.7
CO	46.2	45.5	45.3	45.2	44.9	44.2	46.0	44.9	44.4	44.7	45.6
YIELDS, WT %/°	12.8	15.8	15.1	17.7	17.1	17.9	15.3	16.8	17.4	17.1	18.0
HYDROGEN	2.6	1.1	1.9	0.7	1.0	1.8	1.6	1.6	1.6	1.7	1.6
WATER	38.1	37.1	37.2	35.9	36.3	35.4	36.6	36.1	36.1	35.9	34.2
CO <sub>2</sub>	16.6	18.7	20.6	20.6	21.9	21.9	17.2	19.0	20.0	22.6	21.6
TOTAL HYDROCARBON	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0
HC SELECTIVITY, WT %/°	2.4	2.7	2.9	3.0	3.2	3.3	2.6	2.9	3.0	3.3	3.3
METHANE	0.1	0.2	0.2	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.3
ETHANE	1.4	1.3	1.4	1.5	1.6	1.7	1.6	1.7	1.6	1.8	1.8
PROPENE	1.0	0.8	1.2	1.5	1.5	1.6	1.1	1.1	1.3	1.3	1.4
PROPANE	2.4	1.4	1.3	1.1	0.9	0.7	2.7	2.2	1.9	1.4	0.9
BUTENES	1.6	1.0	1.4	1.5	1.5	1.5	1.8	1.7	1.7	1.6	1.6
I-BUTANE	25.4	26.0	29.1	29.6	31.1	31.2	27.3	28.8	29.8	32.4	30.9
N-BUTANE	21.9	14.4	13.8	12.5	10.8	10.0	21.8	17.5	16.2	13.4	12.1
TOTAL C <sub>4</sub> -	34.6	37.9	37.5	38.7	38.5	39.7	30.8	32.9	35.4	34.6	36.1
C <sub>5</sub> + PARAFFINS	1.1	0.7	0.5	0.4	0.7	0.2	1.1	0.7	0.8	0.5	0.4
OLEFINS	0.6	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2
NAPHTHENES	16.3	20.7	18.9	18.6	18.8	18.6	18.8	19.9	17.6	19.0	20.3
AROMATICS	74.6	74.0	70.9	70.4	68.9	68.8	72.7	71.2	70.2	67.6	69.1
OTHERS	188	188	188	185	187	183	186	188	186	185	185
TOTAL C <sub>5</sub> + OLEFINS, WT %/° BY C NO.	140	139	133	130	129	126	136	134	130	125	128
YIELDS, G/SCM CONV CO+H <sub>2</sub>	1.7	1.8	1.7	1.9	1.8	1.9	2.0	1.6	1.7	1.6	1.5
TOTAL HC	4.9	12.3	12.6	15.7	15.1	18.1	9.2	8.3	11.6	11.8	12.5
C <sub>5</sub> + C <sub>2</sub>	20.0	24.1	30.9	37.6	39.2	42.1	19.6	22.6	27.0	30.3	35.2
C <sub>3</sub>	39.3	43.6	53.7	58.4	60.8	64.3	35.9	42.5	47.4	51.4	56.5
C <sub>4</sub>	388	392	-	376	-	376	369	-	375	387	-
90 PCT OH, RAW PROD., °F	82.9	84.0	-	84.5	-	84.3	83.6	-	83.8	-	83.4
OCTANE NO. ON RAW PROD.	93.6	96.6	94.2	-	96.3	-	-	93.7	-	94.4	-
R+0	-	-	-	-	-	-	-	-	-	-	-
R+3	-	-	-	-	-	-	-	-	-	-	-
OXYGENATES, WT %/°	-	-	-	-	0.3	-	-	0.2	-	-	-



TABLE D45

## MATERIAL BALANCES FROM FLUID BENCH-SCALE UNIT WITH CATALYST SCF-B-1

	37- 1	37- 2	37- 3	37- 4	37- 5	38- 1	38- 2	39- 1	39- 2	39- 3	39- 4	39- 5
RUN NUMBER 225-	1.3	2.3	3.5	4.7	5.6	1.1	2.0	1.5	2.4	3.3	4.3	5.3
RUN DAYS-ON-STREAM	14.7	15.7	16.9	18.1	19.0	20.7	21.6	23.6	24.5	25.4	26.4	27.4
CUM. DAYS-ON-STREAM	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.0
FRESH FEED H <sub>2</sub> /CO RATIO	491	498	497	498	499	497	501	506	499	499	501	500
GHSV, HR <sup>-1</sup> (CHG BASIS)	4.12	3.97	4.03	4.04	4.04	4.00	4.00	4.03	4.03	4.09	4.01	4.04
RECYCLE RATIO	200	201	200	201	200	201	201	201	201	200	200	201
REACT. PRESS., PSIG	432	432	436	440	432	421	423	436	433	425	429	431
INLET TEMP., °F	500	500	500	500	500	500	500	500	500	500	500	500
CONVERSIONS, MOL %	96.3	95.5	94.5	94.7	94.1	93.8	88.1	93.7	93.1	92.6	92.0	91.5
H <sub>2</sub>	82.1	81.3	80.4	80.7	78.3	75.2	72.9	82.0	79.9	78.4	76.7	75.3
CO	91.6	90.8	89.8	90.1	89.0	87.6	83.0	89.9	88.8	88.0	86.9	86.2
H <sub>2</sub> +CO	0.5	0.6	0.7	0.7	0.8	0.8	1.5	0.8	0.9	1.0	1.0	1.1
HYDROGEN	45.8	45.8	45.4	44.7	43.0	40.1	42.9	46.5	45.2	42.7	45.1	44.0
WATER	15.7	16.3	17.2	16.9	19.0	21.8	23.8	15.7	17.5	18.8	20.4	21.6
CO	1.5	1.6	1.4	1.7	1.7	1.9	1.7	1.3	1.2	1.3	1.3	1.4
CO <sub>2</sub>	36.5	35.8	35.3	36.0	35.5	35.4	30.1	35.7	35.2	36.3	32.3	32.0
TOTAL HYDROCARBON	18.2	20.1	21.5	24.1	24.4	24.8	30.9	22.5	22.0	23.1	24.9	27.6
HC SELECTIVITY, WT %	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1
METHANE	2.7	3.0	3.2	3.6	3.5	3.7	4.9	3.3	3.2	3.4	3.6	4.0
ETHANE	0.1	0.2	0.3	0.2	0.3	0.2	0.3	0.1	0.2	0.2	0.2	0.3
PROPENE	1.7	1.8	1.9	2.0	1.8	2.7	2.8	2.5	2.1	2.0	2.0	2.3
PROPANE	0.9	1.1	1.3	1.4	1.5	1.1	1.2	1.0	1.2	1.2	1.3	1.6
BUTENES	2.9	2.3	1.8	1.6	1.3	4.7	2.7	3.1	2.4	1.9	1.5	1.6
I-BUTANE	1.9	1.8	1.9	1.8	1.7	2.6	2.6	2.3	2.1	2.0	1.8	2.1
N-BUTANE	28.5	30.3	31.8	34.9	34.6	39.9	45.3	34.8	33.2	33.9	35.4	39.5
TOTAL C <sub>4</sub> -	21.4	19.4	18.9	17.5	14.3	24.8	18.8	23.5	20.8	19.8	16.9	15.0
C <sub>5</sub> + PARAFFINS	28.1	28.7	28.8	31.8	32.0	17.1	17.7	21.3	24.7	26.4	27.6	26.5
OLEFINS	1.2	1.8	2.0	2.0	1.2	2.7	1.7	2.8	2.2	2.0	1.3	1.2
NAPHTHENES	0.4	0.3	0.2	0.4	0.2	0.3	0.6	0.3	0.2	0.2	0.2	0.2
AROMATICS	20.4	19.6	18.2	13.4	17.7	15.3	15.9	17.3	19.0	17.8	18.7	17.6
OTHERS	71.5	69.7	68.2	65.1	65.4	60.1	54.7	65.2	66.8	66.1	64.6	60.5
TOTAL C <sub>5</sub> + PARAFFINS	189	185	186	189	185	193	172	185	184	191	174	175
TOTAL HC	135	129	127	123	121	116	94	121	123	126	113	106
C <sub>5</sub> + PARAFFINS	1.4	1.5	1.7	1.7	1.8	1.5	1.5	1.2	1.5	1.7	1.8	1.7
C <sub>2</sub>	7.6	9.8	11.9	11.3	14.5	6.6	8.5	2.0	8.1	9.5	10.9	11.7
C <sub>3</sub>	16.3	21.2	26.3	29.1	34.4	12.6	19.0	14.9	20.5	24.1	27.6	29.6
C <sub>4</sub>	32.5	40.1	46.5	50.0	55.0	26.8	30.6	29.1	36.5	41.7	45.3	47.0
C <sub>5</sub>	387	-	393	-	388	386	-	385	-	382	385	391
90 PCT OH, RAW PROD., °F	82.8	-	83.1	-	83.9	82.8	-	83.2	-	82.5	-	82.8
OCTANE NO. ON RAW PROD.	-	94.2	-	94.7	-	-	94.4	-	94.6	-	93.8	-
R+0	-	-	-	-	-	-	-	-	-	-	-	-
R+3	-	0.3	-	-	-	-	0.2	-	-	-	-	-
OXYGENATES, WT %	-	-	-	-	-	-	-	-	-	-	-	-

TABLE D46

MATERIAL BALANCES FROM FLUID BENCH-SCALE UNIT WITH CATALYST SGF-B-1

	40-2	40-3	40-4	41-1	41-2	41-3	41-4	41-5	41-6	41-7
RUN NUMBER 225-	2.6	3.7	4.7	1.2	2.2	3.3	4.3	5.1	6.1	7.2
RUN DAYS-ON-STREAM	30.6	31.7	32.7	34.3	35.3	36.4	37.4	38.2	39.2	40.3
CUM. DAYS-ON-STREAM	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.2	2.1
FRESH FEED H <sub>2</sub> /CO RATIO	506	503	503	499	501	507	506	504	505	499
GHSV, HR <sup>-1</sup> (CHG BASIS)	4.05	4.05	3.97	4.04	4.06	4.05	4.09	4.04	3.99	4.01
RECYCLE RATIO	200	200	200	201	200	200	200	200	201	201
REACT. PRESS., PSIG	443	435	442	439	429	423	420	420	430	434
ACT. INLET TEMP., °F	500	500	500	500	500	500	500	500	500	500
NOM. REACT. TEMP., °F										
CONVERSIONS, MOL %	89.1	86.0	88.3	93.7	91.8	90.6	91.9	90.6	90.4	89.1
H <sub>2</sub>	79.1	76.5	77.2	85.4	82.6	80.0	80.6	81.1	79.2	75.3
CO	85.8	82.8	84.6	91.0	88.8	87.2	88.2	87.5	86.8	84.6
H <sub>2</sub> +CO										
YIELDS, WT %	1.4	1.8	1.5	0.8	1.1	1.2	1.1	1.2	1.3	1.4
HYDROGEN	44.0	42.2	40.5	45.8	46.0	43.0	43.7	43.7	44.2	41.9
WATER	18.3	20.6	20.0	12.8	15.2	17.4	16.9	16.5	18.0	21.5
CO	1.5	1.4	1.7	1.7	1.5	1.7	2.0	1.4	0.9	1.8
C <sub>2</sub>	34.8	34.0	36.3	38.9	36.2	36.7	36.4	37.1	35.6	33.4
TOTAL HYDROCARBON										
HC SELECTIVITY, WT %	29.6	34.6	34.9	28.0	29.2	33.1	34.2	31.9	33.2	30.3
METHANE	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
ETHENE	4.4	5.1	5.2	4.3	4.4	5.0	5.2	4.8	5.0	4.5
ETHANE	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
PROPENE	2.9	3.3	3.4	3.6	3.3	3.6	3.7	3.4	3.4	2.9
PROPANE	0.9	1.0	1.1	0.7	0.8	0.9	0.9	0.9	1.0	1.2
BUTENES	2.5	2.3	2.1	3.6	2.3	2.3	2.3	2.0	1.9	1.8
I-BUTANE	2.6	2.8	2.8	3.2	3.0	3.0	3.0	2.8	2.8	2.6
N-BUTANE	43.1	49.3	49.8	43.6	43.1	48.0	49.5	46.0	47.3	43.5
TOTAL C <sub>4</sub> -	20.4	17.9	16.7	24.5	22.4	18.7	18.3	18.4	17.6	15.9
C <sub>5</sub> + PARAFFINS	16.9	14.7	15.9	13.6	14.7	14.6	15.5	15.3	15.9	20.8
OLEFINS	2.7	2.0	1.7	3.2	3.2	2.2	2.1	2.3	2.4	2.1
NAPHTHENES	0.2	0.4	0.2	0.3	0.5	0.2	0.2	0.2	0.2	0.2
AROMATICS	16.6	15.6	15.7	14.8	16.2	16.3	14.4	17.7	16.5	17.4
OTHERS	56.9	50.7	50.2	56.4	56.9	52.0	50.5	54.0	52.7	56.5
TOTAL C <sub>5</sub> +										
YIELDS, G/SCM CONV CO+H <sub>2</sub>	191	193	202	198	190	195	192	200	187	185
TOTAL HC	109	98	102	112	108	102	97	108	98	104
C <sub>5</sub> +										
OLEFINS, WT % BY C NO.	1.1	1.1	1.1	0.8	0.9	0.9	0.8	0.9	1.0	1.3
C <sub>2</sub>	5.4	5.9	5.5	3.2	3.1	3.1	3.0	2.5	1.5	7.5
C <sub>3</sub>	14.8	17.0	17.7	8.7	13.9	14.3	14.8	16.1	17.3	21.9
C <sub>4</sub>	28.2	29.7	30.9	19.3	25.8	27.4	28.3	29.9	31.5	37.6
C <sub>5</sub>	379	375	377	372	-	385	-	389	402	413
90 PCT OH, RAW PROD., °F										
OCTANE NO. ON RAW PROD.										
R+0	94.0	82.4	83.8	79.5	93.7	81.2	93.7	81.7	94.9	82.4
R+3	-	-	-	-	-	-	-	-	-	-
OXYGENATES, WT %	-	-	-	-	0.1	-	-	-	-	-

TABLE D47

## GAS COMPOSITION OVER CATALYST, MOL PCT

RUN NO., 225-	17- 1	17- 2	17- 3	17- 4	17- 5	17- 6	17- 7	17- 8
HYDROGEN	34.11	37.48	38.89	56.60	62.32	60.10	51.13	52.03
CO	30.51	30.50	29.15	33.47	28.07	29.27	31.96	30.71
CO2	2.70	2.29	1.89	0.34	0.18	0.20	0.45	0.43
NITROGEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METHANE	28.01	25.55	25.95	8.00	7.86	8.68	13.85	14.15
ETHENE	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.02
ETHANE	2.05	1.86	1.83	0.55	0.55	0.61	1.00	1.03
PROPENE	0.05	0.05	0.05	0.07	0.06	0.06	0.14	0.07
PROPANE	0.75	0.66	0.72	0.23	0.25	0.29	0.39	0.47
I-BUTANE	0.41	0.31	0.23	0.03	0.03	0.03	0.07	0.07
1-BUTENE	0.12	0.12	0.11	0.08	0.07	0.08	0.09	0.09
N-BUTANE	0.37	0.33	0.34	0.12	0.13	0.15	0.24	0.24
TRANS-2-BUTENE	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06
CIS-2-BUTENE	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
UNKNOWN C4-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-METHYL-1-BUTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I-PENTANE	0.23	0.19	0.15	0.04	0.04	0.04	0.07	0.07
1-PENTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-METHYL-1-BUTENE	0.04	0.04	0.04	0.02	0.02	0.02	0.03	0.03
N-PENTANE	0.14	0.13	0.13	0.06	0.07	0.07	0.11	0.11
TRANS-2-PENTENE	0.03	0.03	0.03	0.02	0.02	0.02	0.03	0.03
CIS-2-PENTENE	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
2-METHYL-2-BUTENE	0.14	0.14	0.14	0.09	0.08	0.09	0.11	0.11
UNKNOWN C5-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CYCLOPENTANE	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
C6+ HC	0.24	0.22	0.21	0.17	0.16	0.19	0.22	0.23
H2/CO	1.12	1.23	1.33	1.69	2.22	2.05	1.60	1.69
RECYCLE RATIO	1.9	1.9	2.0	2.7	2.4	2.2	1.9	1.9

TABLE D48

## GAS COMPOSITION OVER CATALYST, MOL PCT

RUN NO., 225-	19- 1	19- 2	19- 3	19- 4	19- 5	19- 6	19- 7
HYDROGEN	38.24	40.03	50.32	50.09	50.25	43.43	43.80
CO	28.63	29.78	33.16	32.17	31.95	31.14	30.75
CO2	3.39	2.83	0.59	0.56	0.56	1.66	1.66
NITROGEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METHANE	25.30	23.43	12.83	13.51	13.55	20.04	20.13
ETHENE	0.02	0.02	0.02	0.02	0.02	0.02	0.02
ETHANE	1.87	1.69	1.06	1.11	1.11	1.54	1.54
PROPENE	0.02	0.06	0.14	0.23	0.23	0.12	0.12
PROPANE	0.76	0.64	0.61	0.87	0.87	0.73	0.73
I-BUTANE	0.46	0.28	0.06	0.04	0.04	0.07	0.07
1-BUTENE	0.12	0.13	0.08	0.08	0.08	0.12	0.11
N-BUTANE	0.37	0.33	0.30	0.39	0.40	0.32	0.32
TRANS-2-BUTENE	0.04	0.05	0.11	0.17	0.17	0.10	0.10
CIS-2-BUTENE	0.02	0.03	0.06	0.10	0.10	0.06	0.06
UNKNOWN C4-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-METHYL-1-BUTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I-PENTANE	0.26	0.17	0.08	0.07	0.07	0.08	0.08
1-PENTENE	0.00	0.00	0.01	0.01	0.01	0.01	0.01
2-METHYL-1-BUTENE	0.03	0.04	0.03	0.03	0.03	0.04	0.04
N-PENTANE	0.14	0.12	0.12	0.15	0.15	0.12	0.12
TRANS-2-PENTENE	0.02	0.03	0.05	0.08	0.08	0.04	0.04
CIS-2-PENTENE	0.01	0.01	0.02	0.03	0.03	0.02	0.02
2-METHYL-2-BUTENE	0.12	0.14	0.12	0.11	0.11	0.15	0.15
UNKNOWN C5-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CYCLOPENTANE	0.00	0.00	0.00	0.00	0.00	0.01	0.01
C6+ HC	0.18	0.19	0.22	0.19	0.19	0.19	0.14
H2/CO	1.34	1.34	1.52	1.56	1.57	1.39	1.42
RECYCLE RATIO	1.1	1.1	1.3	1.4	1.4	1.1	1.0

TABLE D49

## GAS COMPOSITION OVER CATALYST, MOL PCT

RUN NO., 225-	19- 8	19- 9	19-10	19-11	19-12	19-13	19-14
HYDROGEN	38.66	39.23	41.01	42.33	43.08	43.42	42.66
CO	29.27	30.30	31.30	31.73	34.10	32.01	31.38
CO2	3.52	3.09	2.50	2.20	1.65	1.80	2.05
NITROGEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METHANE	24.87	23.95	22.09	20.87	18.62	20.14	21.19
ETHENE	0.02	0.02	0.02	0.02	0.02	0.02	0.02
ETHANE	1.68	1.53	1.37	1.29	1.13	1.21	1.23
PROPENE	0.06	0.05	0.06	0.08	0.07	0.06	0.07
PROPANE	0.53	0.50	0.44	0.38	0.35	0.40	0.40
I-BUTANE	0.20	0.18	0.14	0.12	0.09	0.08	0.09
1-BUTENE	0.13	0.13	0.13	0.13	0.12	0.12	0.11
N-BUTANE	0.27	0.25	0.23	0.20	0.18	0.19	0.19
TRANS-2-BUTENE	0.05	0.06	0.06	0.06	0.06	0.05	0.05
CIS-2-BUTENE	0.03	0.03	0.03	0.03	0.03	0.03	0.03
UNKNOWN C4-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-METHYL-1-BUTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I-PENTANE	0.14	0.13	0.11	0.10	0.08	0.07	0.08
1-PENTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-METHYL-1-BUTENE	0.04	0.04	0.04	0.04	0.04	0.03	0.03
N-PENTANE	0.11	0.11	0.10	0.09	0.08	0.08	0.08
TRANS-2-PENTENE	0.03	0.03	0.03	0.03	0.03	0.02	0.02
CIS-2-PENTENE	0.01	0.01	0.01	0.01	0.01	0.01	0.01
2-METHYL-2-BUTENE	0.14	0.14	0.13	0.13	0.13	0.12	0.11
UNKNOWN C5-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CYCLOPENTANE	0.01	0.00	0.00	0.00	0.01	0.00	0.00
C6+ HC	0.23	0.22	0.18	0.14	0.12	0.14	0.18
H2/CO	1.32	1.29	1.31	1.33	1.26	1.36	1.36
RECYCLE RATIO	1.1	1.1	1.1	1.1	1.1	1.0	1.1

TABLE D50

## GAS COMPOSITION OVER CATALYST, MOL PCT

	20- 1	20- 5	20- 6	20- 7	20- 8	21- 1	21- 2	21- 3	21- 4	21- 5	22- 1	22- 2
<i>RUN NO., 225-</i>												
HYDROGEN	24.08	31.87	32.01	32.60	33.16	42.05	41.89	40.23	45.22	39.01	48.52	52.08
CO	32.73	35.24	35.94	35.28	35.91	36.91	36.94	34.80	36.43	34.63	35.82	34.69
CO2	2.96	1.40	1.37	1.26	1.24	0.55	0.56	0.70	0.46	0.81	0.26	0.21
NITROGEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METHANE	34.00	26.85	26.17	26.24	25.27	16.31	16.42	19.72	14.39	20.76	10.80	9.29
ETHENE	0.03	0.02	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.00
ETHANE	2.24	1.89	1.85	1.88	1.82	1.24	1.25	1.54	1.11	1.65	0.96	0.80
PROPENE	0.03	0.08	0.08	0.08	0.08	0.04	0.04	0.03	0.04	0.04	0.02	0.02
PROPANE	1.07	0.75	0.75	0.80	0.77	0.78	0.79	0.93	0.69	0.94	1.35	1.11
I-BUTANE	1.04	0.35	0.31	0.30	0.27	0.51	0.52	0.48	0.31	0.46	0.39	0.29
1-BUTENS	0.11	0.15	0.14	0.15	0.14	0.09	0.09	0.08	0.07	0.09	0.02	0.02
N-BUTANE	0.52	0.40	0.39	0.41	0.40	0.49	0.49	0.53	0.43	0.54	0.86	0.69
TRANS-2-BUTENE	0.04	0.06	0.06	0.07	0.06	0.03	0.03	0.03	0.03	0.03	0.01	0.01
CIS-2-BUTENE	0.03	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02	0.00	0.00
UNKNOWN C4-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-METHYL-1-BUTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I-PENTANE	0.49	0.22	0.20	0.20	0.18	0.33	0.33	0.31	0.24	0.32	0.31	0.24
1-PENTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-METHYL-1-BUTENE	0.03	0.04	0.05	0.05	0.04	0.03	0.03	0.02	0.02	0.02	0.00	0.00
N-PENTANE	0.19	0.16	0.16	0.17	0.16	0.23	0.23	0.22	0.20	0.24	0.36	0.30
TRANS-2-PENTENE	0.02	0.03	0.03	0.03	0.03	0.00	0.00	0.01	0.01	0.01	0.00	0.00
CIS-2-PENTENE	0.01	0.01	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-METHYL-2-BUTENE	0.12	0.16	0.16	0.16	0.15	0.09	0.09	0.08	0.08	0.09	0.02	0.02
UNKNOWN C5-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CYCLOPENTANE	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C6+ HC	0.25	0.26	0.24	0.23	0.23	0.25	0.26	0.24	0.23	0.31	0.27	0.23
H2/CO	0.74	0.90	0.89	0.92	0.92	1.14	1.13	1.16	1.24	1.13	1.35	1.50
RECYCLE RATIO	4.2	4.1	4.0	4.0	4.0	4.0	4.2	4.2	4.3	4.2	4.1	4.1

TABLE D51

## GAS COMPOSITION OVER CATALYST, MOL PCT

RUN NO., 225-	23- 1	23- 2	23- 3	24- 1	24- 2	24- 3	24- 4	24- 5
HYDROGEN	31.63	31.69	43.72	24.25	23.88	32.43	32.90	33.01
CO	30.49	30.32	32.85	32.31	39.42	35.87	34.53	35.95
CO2	1.80	1.80	0.83	2.80	3.00	1.65	1.64	1.55
NITROGEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METHANE	29.69	29.78	18.81	34.55	28.68	25.70	26.60	25.43
ETHENE	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
ETHANE	2.36	2.37	1.51	2.27	2.00	1.79	1.85	1.75
PROPENE	0.05	0.05	0.04	0.14	0.07	0.06	0.07	0.07
PROPANE	1.16	1.17	0.52	0.91	0.75	0.58	0.58	0.54
I-BUTANE	0.91	0.91	0.38	1.02	0.50	0.43	0.37	0.30
1-BUTENE	0.10	0.11	0.09	0.13	0.15	0.15	0.15	0.15
N-BUTANE	0.59	0.59	0.34	0.47	0.41	0.34	0.33	0.30
TRANS-2-BUTENE	0.04	0.04	0.04	0.04	0.06	0.06	0.06	0.07
CIS-2-BUTENE	0.02	0.02	0.02	0.03	0.04	0.03	0.04	0.04
UNKNOWN C4-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-METHYL-1-BUTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I-PENTANE	0.50	0.50	0.26	0.46	0.32	0.25	0.22	0.19
1-PENTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-METHYL-1-BUTENE	0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.05
N-PENTANE	0.22	0.22	0.17	0.17	0.19	0.15	0.14	0.13
TRANS-2-PENTENE	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03
CIS-2-PENTENE	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.02
2-METHYL-2-BUTENE	0.10	0.10	0.09	0.13	0.15	0.15	0.16	0.17
UNKNOWN C5-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CYCLOPENTANE	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
C6+ HC	0.26	0.26	0.25	0.24	0.28	0.23	0.24	0.23
H2/CO	1.04	1.05	1.33	0.75	0.61	0.90	0.95	0.92
RECYCLE RATIO	3.9	4.0	4.0	3.9	3.9	3.9	3.9	3.9

TABLE D52

## GAS COMPOSITION OVER CATALYST, MOL PCT

	25- 1	25- 2	25- 3	25- 4	25- 5	25- 6	25- 7	25- 8	25- 9
HYDROGEN	28.46	30.07	31.37	32.04	32.49	32.78	32.87	31.33	31.37
CO	34.74	38.49	39.85	38.82	37.55	38.43	38.42	38.80	38.77
CO2	2.21	2.01	1.65	1.56	1.48	1.37	1.37	1.53	1.53
NITROGEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METHANE	29.17	25.07	23.26	23.76	24.68	23.75	23.69	24.60	24.59
ETHENE	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
ETHANE	1.77	1.48	1.38	1.42	1.47	1.43	1.43	1.48	1.48
PROPENE	0.06	0.07	0.07	0.08	0.08	0.03	0.03	0.09	0.09
PROPANE	0.92	0.65	0.54	0.54	0.54	0.56	0.56	0.50	0.50
I-BUTANE	0.92	0.67	0.46	0.37	0.34	0.28	0.28	0.28	0.28
1-BUTENE	0.12	0.13	0.15	0.16	0.16	0.17	0.17	0.17	0.17
N-BUTANE	0.48	0.38	0.32	0.30	0.30	0.28	0.28	0.27	0.27
TRANS-2-BUTENE	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.06	0.06
CIS-2-BUTENE	0.03	0.03	0.03	0.04	0.03	0.04	0.04	0.04	0.04
UNKNOWN C4-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-METHYL-1-BUTENE	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
I-PENTANE	0.44	0.32	0.25	0.21	0.19	0.17	0.17	0.16	0.16
1-PENTENE	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
2-METHYL-1-BUTENE	0.03	0.04	0.05	0.05	0.05	0.05	0.05	0.06	0.06
N-PENTANE	0.18	0.15	0.14	0.13	0.13	0.12	0.12	0.12	0.12
TRANS-2-PENTENE	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.04	0.04
CIS-2-PENTENE	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.02	0.02
2-METHYL-2-BUTENE	0.11	0.13	0.15	0.16	0.17	0.18	0.18	0.18	0.18
UNKNOWN C5-MONOOLEFINS	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
C5-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CYCLOPENTANE	0.01	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.00
C6+ HC	0.25	0.21	0.18	0.20	0.21	0.19	0.19	0.21	0.21
H2/CO	0.82	0.78	0.79	0.83	0.87	0.85	0.86	0.81	0.81
RECYCLE RATIO	3.9	3.9	3.9	4.0	4.0	4.0	4.0	4.0	4.0



TABLE D53

## GAS COMPOSITION OVER CATALYST, MOL PCT

RUN NO., 225-	26- 1	26- 2	26- 3	26- 4	26- 5	27- 1	27- 2
HYDROGEN	29.26	29.60	32.09	39.27	43.04	32.67	48.23
CO	30.19	29.63	32.40	34.86	34.45	35.68	33.60
CO2	3.54	3.30	2.59	0.84	0.62	0.84	0.51
NITROGEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METHANE	32.05	32.45	28.55	21.06	18.46	25.76	14.81
ETHENE	0.03	0.04	0.03	0.02	0.02	0.03	0.02
ETHANE	1.80	1.82	1.57	1.32	1.16	1.67	0.99
PROPENE	0.06	0.06	0.07	0.04	0.03	0.14	0.04
PROPANE	0.82	0.84	0.69	0.68	0.60	0.86	0.46
I-BUTANE	0.73	0.73	0.58	0.52	0.37	0.71	0.27
1-BUTENE	0.09	0.09	0.10	0.08	0.08	0.11	0.07
N-BUTANE	0.47	0.48	0.41	0.42	0.37	0.51	0.31
TRANS-2-BUTENE	0.03	0.04	0.04	0.03	0.03	0.04	0.02
CIS-2-BUTENE	0.02	0.02	0.02	0.02	0.02	0.03	0.02
UNKNOWN C4-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-METHYL-1-BUTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I-PENTANE	0.39	0.39	0.34	0.32	0.25	0.39	0.21
1-PENTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-METHYL-1-BUTENE	0.02	0.02	0.02	0.02	0.02	0.02	0.02
N-PENTANE	0.19	0.19	0.18	0.19	0.17	0.21	0.16
TRANS-2-PENTENE	0.01	0.01	0.01	0.01	0.01	0.01	0.01
CIS-2-PENTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-METHYL-2-BUTENE	0.06	0.07	0.07	0.08	0.08	0.08	0.06
UNKNOWN C5-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CYCLOPENTANE	0.00	0.00	0.00	0.00	0.00	0.01	0.00
C6+ HC	0.22	0.23	0.23	0.21	0.19	0.23	0.20
H2/CO	0.97	1.00	0.99	1.13	1.25	0.92	1.44
RECYCLE RATIO	4.0	4.0	4.0	4.0	4.1	3.9	4.0

TABLE D54

## GAS COMPOSITION OVER CATALYST, MOL PCT

RUN NO., 225-	28- 1	28- 2	28- 3	28- 4	28- 5	29- 1	29- 2	30- 1	30- 2	31- 1	31- 2	31- 3
HYDROGEN	25.24	36.03	39.43	30.32	31.15	35.74	36.84	35.70	44.85	44.90	44.88	48.06
CO	37.37	36.18	34.72	36.13	35.63	37.01	35.91	37.11	35.13	35.09	35.09	34.56
CO2	1.49	1.47	1.06	1.76	1.66	0.92	0.85	0.92	0.74	0.74	0.74	0.66
NITROGEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METHANE	30.12	22.23	20.89	27.25	27.11	21.77	21.99	21.72	14.98	14.98	14.99	13.23
ETHANE	0.03	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.01
ETHANE	1.98	1.55	1.48	1.90	1.90	1.44	1.48	1.44	1.27	1.27	1.27	1.09
PROPENE	0.06	0.07	0.09	0.07	0.06	0.05	0.05	0.05	0.03	0.03	0.03	0.03
PROPANE	0.82	0.61	0.63	0.71	0.74	0.77	0.74	0.77	0.94	0.94	0.94	0.74
I-BUTANE	0.97	0.39	0.24	0.34	0.29	0.60	0.50	0.60	0.44	0.44	0.44	0.31
1-BUTENE	0.13	0.14	0.16	0.15	0.14	0.10	0.11	0.10	0.07	0.07	0.07	0.06
N-BUTANE	0.48	0.35	0.34	0.37	0.38	0.47	0.45	0.47	0.52	0.52	0.52	0.43
TRANS-2-BUTENE	0.05	0.05	0.07	0.06	0.06	0.04	0.04	0.04	0.02	0.02	0.02	0.02
CIS-2-BUTENE	0.03	0.03	0.04	0.04	0.04	0.02	0.02	0.02	0.01	0.01	0.01	0.01
UNKNOWN C4-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-METHYL-1-BUTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I-PENTANE	0.48	0.25	0.18	0.21	0.19	0.38	0.33	0.38	0.30	0.30	0.30	0.25
1-PENTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
2-METHYL-1-BUTENE	0.04	0.04	0.05	0.05	0.05	0.03	0.03	0.03	0.15	0.15	0.15	0.02
N-PENTANE	0.20	0.15	0.14	0.15	0.15	0.21	0.21	0.21	0.23	0.23	0.23	0.20
TRANS-2-PENTENE	0.02	0.03	0.03	0.03	0.03	0.01	0.01	0.01	0.00	0.00	0.00	0.01
CIS-2-PENTENE	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
2-METHYL-2-BUTENE	0.14	0.14	0.17	0.16	0.15	0.10	0.11	0.10	0.06	0.06	0.06	0.06
UNKNOWN C5-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CYCLOPENTANE	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00
C6+ HC	0.31	0.23	0.21	0.23	0.22	0.28	0.29	0.28	0.22	0.22	0.22	0.25
H2/CO	0.68	1.00	1.14	0.84	0.87	0.97	1.03	0.96	1.28	1.28	1.28	1.39
RECYCLE RATIO	4.0	2.3	2.4	4.1	4.1	4.1	4.1	4.0	4.0	4.0	4.0	4.0

TABLE D55

## GAS COMPOSITION OVER CATALYST, MOL PCT

	35- 1	35- 2	35- 3	35- 4	35- 5	35- 6	36- 1	36- 2	36- 3	36- 4	36- 5
RUN NO., 225-											
HYDROGEN	23.54	24.63	27.09	26.76	27.09	28.80	24.70	27.89	28.93	29.73	29.71
CO	35.21	39.99	39.56	38.94	41.19	39.15	39.11	41.08	40.40	37.67	40.25
CO <sub>2</sub>	3.54	1.64	1.38	2.46	2.30	1.15	2.52	2.14	1.95	2.05	1.93
NITROGEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METHANE	31.58	28.41	27.13	27.05	24.95	26.16	27.45	23.84	23.92	25.75	23.74
ETHANE	0.03	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.04	0.04	0.03
ETHANE	2.29	2.04	1.98	2.03	1.90	2.01	2.08	1.82	1.85	2.00	1.84
PROPENE	0.04	0.07	0.07	0.10	0.11	0.14	0.06	0.07	0.09	0.09	0.10
PROPANE	0.86	0.67	0.61	0.61	0.57	0.66	0.94	0.66	0.63	0.66	0.61
I-BUTANE	0.92	0.65	0.44	0.33	0.25	0.19	1.08	0.66	0.47	0.37	0.26
1-BUTENE	0.14	0.17	0.18	0.18	0.18	0.18	0.14	0.17	0.17	0.17	0.16
N-BUTANE	0.46	0.38	0.33	0.33	0.31	0.34	0.51	0.39	0.37	0.36	0.32
TRANS-2-BUTENE	0.05	0.06	0.07	0.08	0.10	0.12	0.06	0.07	0.08	0.08	0.07
CIS-2-BUTENE	0.03	0.03	0.04	0.05	0.06	0.08	0.04	0.05	0.05	0.05	0.04
UNKNOWN C <sub>4</sub> -MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C <sub>4</sub> -DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-METHYL-1-BUTENE	0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01
I-PENTANE	0.44	0.33	0.24	0.20	0.16	0.14	0.53	0.34	0.27	0.22	0.17
1-PENTENE	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.01
2-METHYL-1-BUTENE	0.05	0.06	0.06	0.06	0.06	0.07	0.04	0.05	0.05	0.05	0.06
N-PENTANE	0.20	0.17	0.15	0.14	0.12	0.13	0.20	0.17	0.15	0.14	0.13
TRANS-2-PENTENE	0.03	0.03	0.04	0.05	0.05	0.06	0.02	0.03	0.04	0.04	0.04
CIS-2-PENTENE	0.02	0.01	0.02	0.02	0.02	0.03	0.01	0.02	0.02	0.02	0.02
2-METHYL-2-BUTENE	0.17	0.20	0.20	0.21	0.21	0.22	0.15	0.17	0.19	0.19	0.19
UNKNOWN C <sub>5</sub> -MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
C <sub>5</sub> -DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CYCLOPENTANE	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
C <sub>6</sub> + HC	0.37	0.38	0.34	0.34	0.32	0.33	0.32	0.33	0.34	0.32	0.28
H <sub>2</sub> /CO	0.67	0.62	0.68	0.69	0.66	0.74	0.63	0.68	0.72	0.79	0.74
RECYCLE RATIO	4.0	4.0	4.0	4.0	4.1	4.0	4.1	4.0	4.0	4.0	4.0

TABLE D56

GAS COMPOSITION OVER CATALYST, MOL PCT

RUN NO., 225-	37-1	37-2	37-3	37-4	37-5	38-1	38-2	39-1	39-2	39-3	39-4	39-5
HYDROGEN	26.09	28.62	29.40	30.18	30.69	29.06	39.88	35.44	37.56	37.50	38.43	36.31
CO	37.56	40.14	39.47	37.50	37.87	39.58	35.18	36.46	36.30	36.28	37.26	37.99
CO2	2.24	2.02	2.05	2.00	1.89	1.92	1.39	1.26	1.09	1.10	1.02	1.23
NITROGEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METHANE	28.01	24.29	24.31	25.54	24.97	23.70	19.25	22.16	20.74	20.81	19.36	20.45
ETHENE	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03
ETHANE	2.05	1.83	1.84	1.94	1.88	1.84	1.63	1.69	1.59	1.59	1.49	1.58
PROPENE	0.05	0.07	0.08	0.09	0.11	0.07	0.06	0.02	0.06	0.06	0.07	0.09
PROPANE	0.96	0.69	0.66	0.66	0.62	0.86	0.64	0.73	0.65	0.65	0.58	0.59
I-BUTANE	1.06	0.63	0.47	0.37	0.29	0.98	0.47	0.52	0.40	0.40	0.30	0.28
1-BUTENE	0.12	0.14	0.16	0.17	0.17	0.12	0.11	0.14	0.15	0.15	0.15	0.15
N-BUTANE	0.52	0.40	0.38	0.37	0.34	0.49	0.38	0.41	0.38	0.38	0.35	0.34
TRANS-2-BUTENE	0.04	0.05	0.07	0.07	0.08	0.05	0.04	0.06	0.06	0.06	0.07	0.07
CIS-2-BUTENE	0.02	0.03	0.04	0.05	0.05	0.03	0.03	0.04	0.04	0.04	0.04	0.04
UNKNOWN C4-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-METHYL-1-BUTENE	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
I-PENTANE	0.54	0.33	0.27	0.23	0.19	0.52	0.30	0.31	0.25	0.25	0.21	0.19
1-PENTENE	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-METHYL-1-BUTENE	0.04	0.04	0.05	0.06	0.05	0.04	0.03	0.04	0.04	0.04	0.05	0.05
N-PENTANE	0.21	0.17	0.16	0.15	0.14	0.21	0.17	0.18	0.17	0.17	0.16	0.15
TRANS-2-PENTENE	0.02	0.03	0.03	0.04	0.04	0.03	0.02	0.02	0.03	0.03	0.03	0.03
CIS-2-PENTENE	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
2-METHYL-2-BUTENE	0.13	0.15	0.17	0.19	0.19	0.13	0.10	0.15	0.16	0.16	0.16	0.16
UNKNOWN C5-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CYCLOPENTANE	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
C6+ HC	0.32	0.34	0.32	0.32	0.35	0.33	0.28	0.32	0.29	0.30	0.23	0.25
H2/CO	0.69	0.71	0.74	0.80	0.81	0.73	1.13	0.97	1.03	1.03	1.03	0.96
RECYCLE RATIO	4.1	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.1	4.0	4.0

TABLE D57

## GAS COMPOSITION OVER CATALYST, MOL PCT

RUN NO., 225-	40-2	40-3	40-4	41-1	41-2	41-3	41-4	41-5	41-6	41-7
HYDROGEN	40.78	40.78	43.80	31.46	36.12	36.13	37.00	36.94	37.51	37.79
CO	32.28	32.29	30.22	27.80	29.21	29.21	29.72	29.86	29.53	32.01
CO2	1.19	1.19	0.98	1.82	1.34	1.34	1.42	1.42	0.93	2.02
NITROGEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METHANE	21.31	21.31	20.93	31.48	27.94	27.92	26.75	26.69	26.99	23.65
ETHANE	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
PROPANE	1.68	1.68	1.64	2.55	2.20	2.20	2.12	2.11	2.13	1.86
PROPYLENE	0.05	0.05	0.05	0.02	0.03	0.03	0.03	0.03	0.03	0.05
ISOBUTANE	0.72	0.72	0.70	1.56	1.04	1.04	0.97	0.97	0.93	0.79
1-BUTENE	0.47	0.47	0.29	1.03	0.44	0.44	0.40	0.40	0.37	0.31
N-BUTANE	0.10	0.10	0.10	0.09	0.10	0.10	0.10	0.10	0.11	0.11
TRANS-2-BUTENE	0.42	0.42	0.40	0.79	0.55	0.55	0.51	0.51	0.49	0.43
CIS-2-BUTENE	0.04	0.04	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.05
UNKNOWN C4-MONOOLEFINS	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03
C4-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-METHYL-1-BUTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-PENTENE	0.30	0.30	0.22	0.57	0.30	0.30	0.27	0.27	0.26	0.22
2-METHYL-1-BUTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N-PENTANE	0.03	0.03	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.03
TRANS-2-PENTENE	0.18	0.18	0.18	0.29	0.22	0.22	0.21	0.20	0.20	0.18
CIS-2-PENTENE	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02
2-METHYL-2-BUTENE	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
UNKNOWN C5-MONOOLEFINS	0.11	0.11	0.11	0.09	0.11	0.11	0.00	0.00	0.11	0.12
C5-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CYCLOPENTANE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C6+ HC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.26	0.26	0.25	0.32	0.27	0.27	0.36	0.36	0.26	0.28
H2/CO	1.26	1.26	1.45	1.13	1.24	1.24	1.25	1.24	1.27	1.18
RECYCLE RATIO	4.0	4.0	4.0	4.0	4.1	4.0	4.1	4.0	4.0	4.0

Figure D1

EFFECT OF HYDROGEN REGENERATION ON ACTIVITY OF CATALYST SG-B-3

(Pretreat:  $H_2$ , 600°F, 200 psig, 16 Hrs)

(Process Conditions:  $H_2/CO$ , 500 GHSV, 515°F, 200 psig)

(Regeneration:  $H_2$ , 200 psig at Temperature and Time Indicated Below)

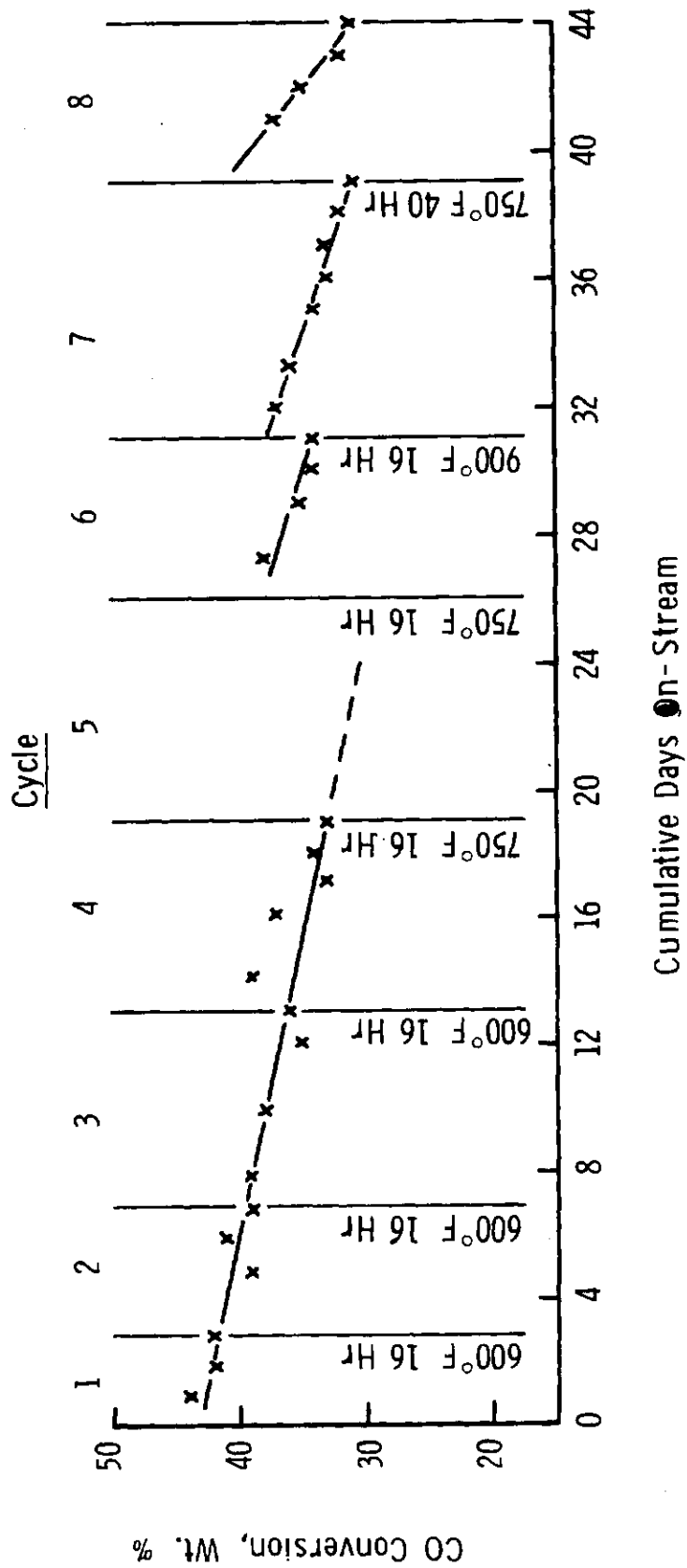


Figure D2

EFFECT OF REGENERATION ON ACTIVITY OF CATALYST SG-B-3

(Process Conditions:  $H_2/CO$ , 500 GHSV,  $515^\circ F$ )

(Regeneration: Conditions Given Below. Air Regeneration After Cycles 10 and 14 Were Followed by  $H_2$  for 10 Hr at  $600^\circ F$ , 200 psig)

× 200 psig  
 ○ 100 psig

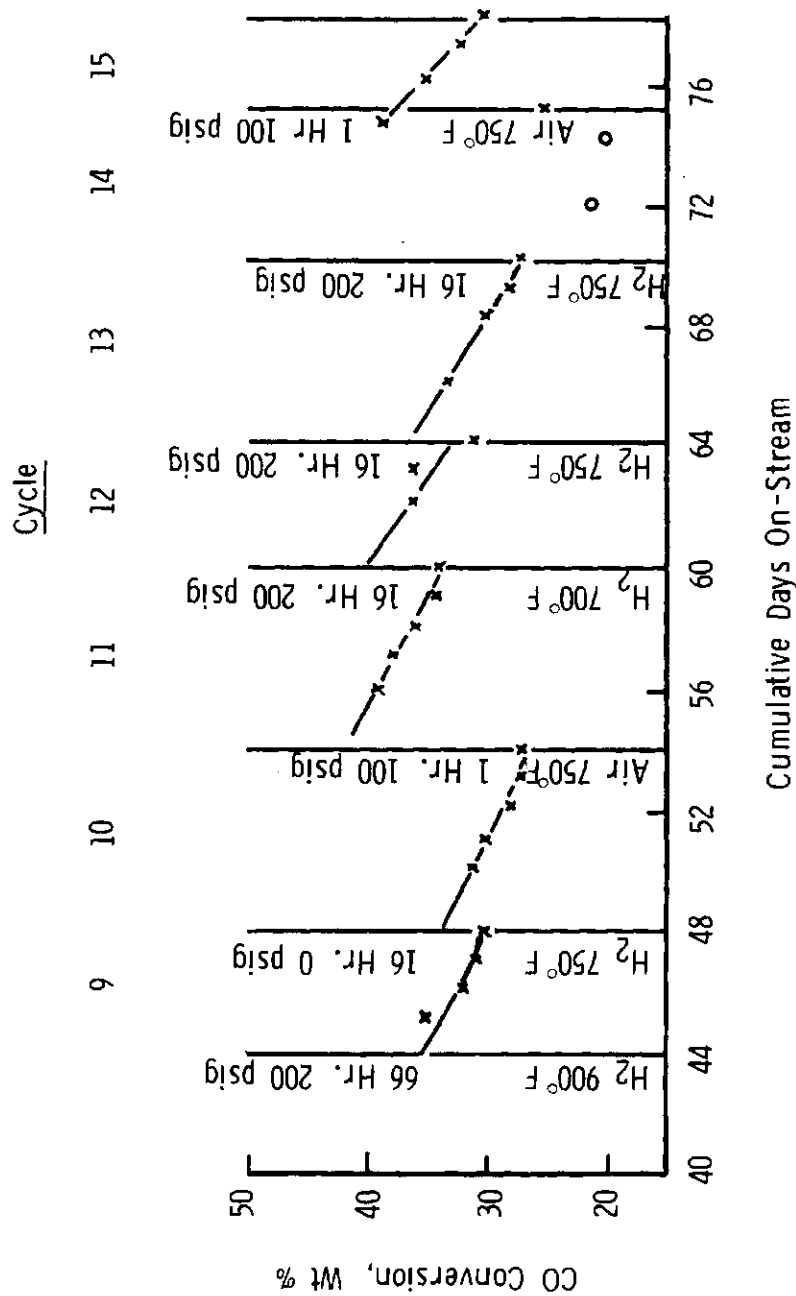


Figure D3

EFFECT OF HYDROGEN REGENERATION ON HYDROCARBON  
SELECTIVITY OF SG-B-3

(Pretreat: H<sub>2</sub>, 600°F, 200 psig, 16 Hr)

(Process Conditions: H<sub>2</sub>/CO 500 GHSV, 515°F, 200 psig)

(Regeneration: H<sub>2</sub>, 200 psig at Temperature and Time Indicated Below)

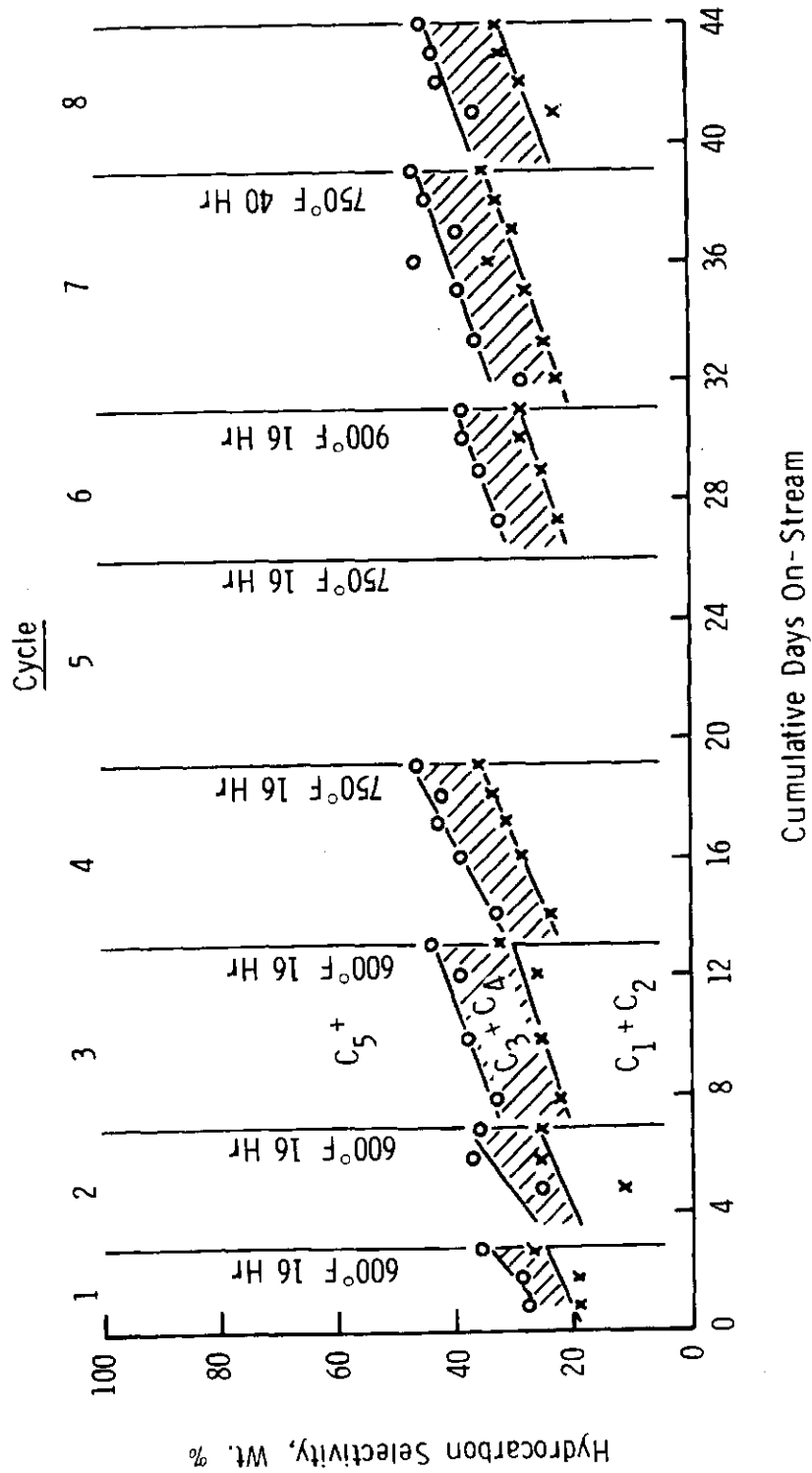




Figure D4

EFFECT OF REGENERATION ON HYDROCARBON SELECTIVITY OF SG-B-3

(Process Conditions:  $H_2/CO$  500 GHSV,  $515^\circ F$ )

(Regeneration: Conditions Given Below. Air Regenerations After Cycles 10 and 14 Were Followed by  $H_2$  for 16 Hr. at  $600^\circ F$ , 200 psig)

- x o 200 psig
- + • 100 psig

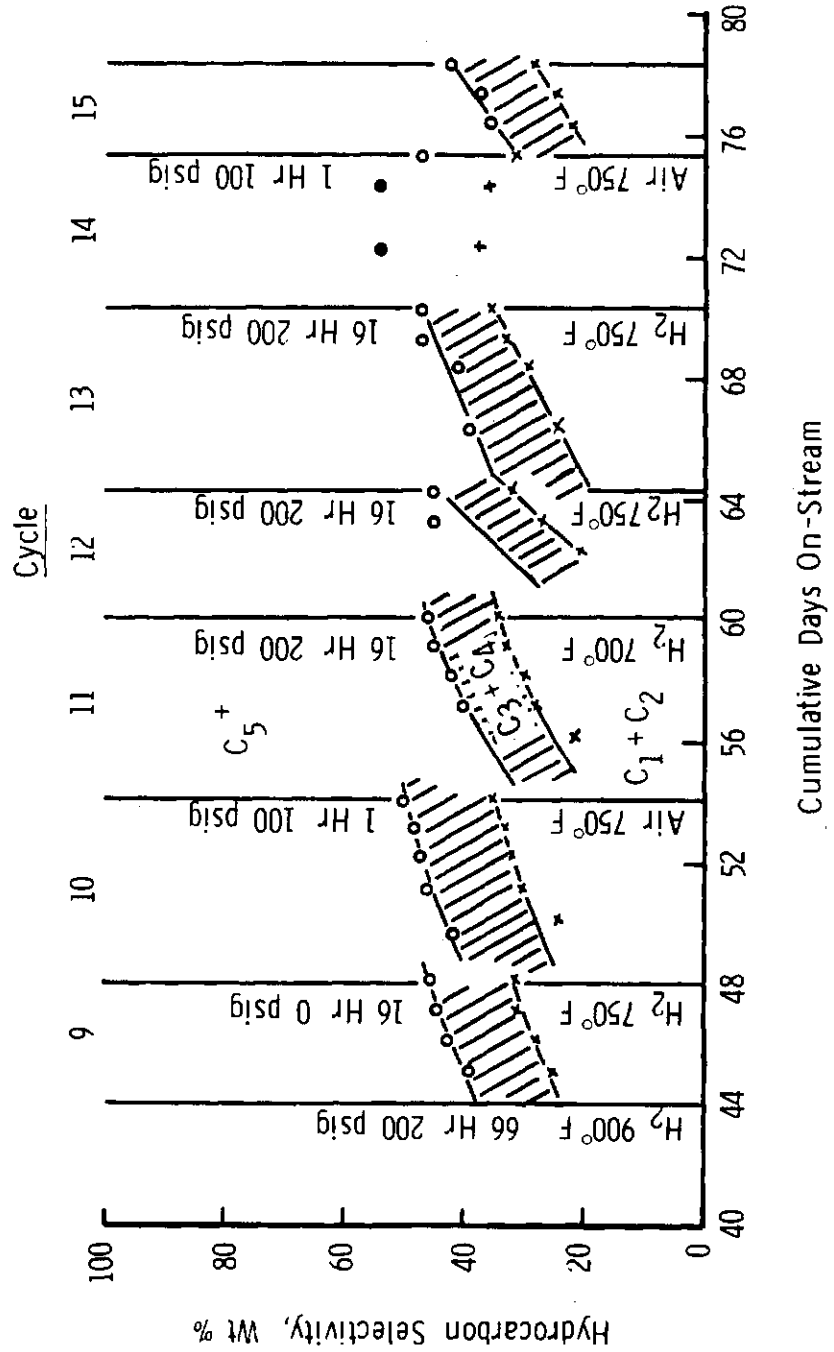


Figure D5

EFFECT OF REGENERATION ON PERFORMANCE OF SG-B-3 WHILE PROCESSING 2 H<sub>2</sub>/CO AT 500 GHSV, 500°F, AND 200 psig

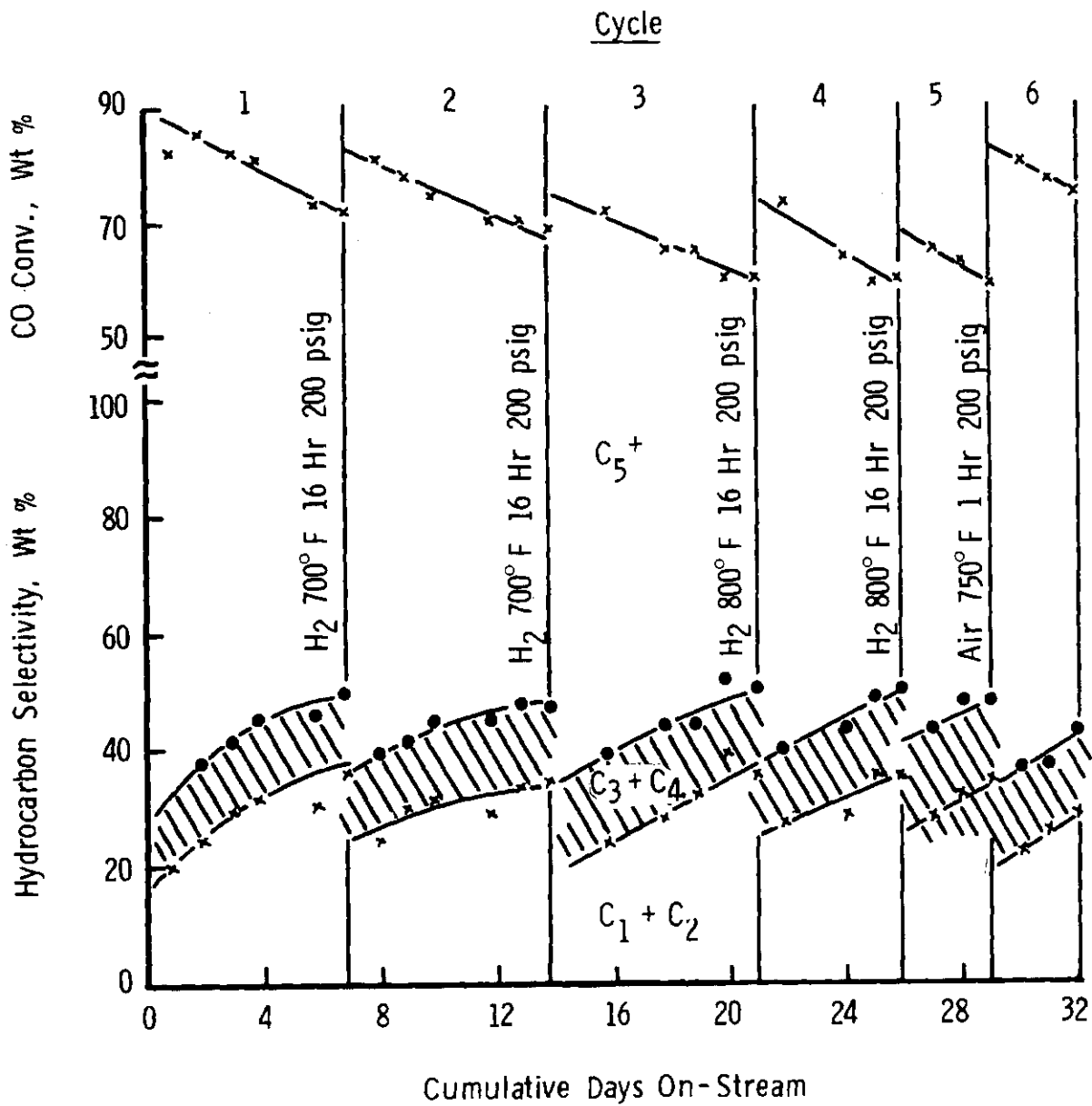


Figure D6

EFFECT OF HYDROGEN REGENERATION ON ACTIVITY OF CATALYST SG-B-3

(Process Conditions: 2 H<sub>2</sub>/CO, 530 GHSV, 200 psig)

x 500° F  
o 510° F

(Regeneration: Hydrogen at 200 psig and Conditions Given Below)

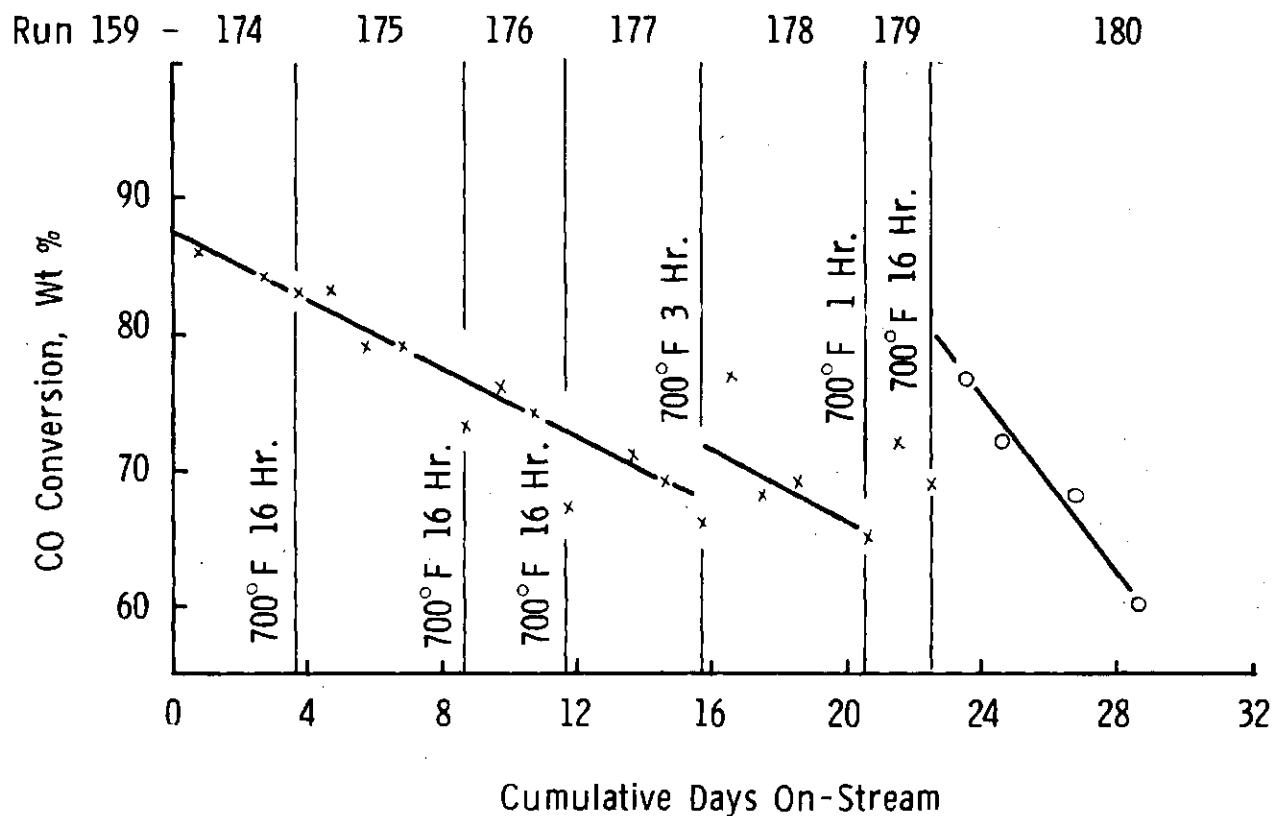


Figure D7

EFFECT OF HYDROGEN REGENERATION ON SELECTIVITY OF CATALYST SG-B-3

(Process Conditions: 2 H<sub>2</sub>/CO 530 GHSV, 200 psig)

x o 500°F  
+ ● 510°F

(Regeneration: Hydrogen at 200 psig and Conditions Given Below)

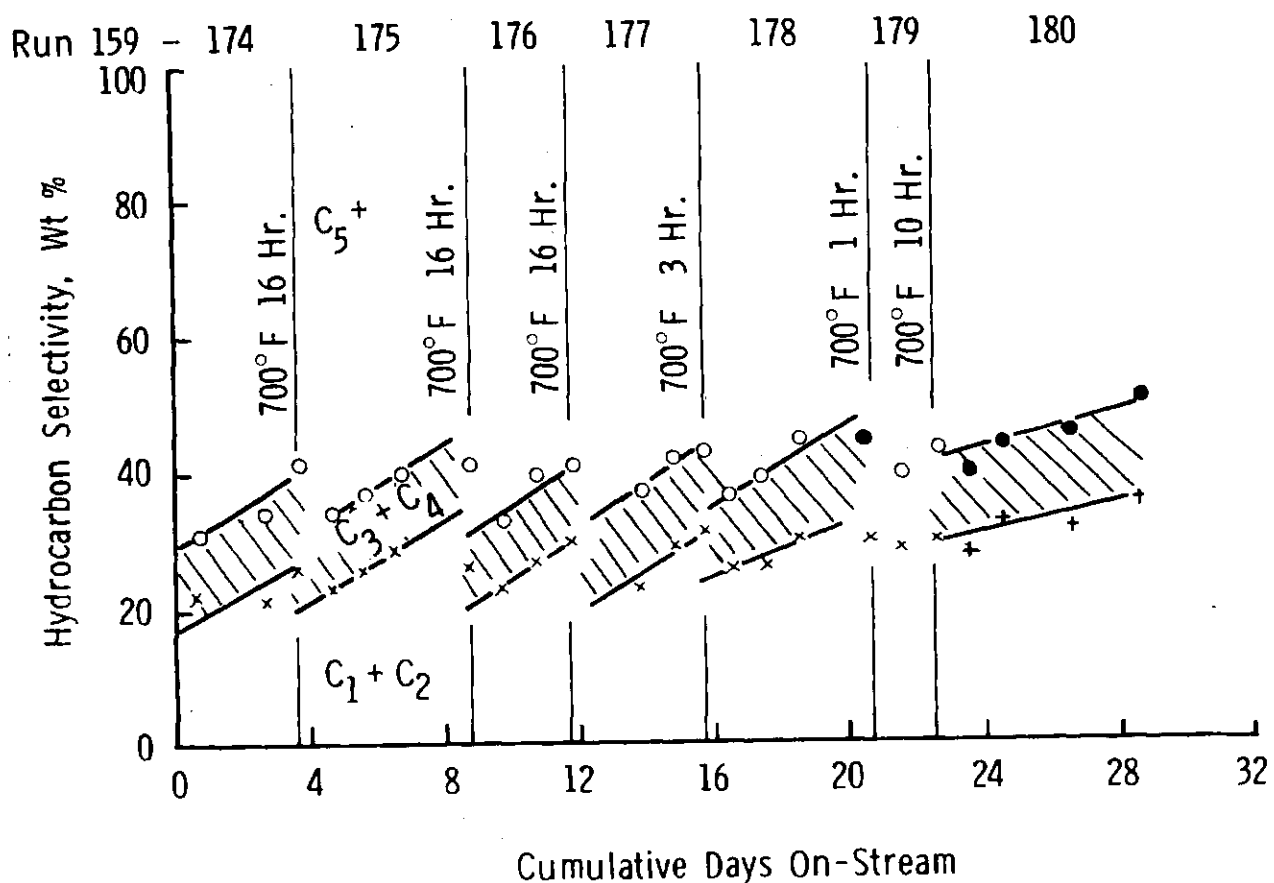


Figure D8

EFFECT OF REGENERATION ON ACTIVITY OF  
CATALYST SG-B-3

(Process Conditions: 2 H<sub>2</sub>/CO, 530 GHSV, 200 psig, 500° F)  
(Regeneration: Conditions Given Below. After 1% O<sub>2</sub> Regenerations,  
Catalyst Was Treated 1 Hr in H<sub>2</sub>, 700° F, 200 psig)

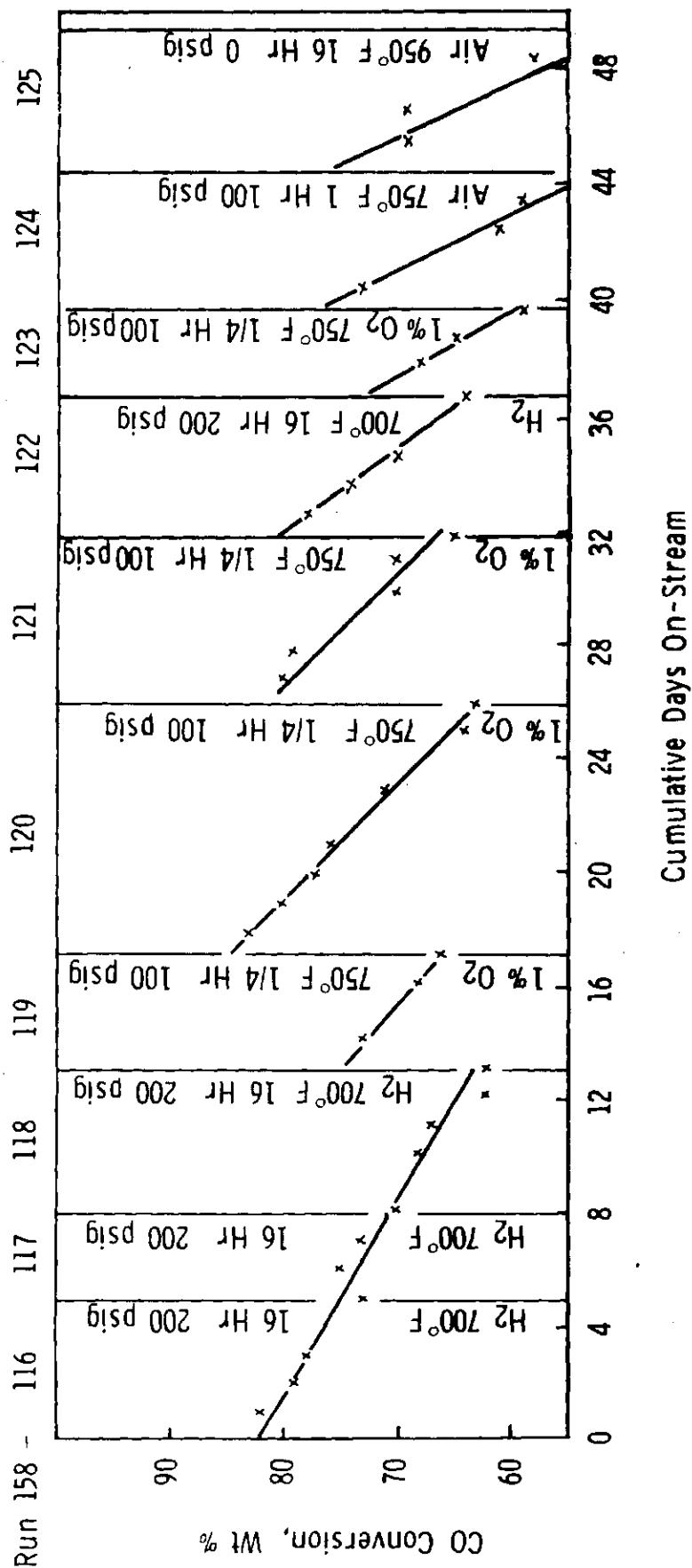


Figure D9

EFFECT OF REGENERATION ON SELECTIVITY OF  
CATALYST SG-B-3

(Process Conditions: 2 H<sub>2</sub>/CO 530 GHSV, 200 psig, 500°F)

(Regeneration: Conditions Given Below. After 1% O<sub>2</sub> Regenerating  
Catalyst Was Treated 1 Hr in H<sub>2</sub>, 700°F, 200 psig)

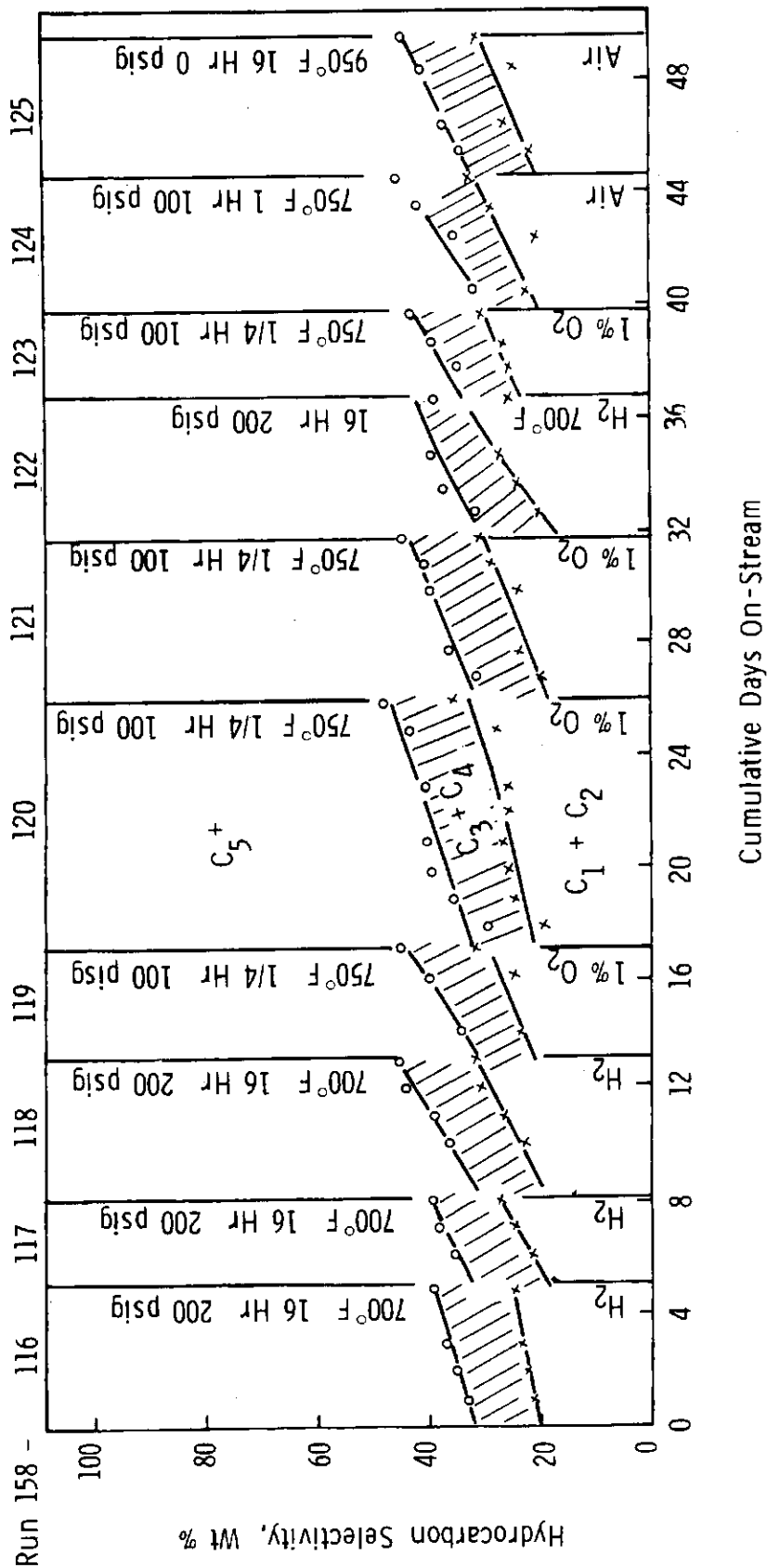


Figure D10

EFFECT OF LOW TEMPERATURE OXIDATIVE REGENERATION  
ON ACTIVITY OF CATALYST SG-B-3

(Processing: 2 H<sub>2</sub>/CO, 520 GHSV, 200 psig, 500° F)

(Regeneration: 1% O<sub>2</sub>, 100 psig, 1/4 Hr at Temperatures  
Given Below)

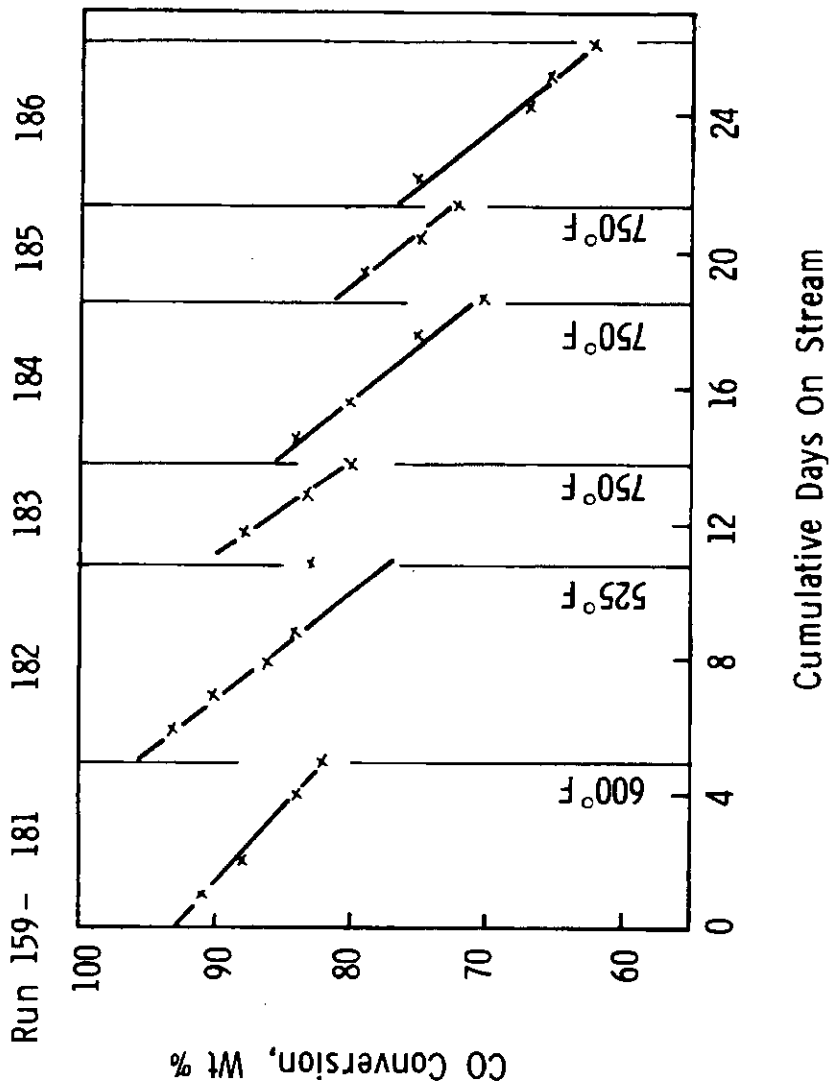


Figure D11

EFFECT OF LOW TEMPERATURE OXIDATIVE REGENERATION  
ON ACTIVITY OF CATALYST SG-B-3

(Processing: 2 H<sub>2</sub>/CO, 520 GHSV, 200 psig, 500° F)

(Regeneration: 1% O<sub>2</sub>, 100 psig, 1/4 Hr at Temperatures  
Given Below)

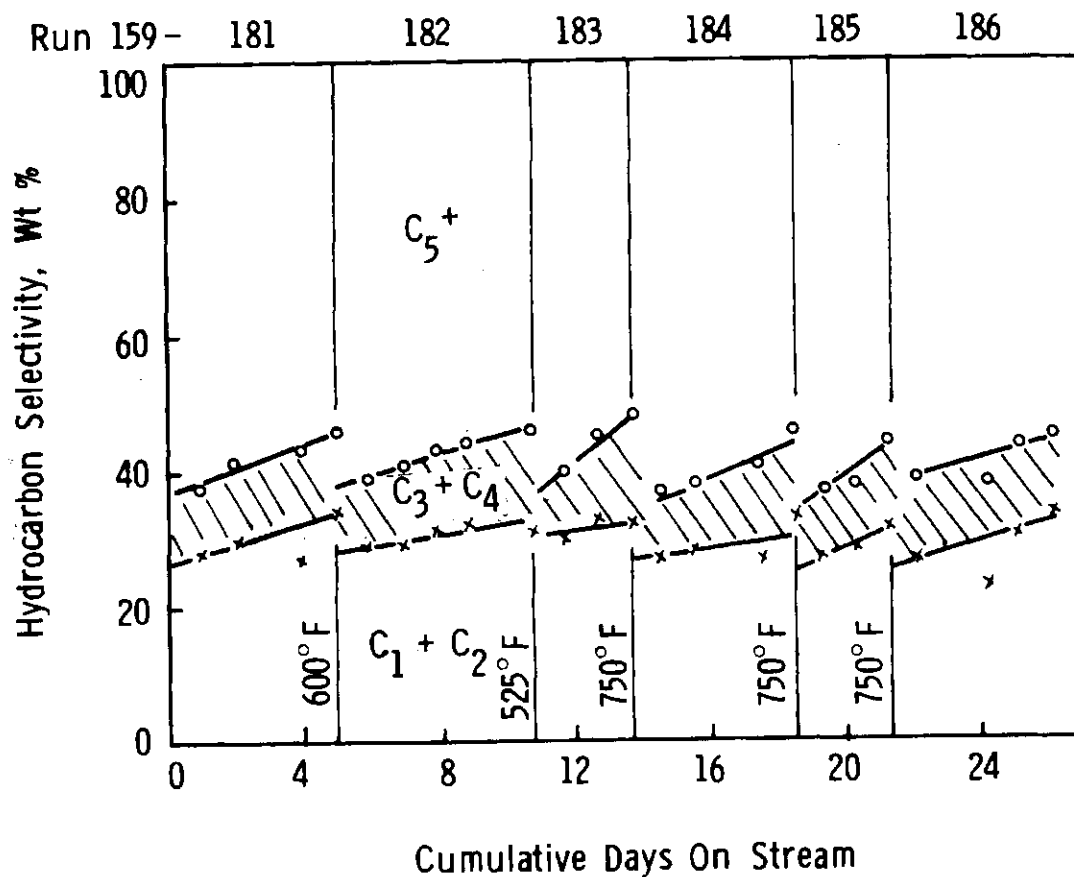




Figure D12

EFFECT OF REGENERATION ON SELECTIVITY OF CATALYST SG-B-3

(Pretreatment: H<sub>2</sub>, 950°F, 0 psig, 16 Hr)  
 (Process Conditions: Thru 158-147, 2 H<sub>2</sub>/CO 500 GHSV, 200 psig, 500°F, 158-148 280 GHSV, 200 psig, 158-149 280 GHSV, 400 psig  
 (Regeneration: Thru 158-143 and Helium Purge Followed by 1% O<sub>2</sub> at 700°F, 100 psig for 1 Hour -  
 146, 148, 149 H<sub>2</sub> for 1 Hour at 700°F, 200 psig

158-144 Also Treated 4 Hours 850°F With 10% O<sub>2</sub> Before H<sub>2</sub>, 1 Hour 700°F  
 158-145 Same as 158-144 With H<sub>2</sub> for 4 Hours at 700°F  
 158-147 Same as 158-144 With 42 Hours Soak With 2% O<sub>2</sub>, 100 psig, 675°F)

