THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 41 A From 5/31/48 Hr. 1200 to 6/1/48 Hr. 0700

FLOWS	SCFH	%
Oxygen	2870	
Nat. Gas	4340	
Total	7210	39.8
Fresh Feed	12500	
F. F. by C		
Avg. F. F.		
Wet Gas	3820	
Contraction		43.7
Recycle	18160	
Bleed	3510	
Total	21670	
Total Feed	34170	
Recycle/F.F.	1.73	
Inlet Vel.		
Steam Flow		

RUN CONDITIONS	
Generator Press.	262
O_2 Preheat, °F	458
Gas Preheat, °F	772
Reactor Press.	250
Steam Back Press.	
Temperatures, °F	
Heater Outlet	
Catalyst #1	480
#2	470
#3	499
#4	486
#5	
Average	
Product Separator	

DISTILLATIONS	A S T M	
	Raw Oil	Gaso-line
Prod.		
A.P.I.	43.5	
I.B.P.		116
5%		
10%		158
20		192
30		212
40		232
50		252
60		274
70		294
80		322
90		348
95		378
E.P.		402
Rec.		98.0
Res.		1.0
Loss.		1.0

Hempel Dist.	°F	%	A.P.I.
to 400		68.0	51.5
400-550		18.0	32.4
550+			

WATER	
Temp.	%
200	
203	
208	
A.P.I.	10.1

CATALYST DATA	
In Reactor at Start of Period	740
Fresh Catalyst Charged	
Catalyst Recharged	
Total	740
Catalyst Taken Out	.68
In Reactor at End of Period	672
Reactor d-P, H_2O	
Pounds in Reactor	
Density, lbs./cu. ft.	
Bed Height, Feet	
Space Vel. SCFH/lb. cat.	
Inventory Figures	50.8
From d-P Meters	

CATALYST ANALYSIS	Particle Size				
	Screen			Sedimentation	
Frac.	M	%	M	%
On 40	420+	13.4	80+	
100	419-150	35.8	80-40	
150	149-105	8.7	40-20	
200	104-74	9.3	20-10	
250	73-62	3.2	10-0	
325	61-44	7.9		
<325	43-0	21.7		

Density, lbs./cu. ft		Chem. Anal.	
Aerated		% Fe	
Settled		% C	
Compacted		% Oil	
Sp. Grav.	5.0	Specific Surface	
		7.2	m^2 gm

NATURAL GAS	%
CO_2	1.31
CH_4	85.00
C_2H_6	9.64
C_3H_8	3.81
C_4H_{10}	.24
N_2	
O_2	

PRODUCT INSPECTION					
	Oil	Water	Product	Pour °F	SUS @ °F
Neut. No.	34.2	8.5			
Sap. No.	31.6	8.2			
Hydrox. No.	41.8				
Bromine No.	59.2				
% Fe					
% Alc		6.5			

GENERATOR ELEMENTAL BALANCE

IN	Mol %	SCFH m/hr	C	H	O
O_2	238.08	7.44			14.88
CO_2	6.60	.15	.15		.30
CH_4	155.68	9.73	9.73	38.92	
C_2H_6	33.00	1.10	2.20	6.60	
C_3H_8	19.36	.44	1.32	3.42	
C_4H_{10}	1.74	.03	.12	.30	
N_2					
Total		18.89	13.52	49.24	15.18

OUT	Mol %	SCFH m/hr	C	H	O
CO_2	2.4	.79	.79		1.58
CO	33.9	11.18	11.18		11.18
CH_4	5.4	1.78	1.78	7.12	
H_2	57.4	18.93		37.86	
N_2	0.9	.30			
H_2O				4.84	2.42
Total		32.98	13.75	49.82	15.18

	FRESH FEED			WET GAS					RECYCLE	COMB. FEED		EFFLUENT	
					Measured		At Wt. Balance						
	%	m/hr	#/hr	%	m/hr	#/hr	m/hr	#/hr	m/hr	m/hr	%	m/hr	%
CO	33.9	11.18	313.04	10.86	1.09	30.52	2.01	56.33	6.20	17.38	19.30	8.21	10.10
H2	57.4	18.93	37.86	44.70	4.51	9.02	8.32	16.65	25.51	44.44	49.36	33.83	41.61
CO2	2.4	.79	34.76	13.62	1.38	60.72	2.55	112.07	7.81	8.60	9.55	10.36	12.74
N2	0.9	.30	8.40	.34	.03	.84	.06	1.55	.19	.49	.54	.25	.31
CH4	5.4	1.78	28.48	21.66	2.18	34.88	4.02	64.38	12.36	14.14	15.70	16.38	20.15
C2H4				2.02	.20	5.60	.37	10.34	1.15	1.15	1.28	1.52	1.87
C2H6				1.19	.12	3.60	.22	6.64	.68	.68	.76	.90	1.11
C3H6				2.02	.20	8.40	.37	15.50	1.15	1.15	1.28	1.52	1.87
C3H8				.40	.04	1.76	.07	3.25	.23	.23	.26	.30	.37
C4H8				1.68	.17	9.52	.31	17.57	.96	.96	1.07	1.27	1.56
C4H10				.18	.02	1.16	.04	2.14	.10	.10	.11	.14	.17
C5H10				.89	.09	6.30	.17	11.63	.51	.51	.57	.68	.84
C6H12				.37	.04	3.36	.07	6.20	.21	.21	.23	.28	.34
OIL								--				.00	.00
WATER												5.65	6.95
TOTAL		32.98	422.54		10.08	175.6	18.58	324.25	57.06	90.04	100.01	81.29	99.99
H2+CO		30.11			5.60		10.33						
H2/CO		1.69			4.14		4.14			2.56		4.18	

NET CHANGE ON REACTION	Carbon			Hydrogen		Oxygen	Ultimate Oil			Unsats.
	m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%
CO	- 9.17	- 9.17	17.98			- 9.17				
H2	-10.61			-21.22						
CO2	1.76	1.76	15.74			3.52				
N2	- .24									
CH4	2.24	2.24	20.04	8.96						
C2H4	.37	.74	6.62	1.48						
C2H6	.22	.44	3.94	1.32						
C3H6	.37	1.11	9.93	2.22			13.95	6.25	2.23	
C3H8	.07	.21	1.88	.56						
C4H8	.31	1.24	11.09	2.48			16.69	6.10	2.74	
C4H10	.04	.16	1.43	.40			2.14	4.86	.44	
C5H10	.17	.85	7.60	1.70			11.63	5.40	2.15	
C6H12	.07	.42	3.76	.84			6.20	5.50	1.13	
OIL		.00		.00						
WATER				1.26		(0.63) 5.65				
TOTAL	14.40		100.01				50.61		8.69	

ULTIMATE YIELDS	% C0 Fed	#/hr	H2 / C0 #/MCF	H2 / C0 g/M3	Gal/hr	H2 / C0 Gal/MCF	H2 / C0 cc/M3
C1+C2	30.60	52.88	4.23	71.53			
C3+	35.69	56.29	4.50	76.10			
C4+	23.88	37.54	3.00	50.73			
Ult. Oil		50.61	4.05	68.49	8.69	0.70	98.91
C02	15.74	77.31	6.18	104.50			
H20		101.70	8.14	137.65			

WEIGHT BALANCE	#/hr	%	#/hr
Wet Gas	175.7		323.4
Oil	19.1		19.1
Water	80.0		80.0
Total	274.8	64.9	422.5

EFFLUENT RATIOS	
H2/H20	5.99
C02/C0	1.26
(H2) (C02) / (H20) (C0)	7.56

CONTRACTION: 43.7

C0 Conversion: 82.0

H2 Conversion: 56.0

$H_2 + CO = 65.7$

Yield Calculations assume "oil" is CH2, and is found by difference on Carbon, and H20 by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at 0 C. and 14.7 psig. g/M3 = 16.91 × #/MCF. cc/M3 = 141.3 × gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 41 B From 6/1/48 Hr. 0800 to 6/2/48 Hr. 0700

FLOWS	SCFH	%
Oxygen	2640	
Nat. Gas	4260	
Total	6900	38.3
Fresh Feed	12200	
F. F. by C		
Avg. F. F.		
Wet Gas	5000	
Contraction		50.7
Recycle	18070	
Bleed	3929	
Total	21999	
Total Feed	34199	
Recycle F.F.	1.80	
Inlet Vel.		
Steam Flow		

RUN CONDITIONS	
Generator Press.	265
O_2 Preheat, °F	440
Gas Preheat, °F	709
Reactor Press.	250
Steam Back Press.	
Temperatures, °F	
Heater Outlet	
Catalyst #1	635
#2	628
#3	655
#4	620
#5	
Average	
Product Separator	

DISTILLATIONS	ASTM		Hempel Dist.		
	Prod.	Raw Oil	Gasoline	°F	%	A.P.I.
A.P.I.		46.7		to 400	74.3	53.1
I.B.P.			108	400-550	18.6	34.2
5%				550+		
10%			145			
20			174			
30			198			
40			218			
50			238			
60			260			
70			290			
80			320			
90			358			
95			384			
E.P.			408			
Rec.			98.0			
Res.			1.0			
Loss			1.0			

WATER	
Temp.	%
200	
203	
208	
A.P.I.	10.5

CATALYST DATA	
In Reactor at Start of Period	672
Fresh Catalyst Charged	100
Catalyst Recharged	
Total	772
Catalyst Taken Out	78
In Reactor at End of Period	694
Reactor d-P, H_2O	
Pounds in Reactor	
Density, lbs./cu. ft.	
Bed Height, Feet	
Space Vel. SCFH/lb. cat.	
Inventory Figures	49.3
From d-P Meters	

CATALYST ANALYSIS	Particle Size				
	Screen			Sedimentation	
	Frac.	M	%	M	%
	On 40	420+	14.1	80+	
	100	419-150	34.0	80-40	
	150	149-105	8.5	40-20	
	200	104-74	9.7	20-10	
	250	73-62	4.4	10-0	
	325	61-44	9.9		
	<325	43-0	19.4		
	Density, lbs./cu. ft			Chem. Anal.	
	Aerated			% Fe	
	Settled			% C	
	Compacted			% Oil	
	Sp. Grav.	5.0		Specific Surface	
				8.7	m^2 gm

NATURAL GAS	%
CO_2	1.53
CH_4	83.80
C_2H_6	10.30
C_3H_8	4.07
C_4H_{10}	.21
N_2	.09
O_2	

PRODUCT INSPECTION					
	Oil	Water	Product	Pour °F	SUS @ °F
Neut. No.	46.0	34.5			
Sap. No.	40.3	27.7			
Hydrox No.	57.4				
Bromine No.	59.7				
% Fe					
% Alc		8.5			

GENERATOR ELEMENTAL BALANCE

	IN Mol %	SCFH m/hr	C	H	O	OUT	Mol %	SCFH m/hr	C	H	O
O_2	223.04	6.97			13.94	CO_2	1.8	.58	.58		1.16
CO_2	7.48	.17	.17		.34	CO	34.8	11.20	11.20		11.20
CH_4	150.72	9.42	9.42	37.68		CH_4	2.8	.90	.90	3.60	
C_2H_6	34.80	1.16	2.32	6.96		H_2	60.2	19.38		38.76	
C_3H_8	20.24	.46	1.38	3.68		N_2	0.4	.13			
C_4H_{10}	1.16	.02	.08	.20		H_2O				3.84	1.92
N_2	.28	.01				Total		32.19	12.68	46.20	14.28
Total		18.21	13.37	48.52	14.28						

	FRESH FEED			WET GAS					RECYCLE	COMB. FEED		EFFLUENT		NET CHANGE ON REACTION								
					Measured		At Wt. Balance							Carbon			Hydrogen		Oxygen	Ultimate Oil			Unsats.
	%	m/hr	#/hr	%	m/hr	#/hr	m/hr	#/hr	m/hr	m/hr	%	m/hr	%	m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%
CO	34.8	11.20	313.60	7.81	1.03	28.84	1.24	34.68	4.53	15.73	17.45	5.77	7.30	- 9.96	- 9.96	11.07			- 9.96				
H2	60.2	19.38	38.76	44.97	5.93	11.86	7.13	14.26	26.06	45.44	50.42	33.19	41.98	-12.25			-24.50						
CO2	1.8	.58	25.52	19.13	2.52	110.88	3.03	133.33	11.08	11.66	12.94	14.11	17.85	2.45	2.45	21.87			4.90				
N2	0.4	.13	3.64	1.14	.15	4.20	.18	5.05	.66	.79	.88	.84	1.06	.05									
CH4	2.8	.90	25.20	19.39	2.56	4.96	3.08	49.25	11.23	12.13	13.46	14.31	18.10	2.18	2.18	19.46	8.72						
C2H4				1.99	.26	7.28	.31	8.75	1.15	1.15	1.28	1.46	1.85	.31	.62	5.54	1.24						
C2H6				1.56	.21	6.30	.25	7.58	.90	.90	1.00	1.15	1.45	.25	.50	4.46	1.50						
C3H6				1.92	.25	10.50	.30	12.63	1.11	1.11	1.23	1.41	1.78	.30	.90	8.04	1.80			11.37	6.25	1.82	
C3H8				.33	.04	1.76	.05	2.12	.19	.19	.21	.24	.30	.05	.15	1.34	.40						
C4H8				.94	.12	6.72	.14	8.08	.54	.54	.60	.68	.86	.14	.56	5.00	1.12			7.68	6.10	1.26	
C4H10				.20	.03	1.74	.04	2.09	.12	.12	.13	.16	.20	.04	.16	1.43	.40			2.09	4.86	.43	
C5H10				.42	.06	4.20	.07	5.05	.24	.24	.27	.31	.39	.07	.35	3.12	.70			5.05	5.40	.94	
C6H12				.20	.03	2.52	.04	3.03	.12	.12	.13	.16	.20	.04	.24	2.14	.48			3.03	5.50	.55	
OIL								(25.90)				.19	.24		1.85	16.52	3.70			25.90	6.50	3.98	
WATER												5.06	6.40				4.44		(2.22) 5.06				
TOTAL		32.19	406.72		13.19	237.7	15.86	285.90	57.94	90.12	100.0	79.04	99.97	16.33		99.99				55.12		8.98	
H2+CO		30.58			6.96		8.37																
H2/CO		1.73			5.76		5.75			2.89		5.75											

ULTIMATE YIELDS	% C0 Fed	#/hr	H2 / C0 #/MCF	H2 / C0 g/M3	Gal/hr	H2 / C0 Gal/MCF	H2 / C0 cc/M3
C1+C2	29.46	35.38	2.90	49.04			
C3+	37.59	58.90	4.83	81.68			
C4+	28.21	44.15	3.62	61.21			
Ult. Oil		55.12	4.52	76.43	8.98	0.74	104.56
C02	21.87	107.81	8.84	149.48			
H20		91.08	7.47	126.32			

WEIGHT BALANCE	#/hr	%	#/hr
Wet Gas	237.7		285.7
Oil	40.9		40.9
Water	80.1		80.1
Total	358.7	88.2	406.7

EFFLUENT RATIOS	
H2/H20	6.56
C02/C0	2.45
(H2) (C02) / (H20) (C0)	16.04

CONTRACTION: 50.7

C0 Conversion: 88.9

H2 Conversion: 63.2

$H_2 + CO = 72.6$

Yield Calculations assume "oil" is CH2, and is found by difference on Carbon, and H20 by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at O C. and 14.7 psig. g/M3 = 16.91 × #/MCF. cc/M3 = 141.3 × gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 41 C From 6/2/48 Hr. 0800 to 6/3/48 Hr. 0700

FLOWS	SCFH	%
Oxygen	2570	
Nat. Gas	4230	
Total	6800	37.8
Fresh Feed	11900	
F. F. by C		
Avg. F. F.		
Wet Gas	4800	
Contraction		57.1
Recycle	16980	
Bleed	3452	
Total	20432	
Total Feed	32332	
Recycle/F.F.	1.72	
Inlet Vel.		
Steam Flow		

RUN CONDITIONS	
Generator Press.	270
O_2 Preheat, °F	465
Gas Preheat, °F	746
Reactor Press.	250
Steam Back Press.	
Temperatures, °F	
Heater Outlet	
Catalyst #1	630
#2	645
#3	670
#4	640
#5	
Average	
Product Separator	

DISTILLATIONS	A S T M		Hempel Dist.		
Prod.	Raw Oil	Gaso-line	°F	%	A.P.I.
A.P.I.	47.7		to 400	75.6	54.4
I.B.P.		114	400-550	13.6	34.8
5%			550+	10.8	
10%		152			
20		174			
30		194	WATER		
40		214	Temp.	%	
50		234	200		
60		254	203		
70		274	208		
80		304	A.P.I.	10.4	
90		342			
95		374			
E.P.		404			
Rec.		99.0			
Res.		1.0			
Loss					

CATALYST DATA	
In Reactor at Start of Period	694
Fresh Catalyst Charged	
Catalyst Recharged	76
Total	770
Catalyst Taken Out	51
In Reactor at End of Period	719
Reactor d-P, H_2O	
Pounds in Reactor	
Density, lbs./cu. ft.	
Bed Height, Feet	
Space Vel. SCFH/lb. cat.	
Inventory Figures	45.0
From d-P Meters	

CATALYST ANALYSIS	Particle Size				
	Screen			Sedimentation	
	Frac.	M	%	M	%
	On 40	420+	22.1	80+	
	100	419-150	40.2	80-40	
	150	149-105	6.4	40-20	
	200	104-74	6.6	20-10	
	250	73-62	2.3	10-0	
	325	61-44	7.3		
	<325	43-0	15.1		
	Density, lbs./cu. ft			Chem. Anal.	
	Aerated	179.0		% Fe	
	Settled	180.0		% C	
	Compacted	182.0		% Oil	
	Sp. Grav.	4.5		Specific Surface	
				14.2	m^2 gm

NATURAL GAS	%
CO_2	1.47
CH_4	85.71
C_2H_6	9.20
C_3H_8	3.43
C_4H_{10}	.20
N_2	
O_2	

PRODUCT INSPECTION					
	Oil	Water	Product	Pour °F	SUS @ °F
Neut. No.	39.2	39.2			
Sap. No.	42.2	38.3			
Hydrox No.	66.2				
Bromine No.	71.7				
% Fe					
% Alc		8.9			

GENERATOR ELEMENTAL BALANCE

IN	Mol %	SCFH m/hr	C	H	O
O_2	216.96	6.78			13.56
CO_2	7.04	.16	.16		.32
CH_4	153.12	9.57	9.57	38.28	
C_2H_6	30.90	1.03	2.06	6.18	
C_3H_8	16.72	.38	1.14	3.04	
C_4H_{10}	1.16	.02	.08	.20	
N_2					
Total		17.94	13.01	47.70	13.88

OUT	Mol %	SCFH m/hr	C	H	O
CO_2	1.7	.53	.53		1.06
CO	31.8	9.99	9.99		9.99
CH_4	5.2	1.63	1.63	6.52	
H_2	58.7	18.43		36.86	
N_2	2.6	.82			
H_2O				5.66	2.83
Total		31.40	12.15	49.04	13.88

	FRESH FEED			WET GAS					RECYCLE	COMB. FEED		EFFLUENT		NET CHANGE ON REACTION								
					Measured		At Wt. Balance							Carbon			Hydrogen		Oxygen	Ultimate Oil			Unsats.
	%	m/hr	#/hr	%	m/hr	#/hr	m/hr	#/hr	m/hr	m/hr	%	m/hr	%	m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%
CO	31.8	9.99	279.72	9.52	1.21	33.88	1.29	36.08	5.14	15.13	17.71	6.43	8.87	- 8.70	- 8.70	12.91			- 8.70				
H2	58.7	18.43	36.86	45.21	5.72	11.44	6.09	12.18	24.42	42.85	50.16	30.51	42.08	-12.34			-24.68						
CO2	1.7	.53	23.32	18.70	2.37	104.28	2.52	111.05	10.10	10.63	12.44	12.62	17.41	1.99	1.99				3.98				
N2	2.6	.82	22.96	1.03	.13	3.64	.14	3.88	.56	1.38	1.62	.70	.97	.68									
CH4	5.2	1.63	26.08	18.08	2.29	36.64	2.44	39.02	9.77	11.40	13.34	12.21	16.84	.81	.81	8.11	3.24						
C2H4				1.72	.22	6.16	.23	6.56	.93	.93	1.09	1.16	1.60	.23	.46	4.60	.92						
C2H6				1.03	.13	3.90	.14	4.15	.56	.56	.66	.70	.97	.14	.28	2.80	.84						
C3H6				1.77	.22	9.24	.23	9.84	.96	.96	1.12	1.19	1.64	.23	.69	6.90	1.38			8.86	6.25	1.42	
C3H8				.32	.04	1.76	.04	1.87	.17	.17	.20	.21	.29	.04	.12	1.20	.32						
C4H8				1.57	.20	11.20	.21	11.93	.85	.85	.99	1.06	1.46	.21	.84	8.40	1.68			11.33	6.10	1.86	
C4H10				.20	.03	1.74	.03	1.85	.11	.11	.13	.14	.19	.03	.12	1.20	.30			1.85	4.86	.38	
C5H10				.59	.07	4.90	.07	5.22	.32	.32	.37	.39	.54	.07	.35	3.50	.70			5.22	5.40	.97	
C6H12				.25	.03	2.52	.03	2.68	.14	.14	.16	.17	.23	.03	.18	1.80	.36			2.68	5.50	.49	
OIL								(40.04)				.29	.40		2.86	28.63	5.72			40.04	6.50	6.16	
WATER												4.72	6.51				9.22		(4.61) 4.72				
TOTAL		31.40	388.94		12.66	231.3	13.46	246.31	54.01	85.43	99.99	72.50	100.00	17.94		99.97				69.98		11.28	
H2+CO		28.42			6.93		7.38																
H2/CO		1.84			4.73		4.72			2.83		4.74											

ULTIMATE YIELDS	% C0 Fed	#/hr	H2 / C0 #/MCF	H2 / C0 g/M3	Gal/hr	H2 / C0 Gal/MCF	H2 / C0 cc/M3
C1+C2	15.51	23.65	1.99	33.65			
C3+	51.63	73.43	6.17	104.33			
C4+	43.53	61.72	5.19	87.76			
Ult. Oil		69.98	5.88	99.43	11.28	0.95	134.24
C02	19.92	87.73	7.37	123.63			
H20		84.96	7.14	120.74			

WEIGHT BALANCE	#/hr	%	#/hr
Wet Gas	231.3		246.0
Oil	58.0		58.0
Water	84.0		84.0
Total	373.3	95.8	388.9

EFFLUENT RATIOS	
H2/H20	6.46
C02/C0	1.96
(H2) (C02) / (H20) (C0)	12.69

CONTRACTION:	57.1
C0 Conversion:	87.1
H2 Conversion:	66.9
Hg+C0 =	74.0

Yield Calculations assume "oil" is CH2, and is found by difference on Carbon, and H20 by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at 0 C. and 14.7 psig. g/M3 = 16.91 × #/MCF. cc/M3 = 141.3 × gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 41 D From 6/3/48 Hr. 0800 to 6/4/48 Hr. 0700

FLOWS	SCFH	%
Oxygen	2500	
Nat. Gas	4200	
Total	6700	37.3
Fresh Feed	11700	
F. F. by C		
Avg. F. F.		
Wet Gas	4600	
Contraction		49.6
Recycle	16560	
Bleed	5589	
Total	22149	
Total Feed	33849	
Recycle/F.F.	1.89	
Inlet Vel.		
Steam Flow		

RUN CONDITIONS	
Generator Press.	274
O_2 Preheat, °F	450
Gas Preheat, °F	665
Reactor Press.	250
Steam Back Press.	
Temperatures, °F	
Heater Outlet	
Catalyst #1	640
#2	650
#3	675
#4	640
#5	
Average	
Product Separator	

DISTILLATIONS	A S T M	
Prod.	Ray Oil	Gasoline
A.P.I.	43.8	
I.B.P.		110
5%		
10%		156
20		182
30		208
40		232
50		250
60		274
70		296
80		324
90		362
95		392
E.P.		414
Rec.		97.0
Res.		2.0
Loss.		1.0

Hempel Dist.	°F	%	A.P.I.
to 400		72.0	51.4
400-550		16.6	32.6
550+			

WATER	Temp.	%
	200	
	203	
	208	
	A.P.I.	

CATALYST DATA	
In Reactor at Start of Period	719
Fresh Catalyst Charged	78
Catalyst Recharged	
Total	797
Catalyst Taken Out	72.75
In Reactor at End of Period	724.25
Reactor d-P, H_2O	
Pounds in Reactor	
Density, lbs./cu. ft.	
Bed Height, Feet	
Space Vel. SCFH/lb. cat.	
Inventory Figures	46.8
From d-P Meters	

CATALYST ANALYSIS	Particle Size				
	Screen			Sedimentation	
	Frac.	M	%	M	%
	On 40	420+	29.3	80+	
	100	419-150	37.2	80-40	
	150	149-105	4.9	40-20	
	200	104-74	5.1	20-10	
	250	73-62	1.6	10-0	
	325	61-44	5.1		
	<325	43-0	16.8		
	Density, lbs./cu. ft			Chem. Anal.	
	Aerated			% Fe	
	Settled			% C	
	Compacted			% Oil	
	Sp. Grav. 4.9			Specific Surface	
				17.3	m^2 gm

NATURAL GAS	%
CO_2	1.41
CH_4	84.98
C_2H_6	9.46
C_3H_8	3.95
C_4H_{10}	.20
N_2	
O_2	

PRODUCT INSPECTION					
	Oil	Water	Product	Pour °F	SUS @ °F
Neut. No.	51.0				
Sap. No.	53.3				
Hydrox. No.	65.2				
Bromine No.	62.1				
% Fe					
% Alc					

GENERATOR ELEMENTAL BALANCE

IN	Mol %	SCFH m/hr	C	H	O
O_2	211.20	6.60			13.20
CO_2	7.04	.16	.16		.32
CH_4	150.72	9.42	9.42	37.68	
C_2H_6	31.50	1.05	2.10	6.30	
C_3H_8	19.36	.44	1.32	3.52	
C_4H_{10}	1.16	.02	.08	.20	
N_2					
Total		17.69	13.08	47.70	13.52

OUT	Mol %	SCFH m/hr	C	H	O
CO_2	2.6	.80	.80		1.60
CO	33.6	10.37	10.37		10.37
CH_4	6.0	1.85	1.85	7.40	
H_2	56.6	17.47		34.94	
N_2	1.2	.37			
H_2O				3.10	1.55
Total		30.86	13.02	45.44	13.52

	FRESH FEED			WET GAS					RECYCLE	COMB. FEED		EFFLUENT		NET CHANGE ON REACTION								
					Measured		At Wt. Balance							Carbon			Hydrogen		Oxygen	Ultimate Oil			Unsats.
	%	m/hr	#/hr	%	m/hr	#/hr	m/hr	#/hr	m/hr	m/hr	%	m/hr	%	m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%
CO	33.6	10.37	290.36	10.18	1.24	34.72	1.59	44.42	5.94	16.31	18.29	7.53	9.56	- 8.78	- 8.78	15.33			- 8.78				
H2	56.6	17.47	34.94	43.58	5.29	10.58	6.77	13.53	25.42	42.89	48.09	32.19	40.87	-10.70			-21.40						
CO2	2.6	.80	35.20	18.33	2.23	98.12	2.85	125.52	10.69	11.49	12.88	13.54	17.19	2.05	2.05	19.77			4.10				
N2	1.2	.37	10.36	.47	.06	1.68	.08	2.15	.27	.64	.72	.35	.44	- .29									
CH4	6.0	1.85	29.60	20.01	2.34	38.98	3.11	49.74	11.67	13.52	15.16	14.78	18.77	1.26	1.26	12.15	5.04						
C2H4				1.87	.23	6.44	.29	8.24	1.09	1.09	1.22	1.38	1.75	.29	.58	5.59	1.16						
C2H6				1.19	.14	4.20	.18	5.37	.69	.69	.77	.87	1.10	.18	.36	3.47	1.08						
C3H6				1.90	.23	9.66	.29	12.36	1.11	1.11	1.24	1.40	1.78	.29	.87	8.39	1.40			11.12	6.25	1.78	
C3H8				.26	.03	1.32	.04	1.69	.15	.15	.17	.19	.24	.04	.12	1.16	.32						
C4H8				1.19	.14	7.84	.18	10.03	.69	.69	.77	.87	1.10	.18	.72	6.94	1.44			9.53	6.10	1.56	
C4H10				.24	.03	1.74	.04	2.23	.14	.14	.16	.18	.23	.04	.16	1.54	.40			2.23	4.86	.46	
C5H10				.55	.07	4.90	.09	6.27	.32	.32	.36	.41	.52	.09	.45	4.34	.90			6.27	5.40	1.16	
C6H12				.24	.03	2.52	.04	3.22	.14	.14	.16	.18	.23	.04	.24	2.31	.48			3.22	5.50	.59	
OIL								(27.58)				.20	.25		1.97	19.00	3.94			27.58	6.50	4.24	
WATER												4.68	5.94				4.90		(2.45) 4.68				
TOTAL		30.87	400.46		12.14	222.6	15.55	284.77	58.34	89.18	99.99	78.75	99.97	15.31		99.99				59.95		9.79	
H2+CO		27.84			6.53		8.36																
H2/CO		1.68			4.27		4.26			2.63		4.27											

ULTIMATE YIELDS	% C0 Fed	#/hr	H2/C0 #/MCF	H2/C0 g/M3	Gal/hr	H2/C0 Gal/MCF	H2/C0 cc/M3
C1+C2	21.21	33.75	2.88	48.70			
C3+	43.68	63.38	5.42	91.65			
C4+	34.13	49.33	4.22	71.36			
Ult. Oil		59.95	5.12	86.58	9.79	0.84	118.69
C02	19.77	90.32	7.72	130.55			
H20		84.24	7.20	121.75			

WEIGHT BALANCE	#/hr	%	#/hr
Wet Gas	222.6		284.5
Oil	27.0		27.0
Water	89.0		89.0
Total	338.6	84.8	400.5

EFFLUENT RATIOS	
H2/H20	6.88
C02/C0	1.80
(H2) (C02) / (H20) (C0)	12.37

CONTRACTION: 49.6

C0 Conversion: 84.7

H2 Conversion: 61.2

H_2 + CO = 70.0

Yield Calculations assume "oil" is CH2, and is found by difference on Carbon, and H20 by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at O C. and 14.7 psig. g/M3 = 16.91 × #/MCF. cc/M3 = 141.3 × gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 42 A From 6/12/48 Hr. 0800 to 6/13/48 Hr. 0700

FLOWS	SCFH	%
Oxygen	2790	
Nat. Gas	4230	
Total	7020	39.7
Fresh Feed	12600	
F. F. by C	13416	
Avg. F. F.		
Wet Gas	3270	
Contraction		56.8
Recycle	18540	
Bleed	6842	
Total	25382	
Total Feed	37982	
Recycle/F.F.	2.01	
Inlet Vel.		
Steam Flow		

RUN CONDITIONS	
Generator Press.	274
O_2 Preheat, °F	470
Gas Preheat, °F	780
Reactor Press.	250
Steam Back Press.	
Temperatures, °F	
Heater Outlet	
Catalyst #1	615
#2	650
#3	660
#4	604
#5	
Average	
Product Separator	

DISTILLATIONS										
	A S T M						Hempel Dist.			
Prod.	Raw Oil	Gasoline					°F	%	A.P.I.	
A.P.I.	44.5						to 400	67.6	53.8	
I.B.P.		110					400-550	19.0	33.5	
5%							550+			
10%		148								
20		176								
30		202					WATER			
40		224					Temp.	%		
50		244					200			
60		264					203			
70		288					208			
80		314					A.P.I.	10.3		
90		340								
95		378								
E.P.		400								
Rec.		98.0								
Res.		1.0								
Loss		1.0								

CATALYST DATA	
In Reactor at Start of Period	779.0
Fresh Catalyst Charged	
Catalyst Recharged	
Total	779.0
Catalyst Taken Out	78.0
In Reactor at End of Period	701.0
Reactor d-P, H_2O	
Pounds in Reactor	
Density, lbs./cu. ft.	
Bed Height, Feet	
Space Vel. SCFH/lb. cat.	
Inventory Figures	54.2
From d-P Meters	

CATALYST ANALYSIS				
Particle Size				
Screen			Sedimentation	
Frac.	M	%	M	%
On 40	420+	19.2	80+	
100	419-150	30.6	80-40	
150	149-105	8.3	40-20	
200	104-74	9.7	20-10	
250	73-62	8.1	10-0	
325	61-44	7.5		
<325	43-0	16.6		
Density, lbs./cu. ft.			Chem. Anal.	
Aerated	180.0		% Fe	
Settled	179.7		% C	
Compacted	224.0		% Oil	
Sp. Grav.	5.0		Specific Surface	
			10.9	m^2/gm

NATURAL GAS	%
CO_2	1.21
CH_4	85.66
C_2H_6	8.98
C_3H_8	3.89
C_4H_{10}	.25
N_2	
O_2	

PRODUCT INSPECTION					
	Oil	Water	Product	Pour °F	SUS @ °F
Neut. No.	43.4	32.5			
Sap. No.	44.1	31.6			
Hydrox. No.	28.6				
Bromine No.	61.2				
% Fe					
% Alc		6.7			

GENERATOR ELEMENTAL BALANCE

IN	Mol %	SCFH m/hr	C	H	O
O_2	235.52	7.36			14.72
CO_2	6.16	.14	.14		.28
CH_4	152.96	9.56	9.56	38.24	
C_2H_6	30.00	1.00	2.00	6.00	
C_3H_8	18.92	.43	1.29	3.44	
C_4H_{10}	1.74	.03	.12	.30	
N_2					
Total		18.52	13.11	47.98	15.00

OUT	Mol %	SCFH m/hr	C	H	O
CO_2	1.7	.57	.57		1.14
CO	34.1	11.34	11.34		11.34
CH_4	4.4	1.46	1.46	5.84	
H_2	59.8	19.88		39.76	
N_2					
H_2O				5.04	2.52
Total		33.25	13.37	50.64	15.00

	FRESH FEED			WET GAS					RECYCLE	COMB. FEED		EFFLUENT		NET CHANGE ON REACTION									
					Measured		At Wt. Balance							Carbon			Hydrogen		Oxygen	Ultimate Oil			Unsats.
	%	m/hr	#/hr	%	m/hr	#/hr	m/hr	#/hr	m/hr	m/hr	%	m/hr	%	m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%
CO	34.1	11.34	317.52	4.73	.41	11.48	.68	19.14	3.16	14.50	14.49	3.84	4.34	-10.66	-10.66	5.99			-10.66				
H2	59.8	19.88	39.76	48.59	4.19	8.38	6.98	13.97	32.47	52.35	52.31	39.45	44.62	-12.90			-25.80						
CO2	1.7	.57	25.08	17.31	1.49	65.56	2.48	109.29	11.57	12.14	12.13	14.05	15.89	1.91	1.91	16.84			3.82				
N2	-	-	-	1.51	.13	3.64	.22	6.07	1.01	1.01	1.01	1.23	1.39	.22									
CH4	4.4	1.46	23.36	19.54	1.69	27.04	2.82	45.08	13.06	14.52	14.51	15.88	17.96	1.36	1.36	11.99	5.44						
C2H4				1.65	.14	3.92	.23	6.53	1.10	1.10	1.10	1.33	1.50	.23	.46	4.06	.92						
C2H6				1.70	.15	4.50	.25	7.50	1.14	1.14	1.14	1.39	1.57	.25	.50	4.41	1.50						
C3H6				2.00	.17	7.14	.28	11.90	1.34	1.34	1.34	1.62	1.83	.28	.84	7.41	1.68			10.71	6.25	1.71	
C3H8				.51	.04	1.76	.07	2.93	.34	.34	.34	.41	.46	.07	.21	1.85	.56						
C4H8				1.32	.11	6.16	.18	10.27	.88	.88	.88	1.06	1.20	.18	.72	6.35	1.44			9.76	6.10	1.60	
C4H10				.30	.03	1.74	.05	2.90	.20	.20	.20	.25	.28	.05	.20	1.76	.50			2.90	4.86	.60	
C5H10				.62	.05	3.50	.08	5.83	.41	.41	.41	.49	.55	.08	.40	3.53	.80			5.83	5.40	1.08	
C6H12				.22	.02	1.68	.03	2.80	.15	.15	.15	.18	.20	.03	.18	1.59	.36			2.80	5.50	.51	
OIL								(54.32)				.39	.44		3.88	34.22	7.76			54.32	6.50	8.36	
WATER												6.84	7774				4.84		(2.42) 6.84				
TOTAL		33.25	405.72		8.63	146.50	14.35	244.21	66.83	100.08	100.01	88.41	99.97	18.90		100.00				86.32		13.86	
H2+CO		31.22			4.60		7.66																
H2/CO		1.75			10.22		10.26			3.61		10.27											

ULTIMATE YIELDS	% C0 Fed	#/hr	H2 / C0 #/MCF	H2 / C0 g/M3	Gal/hr	H2 / C0 Gal/MCF	H2 / C0 cc/M3
C1+C2	20.46	35.75	3.02	51.07			
C3+	51.15	90.95	7.69	130.04			
C4+	47.45	76.12	6.43	108.73			
Ult. Oil		86.32	7.30	123.44	13.86	1.17	165.32
C02	16.84	84.21	7.12	120.40			
H20		123.12	10.41	176.03			

WEIGHT BALANCE	#/hr	%	#/hr
Wet Gas	146.5		244.2
Oil	49.2		49.2
Water	112.3		112.3
Total	308.0	76.0	405.7

EFFLUENT RATIOS	
H2/H20	5.77
C02/C0	3.66
(H2) (C02) / (H20) (C0)	21.10

CONTRACTION: 56.8

C0 Conversion: 94.0

H2 Conversion: 64.9

$H_2 + CO = 75.3$

Yield Calculations assume "oil" is CH2, and is found by difference on Carbon, and H20 by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at O C. and 14.7 psig. g/M3 = 16.91 × #/MCF. cc/M3 = 141.3 × gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 42 B From 6/13/48 Hr. 0800 to 6/14/48 Hr. 0700

FLOWS	SCFH	%
Oxygen	2800	
Nat. Gas	4280	
Total	7080	39.5
Fresh Feed	12300	
F. F. by C	12500	
Avg. F. F.		
Wet Gas	3880	
Contraction		58.9
Recycle	17490	
Bleed	5797	
Total	23287	
Total Feed	35587	
Recycle/F.F.	1.89	
Inlet Vel.		
Steam Flow		

RUN CONDITIONS	
Generator Press.	276
O_2 Preheat, °F	490
Gas Preheat, °F	775
Reactor Press.	250
Steam Back Press.	
Temperatures, °F	
Heater Outlet	
Catalyst #1	630
#2	655
#3	660
#4	605
#5	
Average	
Product Separator	

DISTILLATIONS								
	A S T M				Hempel Dist.			
Prod.	Raw Oil	Gasoline			°F	%	A.P.I.	
A.P.I.	45.6				to 400	71.3	53.4	
I.B.P.		112			400-550	15.3	33.6	
5%					550+			
10%		146						
20		166						
30		198			WATER			
40		218			Temp.	%		
50		238			200			
60		258			203			
70		280			208			
80		314			A.P.I.	10.2		
90		346						
95		362						
E.P.		396						
Rec.		98.0						
Res.		1.0						
Loss.		1.0						

CATALYST DATA	
In Reactor at Start of Period	701.0
Fresh Catalyst Charged	120.0
Catalyst Recharged	
Total	821.0
Catalyst Taken Out	79.0
In Reactor at End of Period	742.0
Reactor d-P, H_2O	
Pounds in Reactor	
Density, lbs./cu. ft.	
Bed Height, Feet	
Space Vel. SCFH/lb. cat.	
Inventory Figures	48.0
From d-P Meters	

CATALYST ANALYSIS					
Particle Size					
Screen			Sedimentation		
Frac.	M	%	M	%	
On 40	420+	7.0	80+		
100	419-150	23.9	80-40		
150	149-105	8.4	40-20		
200	104-74	11.0	20-10		
250	73-62	5.6	10-0		
325	61-44	22.5			
<325	43-0	21.5			
Density, lbs./cu. ft			Chem. Anal.		
Aerated	180.0		% Fe		
Settled	183.0		% C		
Compacted	197.0		% Oil		
Sp. Grav.	4.7		Specific Surface		
			9.9	m^2 gm	

NATURAL GAS	
	%
CO_2	1.40
CH_4	86.27
C_2H_6	9.05
C_3H_8	2.94
C_4H_{10}	.17
N_2	.17
O_2	

PRODUCT INSPECTION					
	Oil	Water	Product	Pour °F	SUS @ °F
Neut. No.	49.2	38.9			
Sap. No.	51.1	31.0			
Hydrox No.	54.1				
Bromine No.	61.6				
% Fe					
% Alc		8.4			

GENERATOR ELEMENTAL BALANCE

IN						OUT					
	Mol %	SCFH m/hr	C	H	O		Mol %	SCFH m/hr	C	H	O
O_2	236.48	7.39			14.78	CO_2	2.4	.76	.76		1.56
CO_2	7.04	.16	.16		.32	CO	34.8	11.29	11.29		11.29
CH_4	155.84	9.74	9.74	38.96		CH_4	2.9	.94	.94	3.76	
C_2H_6	30.60	1.02	2.04	6.12		H_2	59.7	19.37		38.74	
C_3H_8	14.52	.33	.99	2.64		N_2	0.2	.06			
C_4H_{10}	1.16	.02	.08	.20		H_2O				4.50	2.25
N_2	.56	.02				Total		32.44	13.01	46.90	15.10
Total		18.68	13.01	47.92	15.10						

	FRESH FEED			WET GAS					RECYCLE	COMB. FEED		EFFLUENT		NET CHANGE ON REACTION									
					Measured		At Wt. Balance							Carbon			Hydrogen		Oxygen	Ultimate Oil			Unsats.
	%	m/hr	#/hr	%	m/hr	#/hr	m/hr	#/hr	m/hr	m/hr	%	m/hr	%	m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%
CO	34.8	11.29	316.12	8.99	.92	25.76	1.20	33.48	5.51	16.80	17.92	6.71	8.27	-10.09	-10.09	10.63			-10.09				
H2	59.7	19.37	38.74	44.04	4.51	9.02	5.86	11.72	27.01	46.38	49.47	32.87	40.53	-13.51			-27.02						
CO2	2.4	.78	34.32	20.66	2.12	93.28	2.75	121.22	12.67	13.45	14.35	15.42	19.01	1.97	1.97	17.45			3.94				
N2	0.2	.06	1.68	.62	.06	1.68	.08	2.18	.38	.42	.45	.46	.57	.02									
CH4	2.9	.94	15.04	16.50	1.69	27.04	2.20	35.14	10.12	11.06	11.80	12.32	15.19	1.26	1.26	11.16	5.04						
C2H4				2.25	.23	6.44	.30	8.37	1.38	1.38	1.47	1.68	2.07	.30	.60	5.31	1.20						
C2H6				1.50	.15	4.50	.19	5.85	.92	.92	.98	1.11	1.37	.19	.38	3.37	1.14						
C3H6				2.41	.25	10.50	.32	13.64	1.48	1.48	1.58	1.80	2.22	.32	.96	8.50	1.92			12.28	6.25	1.96	
C3H8				.11	.01	.44	.01	.57	.07	.07	.07	.08	.10	.01	.03	.27	.08						
C4H8				1.37	.14	7.84	.18	10.19	.84	.84	.90	1.02	1.26	.18	.72	6.38	1.44			9.68	6.10	1.59	
C4H10				.59	.06	3.48	.08	4.52	.36	.36	.38	.44	.54	.08	.32	2.83	.80			4.52	4.86	.93	
C5H10				.64	.07	4.90	.09	6.37	.39	.39	.42	.48	.59	.09	.45	3.99	.90			6.37	5.40	1.18	
C6H12				.32	.03	2.52	.04	3.27	.20	.20	.21	.24	.30	.04	.24	2.13	.48			3.27	5.50	.59	
OIL								(44.24)				.32	.39		3.16	27.99	6.32			44.24	6.50	6.81	
WATER												6.15	7.58				7.70		(3.85) 6.15				
TOTAL		32.45	405.90		10.24	197.40	13.30	256.52	61.33	93.75	100.00	81.10	99.99	19.14		100.01				80.36		13.06	
H2+CO		30.66			5.43		7.06																
H2/CO		1.72			4.90		4.88			2.76		4.90											

ULTIMATE YIELDS							
	% C0 Fed	#/hr	H2 / C0 #/MCF	g/M3	Gal/hr	H2 / C0 Gal/MCF	cc/M3
C1+C2	19.84	49.36	4.25	71.87			
C3+	52.09	82.80	7.13	120.57			
C4+	43.32	68.59	5.90	99.77			
Ult. Oil		80.36	6.92	117.02	13.06	1.12	158.26
C02	17.45	86.90	7.48	126.49			
H20		110.70	9.53	161.15			

WEIGHT BALANCE	#/hr	%	#/hr
Wet Gas	197.4		256.9
Oil	42.0		42.0
Water	107.0		107.0
Total	346.4	85.4	405.9

EFFLUENT RATIOS	
H2/H20	5.34
C02/C0	2.30
(H2) (C02) / (H20) (C0)	12.28

CONTRACTION: 58.9

C0 Conversion: 89.4

H2 Conversion: 69.7

$H_2 + CO = 76.9$

Yield Calculations assume "oil" is CH2, and is found by difference on Carbon, and H20 by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at O C. and 14.7 psig. g/M3 = 16.91 × #/MCF. cc/M3 = 141.3 × gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 42 C From 6/14/48 Hr. 0800 to 6/15/48 Hr. 0700

FLOWS	SCFH	%
Oxygen	2820	
Nat. Gas	4200	
Total	7020	40.2
Fresh Feed	12350	
F. F. by C	12700	
Avg. F. F.		
Wet Gas	4300	
Contraction		58.2
Recycle	17880	
Bleed	5520	
Total	23050	
Total Feed	35400	
Recycle/F.F.	1.87	
Inlet Vel.		
Steam Flow		

RUN CONDITIONS	
Generator Press.	278
O_2 Preheat, °F	445
Gas Preheat, °F	770
Reactor Press.	250
Steam Back Press.	
Temperatures, °F	
Heater Outlet	
Catalyst #1	650
#2	660
#3	665
#4	640
#5	
Average	
Product Separator	

DISTILLATIONS								
	ASTM				Hempel Dist.			
Prod.	Raw Oil	Gasoline			°F	%	A.P.I.	
A.P.I.	44.7				to 400	72.3	52.1	
I.B.P.		113			400-550	21.6	33.7	
5%					550+	5.1		
10%		154						
20		180						
30		206			WATER			
40		226			Temp.	%		
50		246			200			
60		264			203			
70		292			208			
80		320			A.P.I.	10.3		
90		343						
95		384						
E.P.		402						
Rec.		98.0						
Res.		1.0						
Loss		1.0						

CATALYST DATA	
In Reactor at Start of Period	742.0
Fresh Catalyst Charged	
Catalyst Recharged	
Total	742.0
Catalyst Taken Out	80.0
In Reactor at End of Period	662.0
Reactor d-P, H_2O	
Pounds in Reactor	
Density, lbs./cu. ft.	
Bed Height, Feet	
Space Vel. SCFH/lb. cat.	
Inventory Figures	53.5
From d-P Meters	

CATALYST ANALYSIS					
Particle Size					
Screen			Sedimentation		
Frac.	M	%	M	%	
On 40	420+	14.4	80+		
100	419-150	44.6	80-40		
150	149-105	7.4	40-20		
200	104-74	9.6	20-10		
250	73-62	3.4	10-0		
325	61-44	8.8			
<325	43-0	11.8			
Density, lbs./cu. ft			Chem. Anal.		
Aerated			% Fe		
Settled			% C		
Compacted			% Oil		
Sp. Grav. 4.5			Specific Surface		
			14.9		m^2 gm

NATURAL GAS	%
CO_2	1.31
CH_4	84.11
C_2H_6	9.70
C_3H_8	4.80
C_4H_{10}	.09
N_2	
O_2	

PRODUCT INSPECTION					
	Oil	Water	Product	Pour °F	SUS @ °F
Neut. No.	51.5	40.9			
Sap. No.	54.4	38.6			
Hydrox. No.	54.1				
Bromine No.	65.7				
% Fe					
% Alc		8.7			

GENERATOR ELEMENTAL BALANCE

IN	Mol %	SCFH m/hr	C	H	O
O_2	238.08	7.44			14.88
CO_2	6.60	.15	.15		.30
CH_4	149.12	9.32	9.32	37.28	
C_2H_6	32.10	1.07	2.14	6.42	
C_3H_8	23.32	.53	1.59	4.24	
C_4H_{10}	.58	.01	.04	.10	
N_2					
Total		18.52	13.24	48.04	15.18

OUT	Mol %	SCFH m/hr	C	H	O
CO_2	2.1	.68	.68		1.36
CO	34.1	11.11	11.11		11.11
CH_4	2.9	.95	.95	3.70	
H_2	60.1	19.59		39.18	
N_2	0.8	.26			
H_2O				4.42	2.71
Total		32.59	12.74	47.30	15.18

STRATCO REACTOR

	FRESH FEED			WET GAS					RECYCLE	COMB. FEED		EFFLUENT		NET CHANGE ON REACTION								
					Measured		At Wt. Balance							Carbon			Hydrogen		Oxygen	Ultimate Oil			Unsats.
	%	m/hr	#/hr	%	m/hr	#/hr	m/hr	#/hr	m/hr	m/hr	%	m/hr	%	m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%
CO	34.1	11.11	311.08	10.91	1.24	34.72	1.49	41.66	6.65	17.76	18.99	8.14	10.19	- 9.62	- 9.62	13.41			- 9.62				
H2	60.1	19.59	39.18	43.40	4.93	9.86	5.92	11.83	26.45	46.04	49.22	32.37	40.52	-13.67			-27.34						
CO2	2.1	.68	29.92	22.38	2.54	111.76	3.05	134.11	13.64	14.32	15.31	16.69	20.89	2.37	2.37	21.33			4.74				
N2	0.8	.26	7.28	.18	.02	.56	.02	.67	.11	.37	.40	.13	.16	- .24									
CH4	2.9	.95	15.20	14.51	1.65	26.40	1.98	31.68	8.84	9.79	10.47	10.82	13.54	1.03	1.03	9.27	4.12						
C2H4				1.93	.22	6.16	.26	7.39	1.18	1.18	1.26	1.44	1.80	.26	.52	4.68	1.04						
C2H6				1.25	.14	4.20	.17	5.04	.76	.76	.81	.93	1.16	.17	.28	2.52	1.02						
C3H6				1.84	.21	8.82	.25	10.58	1.12	1.12	1.20	1.37	1.71	.25	.75	6.75	1.50			9.52	6.25	1.52	
C3H8				.15	.02	.88	.02	1.06	.09	.09	.10	.11	.14	.02	.06	.54	.16						
C4H8				1.46	.17	9.52	.20	11.42	.89	.89	.95	1.09	1.36	.20	.80	7.20	1.60			10.85	6.10	1.78	
C4H10				.92	.10	5.80	.12	6.96	.56	.56	.60	.68	.85	.12	.48	4.32	1.20			6.96	4.86	1.43	
C5H10				.74	.08	5.60	.10	6.72	.45	.45	.48	.55	.69	.10	.50	4.50	1.00			6.72	5.40	1.24	
C6H12				.33	.04	3.36	.05	4.03	.20	.20	.21	.25	.31	.05	.30	2.70	.60			4.03	5.50	.73	
OIL								(35.42)				.25	.31		2.53	22.77	5.06			35.42	6.50	5.45	
WATER												5.06	6.33				10.04		(5.02) 4.88				
TOTAL		32.59	402.66		11.35	227.64	13.63	273.15	60.94	93.53	100.0	79.88	99.99	18.96		99.99				73.50		12.15	
H2+CO		30.70			6.17		7.41																
H2/CO		1.76			3.98		3.97			2.59		3.98											

ULTIMATE YIELDS	% C0 Fed	#/hr	H2 / C0 #/MCF	H2 / C0 g/M3	Gal/hr	H2 / C0 Gal/MCF	H2 / C0 cc/M3
C1+C2	16.47	28.91	2.34	39.55			
C3+	48.78	76.19	6.17	104.27			
C4+	41.49	64.55	5.23	88.39			
Ult. Oil		73.50	5.95	100.56	12.15	0.98	138.47
C02	21.33	104.19	8.44	142.64			
H20		87.84	7.11	120.16			

WEIGHT BALANCE	#/hr	%	#/hr
Wet Gas	229.6		272.3
Oil	37.2		37.2
Water	93.1		93.1
Total	357.9	88.9	402.6

EFFLUENT RATIOS	
H2/H20	6.63
C02/C0	2.05
(H2) (C02) / (H20) (C0)	13.60

CONTRACTION: 58.2

C0 Conversion: 86.6

H2 Conversion: 69.8

H_2+CO = 75.9

Yield Calculations assume "oil" is CH2, and is found by difference on Carbon, and H20 by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at O C. and 14.7 psig. g/M3 = 16.91 × #/MCF. cc/M3 = 141.3 × gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 42 D From 6/15/48 Hr. 0800 to 6/16/48 Hr. 0700

FLOWS	SCFH	%
Oxygen	2780	
Nat. Gas	4260	
Total	7040	39.5
Fresh Feed	12100	
F. F. by C	12700	
Avg. F. F.		
Wet Gas	4530	
Contraction		55.8
Recycle	17840	
Bleed	5240	
Total	23080	
Total Feed	35182	
Recycle/F.F.	1.91	
Inlet Vel.		
Steam Flow		

RUN CONDITIONS	
Generator Press.	280
O_2 Preheat, °F	465
Gas Preheat, °F	780
Reactor Press.	250
Steam Back Press.	
Temperatures, °F	
Heater Outlet	
Catalyst #1	655
#2	660
#3	665
#4	630
#5	
Average	
Product Separator	

DISTILLATIONS	A S T M	
Prod.	Raw Oil	Gasoline
A.P.I.	45.2	
I.B.P.		112
5%		
10%		146
20		182
30		206
40		225
50		246
60		264
70		290
80		317
90		350
95		378
E.P.		394
Rec.		98.0
Res.		1.0
Loss.		1.0

Hempel Dist.	%	A.P.I.
°F		
to 400	70.0	52.7
400-550	19.3	34.1
550+		

WATER	
Temp.	%
200	
203	
208	
A.P.I.	10.4

CATALYST DATA	
In Reactor at Start of Period	662.0
Fresh Catalyst Charged	
Catalyst Recharged	
Total	662.0
Catalyst Taken Out	51.5
In Reactor at End of Period	610.5
Reactor d-P, H_2O	
Pounds in Reactor	
Density, lbs./cu. ft.	
Bed Height, Feet	
Space Vel. SCFH/lb. cat.	
Inventory Figures	57.7
From d-P Meters	

CATALYST ANALYSIS	Particle Size				
	Screen			Sedimentation	
Frac.	M	%	M	%
On 40	420+	5.6	80+	
100	419-150	48.2	80-40	
150	149-105	8.4	40-20	
200	104-74	9.4	20-10	
250	73-62	6.2	10-0	
325	61-44	7.0		
<325	43-0	17.2		
Density, lbs./cu. ft			Chem. Anal.	
Aerated	153.4		% Fe	
Settled	156.0		% C	
Compacted	172.0		% Oil	
Sp. Grav.	4.2		Specific Surface	
			27.7	m^2 gm

NATURAL GAS	%
CO_2	1.60
CH_4	85.95
C_2H_6	9.00
C_3H_8	2.93
C_4H_{10}	.18
N_2	.34
O_2	

PRODUCT INSPECTION					
	Oil	Water	Product	Pour °F	SUS @ °F
Neut. No.	53.2	42.2			
Sap. No.	53.3	40.8			
Hydrox. No.	52.0				
Bromine No.	70.7				
% Fe					
% Alc		8.4			

GENERATOR ELEMENTAL BALANCE

IN	Mol %	SCFH m/hr	C	H	O
O_2	234.88	7.34			14.68
CO_2	7.92	.18	.18		.36
CH_4	154.56	9.66	9.66	38.64	
C_2H_6	30.30	1.01	2.02	6.06	
C_3H_8	14.52	.33	.99	2.64	
C_4H_{10}	1.16	.02	.08	.20	
N_2	1.12	.04			
Total		18.58	12.93	47.54	15.06

OUT	Mol %	SCFH m/hr	C	H	O
CO_2	2.2	.70	.70		1.40
CO	33.2	10.60	10.60		10.60
CH_4	2.9	.93	.93	3.72	
H_2	59.2	18.90		37.80	
N_2	2.5	.80			
H_2O				6.12	3.06
Total		31.93	12.23	47.62	15.06

	FRESH FEED			WET GAS					RECYCLE	COMB. FEED		EFFLUENT		NET CHANGE ON REACTION								
					Measured		At Wt. Balance							Carbon			Hydrogen		Oxygen	Ultimate Oil			Unsats.
	%	m/hr	#/hr	%	m/hr	#/hr	m/hr	#/hr	m/hr	m/hr	%	m/hr	%	m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%
CO	33.2	10.60	296.80	12.59	1.50	42.00	1.77	49.54	7.68	18.28	19.67	9.45	11.89	- 8.83	- 8.83	16.70			- 8.83				
H2	59.2	18.90	37.80	44.40	5.31	10.62	6.26	12.53	27.08	45.98	49.48	33.34	41.93	-12.64			-25.28						
CO2	2.2	.70	30.80	21.40	2.56	112.64	3.02	132.86	13.05	13.75	14.80	16.07	20.21	2.32	2.32	21.89			4.64				
N2	2.5	.80	22.40	.72	.09	2.52	.11	2.97	.44	1.24	1.33	.55	.69	- .69									
CH4	2.9	.93	14.88	13.05	1.56	24.96	1.84	29.44	7.96	8.89	9.57	9.80	12.33	.91	.91	8.58	3.64						
C2H4				1.80	.22	6.16	.26	7.27	1.10	1.10	1.18	1.36	1.71	.26	.52	4.91	1.04						
C2H6				1.23	.15	4.50	.18	5.31	.75	.75	.81	.93	1.17	.18	.36	3.40	1.08						
C3H6				1.84	.22	9.24	.26	10.90	1.12	1.12	1.21	1.38	1.74	.26	.78	7.36	1.56			9.81	6.25	1.57	
C3H8				.20	.02	.88	.02	1.04	.12	.12	.13	.14	.18	.02	.06	.57	.16						
C4H8				1.23	.15	8.40	.18	9.91	.75	.75	.81	.93	1.17	.18	.72	6.79	1.44			9.41	6.10	1.54	
C4H10				.53	.06	3.48	.07	4.10	.32	.32	.34	.39	.48	.07	.28	2.64	.70			4.10	4.86	.84	
C5H10				.72	.09	6.30	.11	7.43	.44	.44	.47	.55	.69	.11	.55	5.19	1.10			7.43	5.40	1.38	
C6H12				.29	.03	2.52	.04	2.97	.18	.18	.19	.22	.28	.04	.24	2.26	.48			2.97	5.50	.54	
OIL								(29.26)				.21	.26		2.09	19.72	4.18			29.26	6.50	4.50	
WATER												4.19	5.27				9.90		(4.95) 4.19				
TOTAL		31.93	402.68		11.95	234.22	14.12	276.27	60.99	92.92	99.99	79.51	100.01	17.81		100.01				62.98		10.37	
H2+CO		29.50			6.81		8.03																
H2/CO		1.78			3.54		3.54			2.52		3.53											

ULTIMATE YIELDS	% C0 Fed	#/hr	H2 / C0 #/MCF	H2 / C0 g/M3	Gal/hr	H2 / C0 Gal/MCF	H2 / C0 cc/M3
C1+C2	16.89	27.14	2.43	41.09			
C3+	44.53	65.61	5.87	99.26			
C4+	36.60	53.67	4.80	81.17			
Ult. Oil		68.98	5.63	95.20	10.37	0.93	131.41
C02	21.89	102.06	9.13	154.39			
H20		75.42	6.75	114.14			

WEIGHT BALANCE	#/hr	%	#/hr
Wet Gas	234.2		276.5
Oil	31.8		31.8
Water	94.4		94.4
Total	360.4	89.6	402.7

EFFLUENT RATIOS	
H2/H20	7.96
C02/C0	1.70
(H2) (C02) / (H20) (C0)	13.53

CONTRACTION:	55.8
C0 Conversion:	83.3
H2 Conversion:	66.9

$H_2 + CO = 72.8$

Yield Calculations assume "oil" is CH2, and is found by difference on Carbon, and H20 by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at O C. and 14.7 psig. g/M3 = 16.91 × #/MCF. cc/M3 = 141.3 × gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 42 E From 6/16/48 Hr. 0800 to 6/17/48 Hr. 0700

FLOWS	SCFH	%
Oxygen	2830	
Nat. Gas	4250	
Total	7080	40.0
Fresh Feed	12300	
F. F. by C	12800	
Avg. F. F.		
Wet Gas	4700	
Contraction		53.5
Recycle	17600	
Bleed	6994	
Total	24594	
Total Feed	36894	
Recycle/F.F.	2.00	
Inlet Vel.		
Steam Flow		

RUN CONDITIONS	
Generator Press.	280
O_2 Preheat, °F	490
Gas Preheat, °F	765
Reactor Press.	248
Steam Back Press.	
Temperatures, °F	
Heater Outlet	
Catalyst #1	645
#2	655
#3	660
#4	625
#5	
Average	
Product Separator	

DISTILLATIONS							
	A S T M			Hempel Dist.		
Prod.	Raw Oil	Gasoline		°F	%	A.P.I.
A.P.I.	46.4			to 400	74.0	52.5
I.B.P.		112		400-550	15.6	35.8
5%				550+		
10%		149				
20		182				
30		208		WATER		
40		230		Temp.	%	
50		250		200		
60		274		203		
70		304		208		
80		332		A.P.I.	10.3	
90		370				
95		400				
E.P.		97.5				
Rec.		1.25				
Res.		1.25				
Loss.						

CATALYST DATA	
In Reactor at Start of Period	610.5
Fresh Catalyst Charged	
Catalyst Recharged	
Total	610.5
Catalyst Taken Out	35.75
In Reactor at End of Period	574.75
Reactor d-P, H_2O	
Pounds in Reactor	
Density, lbs./cu. ft.	
Bed Height, Feet	
Space Vel. SCFH/lb. cat.	
Inventory Figures	64.2
From d-P Meters	

CATALYST ANALYSIS				
Particle Size				
Screen			Sedimentation	
Frac.	M	%	M	%
On 40	420+	7.9	80+	
100	419-150	50.4	80-40	
150	149-105	8.5	40-20	
200	104-74	7.5	20-10	
250	73-62	5.3	10-0	
325	61-44	8.3		
<325	43-0	12.0		
Density, lbs./cu. ft			Chem. Anal.	
Aerated	149.0		% Fe	
Settled	151.0		% C	
Compacted	175.0		% Oil	
Sp. Grav.	4.1		Specific Surface	
			29.7	m^2 gm

NATURAL GAS	%
CO_2	1.60
CH_4	85.95
C_2H_6	9.00
C_3H_8	2.93
C_4H_{10}	.18
N_2	.34
O_2	

PRODUCT INSPECTION						
	Oil	Water	Product	Pour °F	SUS @ °F	
Neut. No.	58.6	49.1				
Sap. No.	60.4	44.1				
Hydrox. No.	58.4					
Bromine No.	62.0					
% Fe						
% Alc		10.0				

GENERATOR ELEMENTAL BALANCE

IN	Mol %	SCFH m/hr	C	H	O
O_2	239.04	7.47			14.94
CO_2	7.92	.18	.18		.36
CH_4	154.08	9.63	9.63	38.52	
C_2H_6	30.30	1.01	2.02	6.06	
C_3H_8	14.52	.33	.99	2.54	
C_4H_{10}	1.16	.02	.08	.20	
N_2	1.12	.04			
Total		18.68	12.90	47.32	15.30

OUT	Mol %	SCFH m/hr	C	H	O
CO_2	2.2	.71	.71		1.42
CO	35.6	11.55	11.55		11.55
CH_4	3.6	1.17	1.17	4.68	
H_2	58.6	19.02		38.04	
N_2					
H_2O				4.66	2.33
Total		32.45	13.43	47.38	15.30

	FRESH FEED			WET GAS					RECYCLE	COMB. FEED		EFFLUENT		NET CHANGE ON REACTION									
					Measured		At Wt. Balance							Carbon			Hydrogen		Oxygen		Ultimate Oil			Unsats.
	%	m/hr	#/hr	%	m/hr	#/hr	m/hr	#/hr	m/hr	m/hr	%	m/hr	%	m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%
CO	35.6	11.55	323.40	12.75	1.58	44.24	1.92	53.81	8.27	19.82	20.36	10.19	12.02	-9.63	-9.63	16.62			-9.63				
H2	58.6	19.02	38.04	43.19	5.36	10.72	6.52	13.04	28.03	47.05	48.33	34.55	40.75	-12.50			-25.00						
CO2	2.2	.71	31.24	21.52	2.67	117.48	3.25	142.89	13.97	14.68	15.08	17.22	20.31	2.54	2.54	21.99			5.08				
N2	-	-	-	.26	.03	2.52	.04	3.07	.17	.17	.17	.21	.25	.04									
CH4	3.6	1.17	18.72	14.54	1.80	28.80	2.19	35.03	9.44	10.61	10.90	11.63	13.72	1.02	1.02	8.83	4.08						
C2H4				1.82	.23	6.44	.28	7.83	1.18	1.18	1.21	1.46	1.72	.28	.56	4.85	1.12						
C2H6				1.38	.17	5.10	.21	6.20	.90	.90	.92	1.11	1.31	.21	.42	3.64	1.26						
C3H6				1.57	.19	7.98	.23	9.71	1.02	1.02	1.05	1.25	1.47	.23	.69	5.97	1.38			8.74	6.25	1.40	
C3H8				.19	.02	.88	.02	1.07	.12	.12	.12	.14	.17	.02	.06	.52	.16						
C4H8				1.14	.14	7.84	.17	9.54	.74	.74	.76	.91	1.07	.17	.68	5.89	1.36			9.06	6.10	1.49	
C4H10				.67	.08	4.64	.10	5.64	.43	.43	.44	.53	.63	.10	.40	3.46	1.00			5.64	4.86	1.16	
C5H10				.66	.08	5.60	.10	6.81	.43	.43	.44	.53	.63	.10	.50	4.33	1.00			6.81	5.40	1.26	
C6H12				.31	.04	3.36	.05	4.09	.20	.20	.21	.25	.29	.05	.30	2.60	.60			4.09	5.50	.74	
OIL								(34.44)				.25	.29		2.46	21.30	4.92			34.44	6.50	5.30	
WATER												4.55	5.37				8.12		(4.06) 4.55				
TOTAL		32.45	411.40		12.40	245.60	15.08	298.73	64.90	97.35	99.99	84.78	100.00	17.37		100.00				58.78		11.35	
H2+CO		30.57			6.94		8.44																
H2/CO		1.65			3.39		3.40			2.37		3.39											

ULTIMATE YIELDS	% C0 Fed	#/hr	H2 / C0 #/MCF	H2 / C0 g/M3	Gal/hr	H2 / C0 Gal/MCF	H2 / C0 cc/M3
C1+C2	17.32	30.34	2.62	44.30			
C3+	44.07	71.30	6.15	104.00			
C4+	37.58	60.52	5.22	88.27			
Ult. Oil		68.78	5.93	100.28	11.35	0.98	138.47
C02	21.99	111.65	9.63	162.84			
H20		81.90	7.07	119.55			

WEIGHT BALANCE	#/hr	%	#/hr
Wet Gas	245.6		298.7
Oil	26.4		26.4
Water	86.3		86.3
Total	358.3	87.1	411.4

EFFLUENT RATIOS	
H2/H20	10.34
C02/C0	1.69
(H2) (C02) / (H20) (C0)	12.83

CONTRACTION: 53.5

C0 Conversion: 83.4

H2 Conversion: 65.7

$H_2 + CO = 72.4$

Yield Calculations assume "oil" is CH2, and is found by difference on Carbon, and H20 by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at 0 C. and 14.7 psig. g/M3 = 16.91 × #/MCF. cc/M3 = 141.3 × gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 42 F From 6/17/48 Hr. 0800 to 6/18/48 Hr. 0700

FLOWS	SCFH	%
Oxygen	2720	
Nat. Gas	4180	
Total	6900	39.4
Fresh Feed	11800	
F. F. by C	12100	
Avg. F. F.		
Wet Gas	5050	
Contraction		48.3
Recycle	18440	
Bleed	13021	
Total	31461	
Total Feed	43261	
Recycle/F.F.	2.60	
Inlet Vel.		
Steam Flow		

RUN CONDITIONS	
Generator Press.	282
O_2 Preheat, °F	490
Gas Preheat, °F	805
Reactor Press.	245
Steam Back Press.	
Temperatures, °F	
Heater Outlet	
Catalyst #1	645
#2	655
#3	660
#4	625
#5	
Average	
Product Separator	

DISTILLATIONS	ASTM Raw Oil	ASTM Gasoline
Prod.		
A.P.I.	46.9	
I.B.P.		108
5%		
10%		150
20		179
30		203
40		224
50		244
60		262
70		284
80		308
90		336
95		368
E.P.		387
Rec.		98.0
Res.		1.0
Loss		1.0

Hempel Dist. °F	%	A.P.I.
to 400	70.6	54.0
400-550	19.3	35.6
550+		

WATER Temp.	%
200	
203	
208	
A.P.I.	10.4

CATALYST DATA	
In Reactor at Start of Period	574.75
Fresh Catalyst Charged	
Catalyst Recharged	
Total	574.75
Catalyst Taken Out	26.00
In Reactor at End of Period	548.75
Reactor d-P, H_2O	
Pounds in Reactor	
Density, lbs./cu. ft	
Bed Height, Feet	
Space Vel. SCFH/lb. cat.	
Inventory Figures	78.8
From d-P Meters	

CATALYST ANALYSIS — Particle Size	Screen			Sedimentation	
	Frac.	M	%	M	%
	On 40	420+	24.7	80−	
	100	419-150	49.3	80-40	
	150	149-105	7.0	40-20	
	200	104-74	4.6	20-10	
	250	73-62	2.2	10-0	
	325	61-44	3.9		
	<325	43-0	8.4		
Density, lbs./cu. ft				Chem. Anal.	
Aerated	147.0			% Fe	
Settled	147.0			% C	
Compacted	156.0			% Oil	
Sp. Grav.	4.6			Specific Surface	
				31.4	m^2 gm

NATURAL GAS	%
CO_2	1.56
CH_4	84.61
C_2H_6	10.29
C_3H_8	3.19
C_4H_{10}	.14
N_2	.20
O_2	

PRODUCT INSPECTION					
	Oil	Water	Product	Pour °F	SUS @ °F
Neut. No.	60.9	44.9			
Sap. No.	62.0	43.5			
Hydrox. No.	60.5				
Bromine No.	72.5				
% Fe					
% Alc		8.9			

GENERATOR ELEMENTAL BALANCE

IN	Mol %	SCFH m/hr	C	H	O
O_2	229.76	7.18			14.36
CO_2	7.48	.17	.17		.34
CH_4	149.28	9.33	9.33	37.32	
C_2H_6	33.90	1.13	2.26	6.78	
C_3H_8	15.40	.35	1.05	2.80	
C_4H_{10}	1.16	.02	.08	.20	
N_2	.56	.02			
Total		18.20	12.89	47.10	14.70

OUT	Mol %	SCFH m/hr	C	H	O
CO_2	2.1	.65	.65		1.30
CO	34.6	10.77	10.77		10.77
CH_4	5.3	1.65	1.65	6.60	
H_2	57.5	17.90		35.80	
N_2	0.5	.16			
H_2O				5.26	2.63
Total		31.13	13.07	47.66	14.70

	FRESH FEED %	m/hr	#/hr	WET GAS %	Measured m/hr	Measured #/hr	At Wt. Balance m/hr	At Wt. Balance #/hr	RECYCLE m/hr	COMB. FEED m/hr	%	EFFLUENT m/hr	%
CO	34.6	10.77	301.56	13.15	1.75	49.00	2.11	59.08	10.64	21.41	19.10	12.75	12.57
H2	57.5	17.90	35.08	44.88	5.98	11.96	7.21	14.42	36.33	54.23	48.39	43.54	42.91
CO2	2.1	.65	28.60	17.60	2.34	102.96	2.82	124.15	14.25	14.90	13.30	17.07	16.82
N2	0.5	.16	4.48	-	-	-	-	-	-	.16	.14	-	-
CH4	5.3	1.65	26.40	17.14	2.28	36.48	2.75	43.99	13.87	15.52	13.85	16.62	16.38
C2H4				1.64	.22	6.16	.27	7.43	1.33	1.33	1.19	1.60	1.58
C2H6				1.29	.17	5.10	.20	6.15	1.04	1.04	.93	1.24	1.22
C3H6				1.41	.19	7.98	.23	9.62	1.14	1.14	1.02	1.37	1.35
C3H8				.27	.04	1.76	.05	2.12	.22	.22	.20	.27	.27
C4H8				1.09	.15	8.40	.18	10.13	.88	.88	.79	1.06	1.04
C4H10				.74	.10	5.80	.12	6.99	.60	.60	.54	.72	.71
C5H10				.59	.08	5.60	.10	6.75	.48	.48	.43	.58	.57
C6H12				.20	.03	2.52	.04	3.04	.16	.16	.14	.20	.20
OIL								(23.38)				.17	.17
WATER												4.28	4.28
TOTAL		31.13	396.84		13.32	243.72	16.08	293.87	80.94	112.07	100.02	101.47	100.01
H2+CO		28.67			7.73		9.32						
H2/CO		1.66			3.42		3.42			2.53		3.41	

NET CHANGE ON REACTION	Carbon m/hr	Carbon a/hr	Carbon %	Hydrogen a/hr	Hydrogen %	Oxygen a/hr	Ultimate Oil #/hr	Ultimate Oil #/gal	Ultimate Oil gal/hr	Unsats. %
CO	-8.66	-8.66	19.59			-8.66				
H2	-10.69			-21.38						
CO2	2.17	2.17	20.15			4.38				
N2	- .16									
CH4	1.10	1.10	10.21	2.20						
C2H4	.27	.54	5.01	1.08						
C2H6	.20	.40	3.71	1.20						
C3H6	.23	.69	6.41	1.38			8.66	6.25	1.39	
C3H8	.05	.15	1.39	.40						
C4H8	.18	.72	6.69	1.44			9.62	6.10	1.58	
C4H10	.12	.48	4.46	1.20			6.99	4.86	1.44	
C5H10	.10	.50	4.64	1.00			6.75	5.40	1.25	
C6H12	.04	.24	2.23	.48			3.04	5.50	.55	
OIL		1.67	15.51	3.34			23.38	6.50	3.60	
WATER				7.66		(3.83) 4.28				
TOTAL	15.05		100.00				58.44		9.81	

ULTIMATE YIELDS	% C0 Fed	#/hr	H2/C0 #/MCF	H2/C0 g/M3	Gal/hr	H2/C0 Gal/MCF	H2/C0 cc/M3
C1+C2	18.93	31.17	2.87	48.53			
C3+	41.33	62.03	5.71	96.56			
C4+	33.53	50.29	4.63	78.29			
Ult. Oil		58.44	5.38	90.98	9.81	0.90	127.17
C02	20.15	95.55	8.80	148.81			
H20		77.04	7.09	119.89			

WEIGHT BALANCE	#/hr	%	#/hr
Wet Gas	243.7		293.8
Oil	30.0		30.0
Water	73.0		73.0
Total	346.7	87.4	396.8

EFFLUENT RATIOS	
H2/H20	10.17
C02/C0	1.34
(H2) (C02) / (H20) (C0)	13.62

CONTRACTION: 48.3

C0 Conversion: 80.4

H2 Conversion: 59.7

$H_2 + CO = 67.5$

Yield Calculations assume "oil" is CH2, and is found by difference on Carbon, and H20 by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at 0 C. and 14.7 psig. g/M3 = 16.91 × #/MCF. cc/M3 = 141.3 × gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 42 G From 6/18/48 Hr. 0800 to 6/19/48 Hr. 0700

FLOWS	SCFH	%
Oxygen	2730	
Nat. Gas	4280	
Total	7010	38.9
Fresh Feed	12000	
F. F. by C	12300	
Avg. F. F.		
Wet Gas	4050	
Contraction		59.5
Recycle	16950	
Bleed	12957	
Total	29907	
Total Feed	41097	
Recycle/F.F.	2.49	
Inlet Vel.		
Steam Flow		

RUN CONDITIONS	
Generator Press.	285
O_2 Preheat, °F	475
Gas Preheat, °F	780
Reactor Press.	245
Steam Back Press.	
Temperatures, °F	
Heater Outlet	
Catalyst #1	630
#2	655
#3	660
#4	625
#5	
Average	
Product Separator	

DISTILLATIONS							
	A S T M			Hempel Dist.			
Prod.	Raw Oil	Gasoline		°F	%	A.P.I.
A.P.I.	49.9			to 400	76.3	54.6
I.B.P.		108		400-550	15.0	34.1
5%				550+		
10%		138				
20		164				
30		190		WATER		
40		210		Temp.	%	
50		230		200		
60		250		203		
70		276		208		
80		304		A.P.I.	10.5	
90		344				
95		376				
E.P.		398				
Rec.		98.0				
Res.		1.0				
Loss		1.0				

CATALYST DATA	
In Reactor at Start of Period	548.75
Fresh Catalyst Charged	
Catalyst Recharged	
Total	548.75
Catalyst Taken Out	41.75
In Reactor at End of Period	507.00
Reactor d-P, H_2O	
Pounds in Reactor	
Density, lbs./cu. ft.	
Bed Height, Feet	
Space Vel. SCFH/lb. cat.	
Inventory Figures	82.7
From d-P Meters	

CATALYST ANALYSIS					
Particle Size					
Screen			Sedimentation		
Frac.	M	%	M	%	
On 40	420+	1.6	80+		
100	419-150	49.0	80-40		
150	149-105	11.2	40-20		
200	104-74	9.4	20-10		
250	73-62	3.8	10-0		
325	61-44	12.4			
<325	43-0	12.6			
Density, lbs./cu. ft			Chem. Anal.		
Aerated	142.0		% Fe		
Settled	144.0		% C		
Compacted	155.0		% Oil		
Sp. Grav.	3.8		Specific Surface		
					m^2 gm

NATURAL GAS	%
CO_2	1.60
CH_4	84.62
C_2H_6	9.76
C_3H_8	3.87
C_4H_{10}	.14
N_2	
O_2	

PRODUCT INSPECTION						
	Oil	Water	Product	Pour °F	SUS @ °F	
Neut. No.	60.2	42.4				
Sap. No.	59.3	41.3				
Hydrox. No.	73.0					
Bromine No.	64.1					
% Fe						
% Alc		11.1				

GENERATOR ELEMENTAL BALANCE

IN	Mol %	SCFH m/hr	C	H	O
O_2	230.40	7.20			14.40
CO_2	7.92	.18	.18		.36
CH_4	152.80	9.55	9.55	38.20	
C_2H_6	33.00	1.10	2.20	6.60	
C_3H_8	19.36	.44	1.32	3.52	
C_4H_{10}	1.16	.02	.08	.20	
N_2					
Total		18.49	13.33	48.52	14.76

OUT	Mol %	SCFH m/hr	C	H	O
CO_2	2.2	.70	.70		1.40
CO	33.9	10.73	10.73		10.73
CH_4	5.1	1.61	1.61	6.44	
H_2	58.8	18.62		37.24	
N_2					
H_2O				5.26	2.63
Total		31.66	13.04	48.94	14.76

	FRESH FEED			WET GAS					RECYCLE	COMB. FEED		EFFLUENT		NET CHANGE ON REACTION									
					Measured		At Wt. Balance							Carbon		Hydrogen		Oxygen	Ultimate Oil			Unsats.
	%	m/hr	#/hr	%	m/hr	#/hr	m/hr	#/hr	m/hr	m/hr	%	m/hr	%	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%
CO	33.9	10.73	300.44	9.77	1.04	29.12	1.25	34.87	7.52	18.25	16.80	8.77	9.19	- 9.48	- 9.48	11.65		- 9.48				
H2	58.8	18.62	37.24	37.73	4.03	8.06	4.83	9.65	29.03	47.65	43.87	33.86	35.49	-13.79			-27.58					
CO2	2.2	.70	30.80	23.46	2.51	110.44	3.01	132.24	18.05	18.75	17.26	21.06	22.08	2.31	2.31	21.53		4.62				
N2	-	-	-	.22	.02	.56	.02	.67	.17	.17	.16	.73	.77	.02								
CH4	5.1	1.61	25.76	18.56	1.98	31.68	2.37	37.93	14.28	15.89	14.63	16.65	17.45	.76	.76	7.08	3.04					
C2H4				2.31	.25	7.00	.30	8.38	1.78	1.78	1.64	2.08	2.18	.30	.60	5.59	1.20					
C2H6				1.65	.18	5.40	.22	6.47	1.27	1.27	1.17	1.49	1.56	.22	.44	4.10	1.32					
C3H6				2.44	.26	10.92	.31	13.08	1.88	1.88	1.73	2.19	2.30	.31	.93	8.67	1.86		11.77	6.25	1.88	
C3H8				.31	.03	1.32	.04	1.58	.24	.24	.22	.28	.29	.04	.12	1.12	.32					
C4H8				1.68	.18	10.08	.22	12.07	1.29	1.29	1.19	1.51	1.58	.22	.88	8.20	1.76		11.47	6.10	1.88	
C4H10				.72	.08	4.64	.10	5.56	.55	.55	.51	.65	.68	.10	.40	3.73	1.00		5.56	4.86	1.14	
C5H10				.80	.09	6.30	.11	7.54	.62	.62	.57	.73	.77	.11	.55	5.13	1.10		7.54	5.40	1.40	
C6H12				.35	.04	3.36	.05	4.02	.27	.27	.25	.32	.34	.05	.30	2.80	.60		4.02	5.50	.73	
OIL								(30.66)				.28	.23		2.19	20.40	4.38		30.66	6.50	4.72	
WATER												4.86	5.09				11.00		(5.50) 4.86				
TOTAL		31.66	394.24		10.68	228.88	12.83	274.06	76.93	108.61	100.00	95.40	100.00	18.83		100.00			71.02		11.75	
H2+CO		29.35			5.07		6.08															
H2/CO		1.74			3.88		3.86			2.61		3.86										

ULTIMATE YIELDS	% CO Fed	#/hr	H2/CO #/MCF	H2/CO g/M3	Gal/hr	H2/CO Gal/MCF	H2/CO cc/M3
C1+C2	16.77	27.02	2.43	41.09			
C3+	50.05	74.51	6.20	104.84			
C4+	40.26	59.85	5.38	90.98			
Ult. Oil		71.02	6.39	108.05	11.75	1.06	149.78
C02	21.53	101.44	9.12	154.22			
H20		87.48	7.87	133.08			

WEIGHT BALANCE	#/hr	%	#/hr
Wet Gas	228.9		273.0
Oil	23.0		23.0
Water	98.2		98.2
Total	350.1	88.8	394.2

EFFLUENT RATIOS	
H2/H20	6.97
C02/C0	2.40
(H2) (C02) / (H20) (C0)	16.97

CONTRACTION: 59.5

C0 Conversion: 88.4

H2 Conversion: 74.1

$H_2 + CO = 79.3$

Yield Calculations assume "oil" is CH2, and is found by difference on Carbon, and H20 by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at 0 C. and 14.7 psig. g/M3 = 16.91 × #/MCF. cc/M3 = 141.3 × gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 42 H From 6/19/48 Hr. 0800 to 6/20/48 Hr. _____

FLOWS	SCFH	%
Oxygen	2920	
Nat. Gas	4340	
Total	7260	40.2
Fresh Feed	12600	
F. F. by C	12600	
Avg. F. F.		
Wet Gas	4760	
Contraction		56.0
Recycle	17120	
Bleed	13028	
Total	30148	
Total Feed	42748	
Recycle/F.F.	2.39	
Inlet Vel.		
Steam Flow		

RUN CONDITIONS	
Generator Press.	292
O_2 Preheat, °F	440
Gas Preheat, °F	735
Reactor Press.	245
Steam Back Press.	
Temperatures, °F	
Heater Outlet	
Catalyst #1	630
#2	650
#3	660
#4	620
#5	
Average	
Product Separator	

DISTILLATIONS	ASTM	
	Raw Oil	Gasoline
Prod.		
A.P.I.	50.9	
I.B.P.		102
5%		
10%		140
20		168
30		190
40		210
50		232
60		254
70		274
80		308
90		344
95		376
E.P.		400
Rec.		98.0
Res.		1.0
Loss		1.0

Hempel Dist.		
°F	%	A.P.I.
to 400	82.1	54.9
400-550	9.6	54.8
550+		

WATER	
Temp.	%
200	
203	
208	
A.P.I.	10.7

CATALYST DATA	
In Reactor at Start of Period	507.0
Fresh Catalyst Charged	
Catalyst Recharged	
Total	507.0
Catalyst Taken Out	5.0
In Reactor at End of Period	502.0
Reactor d-P, H_2O	
Pounds in Reactor	
Density, lbs./cu. ft.	
Bed Height, Feet	
Space Vel. SCFH/lb. cat.	
Inventory Figures	85.2
From d-P Meters	

CATALYST ANALYSIS				
Particle Size				
Screen			Sedimentation	
Frac.	M	%	M	%
On 40	420+	0.6	80+	
100	419-150	61.6	80-40	
150	149-105	13.6	40-20	
200	104-74	8.4	20-10	
250	73-62	2.8	10-0	
325	61-44	5.0		
<325	43-0	8.0		
Density, lbs./cu. ft			Chem. Anal.	
Aerated	130.0		% Fe	
Settled	133.0		% C	
Compacted	139.0		% Oil	
Sp. Grav.	3.9		Specific Surface	
			21.6	m^2 gm

NATURAL GAS	%
CO_2	1.65
CH_4	84.70
C_2H_6	10.12
C_3H_8	3.33
C_4H_{10}	.14
N_2	.07
O_2	

PRODUCT INSPECTION					
	Oil	Water	Product	Pour °F	SUS @ °F
Neut. No.	60.1	44.6			
Sap. No.	63.1	43.0			
Hydrox. No.	80.6				
Bromine No.	65.2				
% Fe					
% Alc		13.0			

GENERATOR ELEMENTAL BALANCE

IN	Mol %	SCFH m/hr	C	H	O
O_2	246.40	7.70			15.40
CO_2	8.36	.19	.19		.38
CH_4	155.20	9.70	9.70	38.80	
C_2H_6	34.80	1.16	2.32	6.96	
C_3H_8	16.72	.38	1.14	3.04	
C_4H_{10}	1.16	.02	.08	.20	
N_2	.28	.01			
Total		19.16	13.43	49.00	15.78

OUT	Mol %	SCFH m/hr	C	H	O
CO_2	2.3	.76	.76		1.52
CO	35.5	11.80	11.80		11.80
CH_4	2.6	.86	.86	3.44	
H_2	58.9	19.58		39.16	
N_2	0.7	.23			
H_2O				4.92	2.46
Total		33.25	13.42	47.52	15.78

	FRESH FEED			WET GAS					RECYCLE	COMB. FEED		EFFLUENT		NET CHANGE ON REACTION								
					Measured		At Wt. Balance							Carbon			Hydrogen		Oxygen	Ultimate Oil			Unsats.
	%	m/hr	#/hr	%	m/hr	#/hr	m/hr	#/hr	m/hr	m/hr	%	m/hr	%	m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%
CO	35.5	11.80	330.40	12.00	1.51	42.28	1.75	49.11	9.54	21.34	18.93	11.29	11.38	-10.05	-10.05	14.83			-10.05				
H2	58.9	19.58	39.16	41.75	5.24	10.48	6.09	12.17	33.18	52.76	46.81	39.27	39.60	-13.49			-26.98						
CO2	2.3	.76	33.44	22.90	2.88	126.72	3.35	147.19	18.20	18.96	16.82	21.55	21.73	2.59	2.59	21.95			5.18				
N2	0.7	.23	6.44	.35	.04	1.12	.05	1.30	.28	.51	.45	.33	.33	- .18									
CH4	2.6	.86	13.76	13.22	1.66	26.56	1.93	30.85	10.51	11.37	10.09	12.44	12.54	1.07	1.07	9.07	4.28						
C2H4				2.23	.28	7.84	.33	9.11	1.77	1.77	1.57	2.10	2.12	.33	.66	5.59	1.32						
C2H6				1.68	.21	6.30	.24	7.32	1.34	1.34	1.19	1.58	1.59	.24	.48	4.07	1.44						
C3H6				2.29	.29	12.18	.34	14.15	1.82	1.82	1.61	2.16	2.18	.34	1.02	8.64	2.04			12.74	6.25	2.04	
C3H8				.31	.04	1.76	.05	2.04	.25	.25	.22	.30	.30	.05	.15	1.27	.40						
C4H8				1.46	.18	10.08	.21	11.71	1.16	1.16	1.03	1.37	1.38	.21	.84	7.12	1.68			11.12	6.10	1.82	
C4H10				.76	.10	5.80	.12	6.74	.60	.60	.53	.72	.73	.12	.48	4.07	1.20			6.74	4.86	1.39	
C5H10				.73	.09	6.30	.10	7.32	.58	.58	.51	.68	.69	.10	.50	4.24	1.00			7.32	5.40	1.36	
C6H12				.32	.04	3.36	.05	3.90	.25	.25	.22	.30	.30	.05	.30	2.54	.60			3.90	5.50	.71	
OIL								(27.44)				.20	.20		1.96	16.61	3.92			27.44	6.50	4.22	
WATER												4.87	4.91				9.10		(4.55) 4.87				
TOTAL		33.25	423.20		12.56	260.78	14.61	302.91	79.47	112.71	99.98	99.16	99.98	18.62		100.00				69.26		11.54	
H2+CO		31.38			6.75		7.84																
H2/CO		1.66			3.47		3.48			2.47		3.48											

ULTIMATE YIELDS	% C0 Fed	#/hr	H2 / C0 #/MCF	H2 / C0 g/M3	Gal/hr	H2 / C0 Gal/MCF	H2 / C0 cc/M3
C1+C2	18.73	33.52	2.82	47.69			
C3+	44.49	73.30	6.16	104.17			
C4+	34.58	57.11	4.80	81.17			
Ult. Oil		69.26	5.83	98.59	11.54	0.97	137.06
C02	21.95	113.75	9.57	161.83			
H20		87.66	7.37	124.63			

WEIGHT BALANCE	#/hr	%	#/hr
Wet Gas	260.8		302.6
Oil	23.4		23.4
Water	97.2		97.2
Total	381.4	90.1	423.2

EFFLUENT RATIOS	
H2/H20	8.06
C02/C0	1.91
(H2) (C02) / (H20) (C0)	15.27

CONTRACTION:	56.0
C0 Conversion:	85.2
H2 Conversion:	69.0

$H_2 + CO = 75.1$

Yield Calculations assume "oil" is CH2, and is found by difference on Carbon, and H20 by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at 0 C. and 14.7 psig. g/M3 = 16.91 × #/MCF. cc/M3 = 141.3 × gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 42 I From 6/20/48 Hr. 0800 to 6/21/48 Hr. 0700

FLOWS	SCFH	%
Oxygen	2960	
Nat. Gas	4240	
Total	7200	41.1
Fresh Feed	12350	
F. F. by C	12600	
Avg. F. F.		
Wet Gas	4950	
Contraction		54.7
Recycle	16860	
Bleed	5145	
Total	22005	
Total Feed	34355	
Recycle/F.F.	1.75	
Inlet Vel.		
Steam Flow		

RUN CONDITIONS	
Generator Press.	275
O_2 Preheat, °F	510
Gas Preheat, °F	740
Reactor Press.	234
Steam Back Press.	
Temperatures, °F	
Heater Outlet	
Catalyst #1	640
#2	655
#3	660
#4	620
#5	
Average	
Product Separator	

DISTILLATIONS	A S T M	
Prod.	Raw Oil	Gasoline
A.P.I.	48.4	
I.B.P.		110
5%		
10%		152
20		180
30		200
40		220
50		240
60		260
70		282
80		310
90		344
95		376
E.P.		399
Rec.		98.0
Res.		1.0
Loss.		1.0

Hempel Dist.		
°F	%	A.P.I.
to 400	80.6	53.2
400-550	14.6	33.0
550+		

WATER	
Temp.	%
200	
203	
208	
A.P.I.	10.4

CATALYST DATA	
In Reactor at Start of Period	502.0
Fresh Catalyst Charged	
Catalyst Recharged	
Total	502.0
Catalyst Taken Out	11.0
In Reactor at End of Period	491.0
Reactor d-P, H_2O	
Pounds in Reactor	
Density, lbs./cu. ft.	
Bed Height, Feet	
Space Vel. SCFH/lb. cat.	
Inventory Figures	70.0
From d-P Meters	

CATALYST ANALYSIS				
Particle Size				
Screen			Sedimentation	
Frac.	M	%	M	%
On 40	420+	0.6	80+	
100	419-150	46.0	80-40	
150	149-105	15.6	40-20	
200	104-74	9.6	20-10	
250	73-62	3.4	10-0	
325	61-44	8.6		
<325	43-0	16.2		
Density, lbs./cu. ft.			Chem. Anal.	
Aerated	135.0		% Fe	
Settled	137.0		% C	
Compacted	155.0		% Oil	
Sp. Grav.	3.74		Specific Surface	
			22.9	m^2 gm

NATURAL GAS	%
CO_2	1.65
CH_4	84.85
C_2H_6	9.28
C_3H_8	3.67
C_4H_{10}	.16
N_2	.39
O_2	

PRODUCT INSPECTION					
	Oil	Water	Product	Pour °F	SUS @ °F
Neut. No.	60.4	42.4			
Sap. No.	61.5	39.8			
Hydrox. No.	72.2				
Bromine No.	69.2				
% Fe					
% Alc		8.9			

GENERATOR ELEMENTAL BALANCE

IN	Mol %	SCFH m/hr	C	H	O
O_2	249.92	7.81			15.62
CO_2	7.92	.18	.18		.36
CH_4	151.84	9.49	9.49	37.96	
C_2H_6	31.20	1.04	2.08	6.24	
C_3H_8	18.04	.41	1.23	3.28	
C_4H_{10}	1.16	.02	.08	.20	
N_2	1.12	.04			
Total		17.99	13.06	47.68	15.98

OUT	Mol %	SCFH m/hr	C	H	O
CO_2	2.2	.72	.72		1.44
CO	35.6	11.60	11.60		11.60
CH_4	2.3	.75	.75	3.00	
H_2	59.3	19.32		38.64	
N_2	0.6	.20			
H_2O				5.88	2.94
Total		32.59	13.07	47.52	15.98

	FRESH FEED %	FRESH FEED m/hr	FRESH FEED #/hr	WET GAS %	WET GAS Measured m/hr	WET GAS Measured #/hr	WET GAS At Wt. Balance m/hr	WET GAS At Wt. Balance #/hr	RECYCLE m/hr	COMB. FEED m/hr	COMB. FEED %	EFFLUENT m/hr	EFFLUENT %
CO	35.6	11.60	324.80	13.17	1.72	48.16	1.94	54.31	7.51	19.11	21.32	9.45	12.35
H2	59.3	19.32	38.64	41.79	5.46	10.92	6.16	12.31	23.83	43.15	48.14	29.99	39.20
CO2	2.2	.72	31.68	22.14	2.89	127.16	3.26	143.40	12.62	13.34	14.88	15.88	20.76
N2	0.6	.20	5.60	.36	.05	1.40	.06	1.58	.21	.41	.46	.27	.35
CH4	2.3	.75	12.00	12.01	1.57	25.12	1.77	28.33	6.85	7.60	8.48	8.62	11.27
C2H4				2.12	.28	7.84	.32	8.84	1.21	1.21	1.35	1.53	2.00
C2H6				1.63	.21	6.30	.24	7.10	.93	.93	1.04	1.17	1.53
C3H6				2.42	.32	13.44	.36	15.16	1.38	1.38	1.54	1.74	2.27
C3H8				.33	.04	1.76	.05	1.98	.19	.19	.21	.24	.31
C4H8				1.71	.22	12.32	.25	13.89	.98	.98	1.09	1.23	1.61
C4H10				.95	.12	6.96	.14	7.85	.54	.54	.60	.68	.89
C5H10				.94	.12	8.40	.14	9.47	.54	.54	.60	.68	.89
C6H12				.43	.06	5.04	.07	5.68	.25	.25	.28	.32	.42
OIL								(16.38)				.12	.16
WATER												4.58	5.99
TOTAL		32.58	412.72		13.06	274.82	14.76	309.90	57.02	89.63	99.99	76.50	100.00
H2+CO		30.92			7.18		8.10			2.26		3.17	
H2/CO		1.67			3.17		3.18						

NET CHANGE ON REACTION	Carbon m/hr	Carbon a/hr	Carbon %	Hydrogen a/hr	Hydrogen %	Oxygen a/hr	Ultimate Oil #/hr	Ultimate Oil #/gal	Ultimate Oil gal/hr	Unsats. %
CO	- 9.66	- 9.66	16.72			- 9.66				
H2	-13.16			-26.32						
CO2	2.54	2.54	21.90			5.08				
N2	- .14									
CH4	1.02	1.02	8.79	4.08						
C2H4	.32	.64	5.52	1.28						
C2H6	.24	.48	4.14	1.44						
C3H6	.36	1.08	9.31	2.16			13.64	6.25	2.18	
C3H8	.05	.15	1.29	.40						
C4H8	.25	1.00	8.62	2.00			13.20	6.10	2.16	
C4H10	.14	.56	4.83	1.40			7.85	4.86	1.62	
C5H10	.14	.60	5.17	1.40			9.47	5.40	1.75	
C6H12	.07	.42	3.62	.84			5.68	5.50	1.03	
OIL		1.17	10.09	2.34			16.38	6.50	2.52	
WATER				8.98		(4.49) 4.58				
TOTAL	17.83		100.00				66.22		11.26	

ULTIMATE YIELDS	% C0 Fed	#/hr	H2 / C0 #/MCF	H2 / C0 g/M3	Gal/hr	H2 / C0 Gal/MCF	H2 / C0 cc/M3
C1+C2	18.45	32.27	2.75	46.50			
C3+	42.93	70.41	6.01	101.63			
C4+	32.33	53.27	4.55	76.94			
Ult. Oil		66.22	5.65	95.54	11.26	0.96	135.65
C02	21.90	111.72	9.53	161.15			
H20		82.44	7.03	118.88			

WEIGHT BALANCE	#/hr	%	#/hr
Wet Gas	274.8		309.1
Oil	21.4		21.4
Water	82.2		82.2
Total	378.4	91.7	412.7

EFFLUENT RATIOS	
H2/H20	6.55
C02/C0	1.68
(H2) (C02) / (H20) (C0)	11.00

CONTRACTION: 54.7

C0 Conversion: 83.3

H2 Conversion: 68.1

$H_2 + CO = 73.8$

Yield Calculations assume "oil" is CH2, and is found by difference on Carbon, and H20 by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at 0 C. and 14.7 psig. g/M3 = 16.91 × #/MCF. cc/M3 = 141.3 × gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 42 J From 6/21/48 Hr. 0800 to 6/22/48 Hr. 0700

FLOWS	SCFH	%
Oxygen	2860	
Nat. Gas	4230	
Total	7090	40.3
Fresh Feed	12400	
F. F. by C	12900	
Avg. F. F.		
Wet Gas	5020	
Contraction		55.7
Recycle	17280	
Bleed	9047	
Total	26327	
Total Feed	38727	
Recycle/F.F.	2.12	
Inlet Vel.		
Steam Flow		

RUN CONDITIONS	
Generator Press.	275
O_2 Preheat, °F	490
Gas Preheat, °F	765
Reactor Press.	230
Steam Back Press.	
Temperatures, °F	
Heater Outlet	
Catalyst #1	650
#2	660
#3	660
#4	630
#5	
Average	
Product Separator	

DISTILLATIONS							
	A S T M				Hempel Dist.		
Prod.	Raw Oil	Gasoline			°F	%	A.P.I.
A.P.I.	48.8				to 400	82.0	53.4
I.B.P.		112			400-550	14.2	34.0
5%					550+		
10%		150					
20		176					
30		200			WATER		
40		220			Temp.		%
50		240			200		
60		260			203		
70		280			208		
80		310			A.P.I.		10.4
90		342					
95		378					
E.P.		400					
Rec.		97.5					
Res.		1.2					
Loss		1.3					

CATALYST DATA	
In Reactor at Start of Period	491.0
Fresh Catalyst Charged	
Catalyst Recharged	
Total	491.0
Catalyst Taken Out	2.5
In Reactor at End of Period	488.5
Reactor d-P, H_2O	
Pounds in Reactor	
Density, lbs./cu. ft.	
Bed Height, Feet	
Space Vel. SCFH/lb. cat.	
Inventory Figures	79.4
From d-P Meters	

CATALYST ANALYSIS					
Particle Size					
Screen			Sedimentation		
Frac.	M	%	M	%	
On 40	420+	0.4	80+		
100	419-150	44.7	80-40		
150	149-105	17.8	40-20		
200	104-74	9.6	20-10		
250	73-62	3.4	10-0		
325	61-44	11.2			
<325	43-0	12.8			
Density, lbs./cu. ft			Chem. Anal		
Aerated	127.2		% Fe		
Settled	131.0		% C		
Compacted	153.0		% Oil		
Sp. Gravity	4.1		Specific Surface		
			24.2		m^2 gm

NATURAL GAS	%
CO_2	1.44
CH_4	83.92
C_2H_6	9.72
C_3H_8	4.35
C_4H_{10}	.18
N_2	.39
O_2	

PRODUCT INSPECTION					
	Oil	Water	Product	Pour °F	SUS @ °F
Neut. No.	59.9	43.3			
Sap. No.	60.8	41.2			
Hydrox No.	76.9				
Bromine No.	65.4				
% Fe					
% Alc		10.0			

GENERATOR ELEMENTAL BALANCE

IN	Mol %	SCFH m/hr	C	H	O
O_2	241.60	7.55			15.10
CO_2	7.04	.16	.16		.32
CH_4	149.92	9.37	9.37	37.48	
C_2H_6	32.40	1.08	2.16	6.48	
C_3H_8	21.56	.49	1.47	3.12	
C_4H_{10}	1.16	.02	.08	.20	
N_2	1.12	.04			
Total		18.71	13.24	47.28	15.42

OUT	Mol %	SCFH m/hr	C	H	O
CO_2	2.1	.69	.69		1.38
CO	34.6	11.32	11.32		11.32
CH_4	2.4	.79	.79	3.16	
H_2	60.2	19.70		39.40	
N_2	0.7	.23			
H_2O				5.44	2.72
Total		32.73	12.80	48.00	15.42

	FRESH FEED			WET GAS					RECYCLE	COMB. FEED		EFFLUENT		NET CHANGE ON REACTION								
					Measured		At Wt. Balance							Carbon			Hydrogen		Oxygen	Ultimate Oil			Unsats.
	%	m/hr	#/hr	%	m/hr	#/hr	m/hr	#/hr	m/hr	m/hr	%	m/hr	%	m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%
CO	34.6	11.32	316.96	13.01	1.72	48.16	1.88	52.65	9.03	20.35	19.94	10.91	12.32	- 9.44	- 9.44	16.61			- 9.44				
H2	60.2	19.70	39.40	43.39	5.75	11.50	6.29	12.57	30.10	49.80	48.80	36.39	41.09	-13.41			-26.82						
CO2	2.1	.69	30.36	21.66	2.87	126.28	3.14	138.06	15.03	15.72	15.40	18.17	20.52	2.45	2.45	21.64	.		4.90				
N2	0.7	.23	6.44	.43	.06	1.68	.07	1.84	.30	.53	.52	.37	.42	- .16									
CH4	2.4	.79	12.64	12.21	1.62	25.92	1.77	28.34	8.47	9.26	9.07	10.24	11.56	.98	.98	8.66	3.92						
C2H4				1.89	.25	7.00	.27	7.65	1.31	1.31	1.28	1.58	1.78	.27	.54	4.77	1.18						
C2H6				1.51	.20	6.00	.22	6.56	1.05	1.05	1.03	1.27	1.43	.22	.44	3.89	1.32						
C3H6				2.16	.29	12.18	.32	13.32	1.50	1.50	1.47	1.82	2.05	.32	.96	8.48	1.92			11.99	6.25	1.92	
C3H8				.46	.06	2.64	.07	2.89	.32	.32	.31	.39	.44	.07	.21	1.86	.56			3.67	5.50	.67	
C4H8				1.63	.22	12.32	.24	13.47	1.13	1.13	1.11	1.37	1.55	.24	.72	6.36	1.92			12.80	6.10	2.10	
C4H10				.52	.07	4.06	.08	4.44	.36	.36	.35	.44	.50	.08	.32	2.83	.80			4.44	4.86	.91	
C5H10				.72	.10	7.00	.11	7.65	.50	.50	.49	.61	.69	.11	.55	4.86	1.10			7.65	5.40	1.42	
C6H12				.31	.04	3.36	.04	3.67	.22	.22	.22	.26	.29	.04	.24	2.12	.48			3.67	5.50	.67	
OIL								(28.42)				.20	.23		2.03	17.93	4.06			28.42	6.50	4.37	
WATER												4.54	5.13				9.56		(4.78) 4.54				
TOTAL		32.72	405.80		13.25	268.10	14.50	293.11	69.37	102.05	99.99	88.56	100.0	18.23		100.01				68.97		11.39	
H2+CO		31.02			7.47		8.17																
H2/CO		1.74			3.34		3.35			2.45		3.34											

ULTIMATE YIELDS	% C0 Fed	#/hr	H2 / C0 #/MCF	H2 / C0 g/M3	Gal/hr	H2 / C0 Gal/MCF	H2 / C0 cc/M3
C1+C2	17.32	29.91	2.54	42.95			
C3+	44.44	73.86	6.28	106.19			
C4+	34.10	57.65	4.90	82.86			
Ult. Oil		68.97	5.86	99.09	11.39	0.97	137.06
C02	21.64	107.70	9.16	154.90			
H20		81.72	6.95	117.52			

WEIGHT BALANCE	#/hr	%	#/hr
Wet Gas	268.1		293.6
Oil	20.8		20.8
Water	91.4		91.4
Total	380.3	93.8	405.8

EFFLUENT RATIOS	
H2/H20	8.02
C02/C0	1.67
(H2) (C02) / (H20) (C0)	13.35

CONTRACTION: 55.7

C0 Conversion: 83.4

H2 Conversion: 68.1

$H_2 + CO = 73.7$

Yield Calculations assume "oil" is CH2, and is found by difference on Carbon, and H20 by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at 0 C. and 14.7 psig. g/M3 = 16.91 × #/MCF. cc/M3 = 141.3 × gal/MCF.