

**THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA CALCULATION and SUMMARY SHEET**

Synthesis Run Number 214 From 7/2/47 Hr. 1800 to 7/4/47 Hr. 0700

FRESH FEED								LIQUID YIELDS								CATALYST DATA					
	Orsat	Corr. Fac.	Cor. Orsat	M. S.	M. W.	Calc. M.W.	C. N.	Oil Tank #				Water Tank #				In Reactor at Start of Period					
CO ₂			2.0		44	.88	40.8	GAUGES, INCHES				Total				364					
CO			34.9		28	8.78		Total	O/W	Oil	Gals.	Corr.	Total	Gauge	Gals.	Corr.	Total	Fresh Catalyst Charged			
CH ₄			2.9		16	.63		At End of Period						5.1				Catalyst Recharged			
H ₂			58.0		2	1.16		At Start of Period	6.74					76				Total			
N ₂			1.2		28	.74		Production	12.14					49	22.4%	99		Catalyst Taken Out			
Mol. Wt.								Samples										In Reactor at End of Period			
								Uncorrected Production						49		99		Reactor d-P, H ₂ O			
								G. P. H.						3.77		7.6		Pounds in Reactor			
								Temperature, °F						65		75		Density, lbs./cu. ft.			
								G.P.H. at 60°F						3.76		7.6		Bed Height, Feet			
								A.P.I. at 60°F						48.1		9.1					
								Pounds Per Hour						24.6		63.6					
FLOW CALCULATIONS								RUN CONDITIONS				DISTILLATIONS				CATALYST ANALYSIS					
								Generator Press.	317	ASTM				WATER				Space Vel. SCFH/lb. cat.			
Oxygen						1750		O ₂ Preheat, °F	382	Prod.			Temp.	%	Inventory Figures						
Nat. Gas						2260		Gas Preheat, °F	770	A.P.I.			200	From d-P Meters							
Total						4010	43.9	Reactor Press.	299	I.B.P.			203								
Fresh Feed						7350		Steam Back Press.	610	10%			208								
F. F. by C						6650		Temperatures, °F													
Avg. F. F.						7000		Heater Outlet	571	20											
Wet Gas						2830		Catalyst #1	675	30											
Contraction							59.6	#2	675	40											
Recycle						9750		#3	591	50											
Bleed						530		#4	584	60											
Total						10100		#5	532	70											
Total Feed						16750		Average	605	80											
Recycle/F.F.						145		Product Separator		90											
Inlet Vel.						110				E.P.											
Steam Flow										Rec.											
2000 → 200										Res.											
200 → 200										Loss.											
WEIGHT BALANCE								PRODUCT INSPECTION				PHYSICAL TESTS				CATALYST ANALYSIS					
In	F. F. = SCFH × MW/379 =							236	Hempel Dist.				Chemicals				Particle Size				
Out	Wet Gas							144	°F % A.P.I.				Oil				Screen				
	Oil							24.6	to 400				Water				Sedimentation				
	Water							63.6	400-550				Neut. Sap.				Frac. M % M %				
	Loss								550+				Hydrox. % Fe % Alc				On 40 420+ 80+				
Total								232.2	98.5					Product				100 419-150 80-40			
														Product				150 149-105 40-20			
														Product				200 104-74 20-10			
														Product				250 73-62 10-0			
														Product				325 61-44			
														Product				<325 43-0			
														Product				Density, lbs./cu. ft. Chem. Anal.			
														Product				Aerated % Fe			
														Product				Settled % C			
														Product				Compacted % Oil			
														Product				Sp. Grav. Specific Surface m ² /gm			

MAKE GAS	FRESH FEED				WET GAS				RECYCLE	COMB. FEED	EFFLUENT	NET CHANGE ON REACTION																
	%	m/hr	#/hr	%	Measured m/hr	At Wt. Balance #/hr	m/hr	m/hr				%	m/hr	%	Carbon			Hydrogen		Oxygen	Ultimate Oil	Unsat.						
CO	34.9	6.77	18.956	8.26	.62	17.36	.68	19.04	2.32	9.09	19.12	3.00	7.72	-6.09	-6.09	10.04												
H ₂	58.0	11.25	22.50	29.89	2.98	5.96	3.27	6.54	11.22	22.47	47.28	14.49	32.38	-7.98		-15.96												
CO ₂	2.0	.39	17.16	20.75	1.55	68.20	1.70	74.78	5.83	6.22	13.09	7.53	19.37	1.31	1.31	19.35												
N ₂	1.2	.23	6.44	.79	.06	1.68	.07	1.84	.22	.45	.95	.29	.75	.16														
CH ₄	3.9	.76	12.16	21.85	1.63	26.08	1.79	28.60	6.14	6.90	14.52	7.93	20.40	1.03	1.03	15.21	4.12											
C ₂ H ₄					.13	3.64	.14	3.99	.48	.48	1.01	.62	1.60	.14	.28	4.14	.56											48.42
C ₂ H ₆					.13	3.90	.14	4.28	.51	.51	1.07	.65	1.67	.14	.28	4.14	.84											
C ₃ H ₆					.16	6.72	.18	7.37	.62	.62	1.30	.80	2.06	.18	.54	7.98	1.08											75.00
C ₃ H ₈					.05	2.20	.05	2.41	.21	.21	.44	.26	.67	.05	.15	2.22	.40											
C ₄ H ₈					.11	6.16	.12	6.75	.41	.41	.86	.53	1.36	.12	.48	7.09	.96											
C ₅ H ₁₀					.05	3.50	.05	3.84	.17	.17	.36	.22	.57	.05	.25	3.69	.50											
C ₆ H ₁₂																												
OIL								(24.78)				.08	.21		1.77	26.14	3.54											
WATER												2.97	6.35		3.96													
TOTAL		19.39	24.78		7.47	145.40	8.19	158.44	28.12	47.53	100.00	38.87	100.01	11.31	100.00													
H ₂ +CO		18.02					3.95																					
H ₂ /CO		1.66					4.81																					
ULTIMATE YIELDS								WEIGHT BALANCE				EFFLUENT RATIOS				CONTRACTION: 58.3												
	%	#/hr	H ₂ /CO		H ₂ /CO		H ₂ /CO		Wet Gas				H ₂ /H ₂ O				CO Conversion: 89.9											
C ₁ +C ₂	23.49	24.71	3.67	61.21					145.4				158.6				4.18											
C ₃ +C ₄	47.12	45.15	6.61	111.78					24.6				24.6				2.51											
Ult. Oil		41.66	6.10	103.15	6.63	.97	137.06	63.6				63.6				10.48												
CO ₂	19.35	57.62	8.44	142.72					233.6				94.3				247.8											
H ₂ O		62.46	9.14	154.56																								

Yield Calculations assume "oil" is CH₂, and is found by difference on Carbon, and H₂O 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 CALCULATION and SUMMARY SHEET**

Synthesis Run Number 213 From 7/9/47 Hr. 0700 to 7/10/47 Hr. 0700

FRESH FEED								LIQUID YIELDS										CATALYST DATA									
	Orsat	Corr. Fac.	Cor. Orsat	M. S.	M. W.	Calc. M. W.	C. N.	Oil Tank #					Water Tank #					In Reactor at Start of Period									
CO ₂			2.1		44	1.82	41.6	GAUGES INCHES					Total					34.7									
CO			35.4		28	2.83		Total	O/W	Oil	Gals.	Corr.	Total	Gauge	Gals.	Corr.	Total	Fresh Catalyst Charged									
CH ₄			4.1		16	1.66		At End of Period						5.51				Catalyst Recharged									
H ₂			57.9		2	1.16		At Start of Period	1.9					5.84				Total									
N ₂			0.5		28	.14		Production	14.42					66.1	27		11.8	Catalyst Taken Out									
Mol. Wt.								Samples						5			5	In Reactor at End of Period									
								Uncorrected Production						7.1			12.3	Reactor d-P, H ₂ O									
								G. P. H.						2.26			5.13	27									
								Temperature, °F						62			70	Pounds in Reactor									
								G.P.H. at 60°F						2.95			3.70	307									
								A.P.I. at 60°F						47.4			9.8	Density, lbs./cu. ft.									
								Pounds Per Hour						19.4			42.5	5.0									
FLOW CALCULATIONS								RUN CONDITIONS					DISTILLATIONS					CATALYST ANALYSIS									
	Coeff	Chart	Fp	Ft	Fm.w.	SCFH	%	Generator Press.	321	ASTM					WATER					Particle Size							
Oxygen						1750		O ₂ Preheat, °F	444	Prod.				Temp.	%	Screen											
Nat. Gas						2250		Gas Preheat, °F	244	A.P.I.				200		Sedimentation											
Total						4000	43.6	Reactor Press.	282	I.B.P.				203		On 40											
Fresh Feed						7300		Steam Back Press.	450	20%				208		100											
F. F. by C						6500		Temperatures, °F		10						150											
Avg. F. F.								Heater Outlet	387	30						200											
Wet Gas						3430		Catalyst #1	635	40						104-150											
Contraction								#2	630	50						149-105											
Recycle						8300		#3	594	60						104-74											
Bleed						341		#4	579	70						73-62											
Total						8640		#5	486	80						61-44											
Total Feed						15140		Average	583	90						<325											
Recycle/F.F.						133		Product Separator		E.P.						43-0											
Inlet Vel.						1.82				Rec.						Density, lbs./cu. ft.											
Steam Flow						117.9/400				Res.						Aerated											
1/2 CO → CO						24.0				Loss.						Settled											
CO ₂ → CO																Compacted											
WEIGHT BALANCE								PRODUCT INSPECTION					PHYSICAL TESTS					CATALYST ANALYSIS									
In	F. F. = SCFH x MW/379 =							Hempel Dist.					Chemicals					Oil									
Out	Wet Gas	218						°F					% A.P.I.					Water					Product				
	Oil	19.4						to 400					Neut. # Sap.										Pour °F				
	Water	42.5						400-550					Hydrox # % Fe										SUS @ °F				
	Loss							550+					% Alc										SFS @ °F				
	Total	221.9																					Sp. Grav.				
	1/2 CO → CO	22.9																					Specific Surface				
																							m ² /gm				

	FRESH FEED			WET GAS				RECYCLE	COMB. FEED	EFFLUENT	NET CHANGE ON REACTION													
	%	m/hr	#/hr	%	m/hr	#/hr	At Wt. Balance				m/hr	m/hr	%	m/hr	%	Carbon			Hydrogen			Oxygen	Ultimate Oil	
CO	34.7	6.68	187.04	14.08	1.27	35.56	1.59	44.52	3.21	9.89	23.51	4.80	12.01	-5.09	-5.09	23.80				-5.09				
H ₂	55.6	10.71	21.92	48.50	4.34	8.78	5.49	10.98	11.06	21.77	51.76	16.55	42.06	-5.22		-12.44								
CO ₂	2.0	.39	17.16	14.80	1.34	58.96	1.64	73.92	3.37	3.76	8.74	5.05	13.75	1.29	1.29	19.31				2.58				
N ₂	3.0	.58	16.24	2.54	.23	6.44	.29	9.12	.58	1.16	2.16	.87	3.57	-1.29										
CH ₄	4.7	.91	14.56	13.85	1.25	30.00	1.56	24.96	3.16	4.07	9.68	4.72	12.85	.65	.65	9.73	2.60							
C ₂ H ₄				1.29	.12	3.36	.15	4.20	.29	.29	1.67	.44	1.20	.15	.30	4.49	.60						161.22	
C ₂ H ₆				.80	.07	2.10	.08	2.70	.18	.18	1.43	.37	1.14	.09	.18	2.64	.54							
C ₃ H ₆				1.51	.14	5.88	.18	7.56	.34	.34	.81	1.52	1.42	.18	.54	8.08	1.08				6.80	6.25	1.07	168.64
C ₃ H ₈				.69	.06	2.64	.08	3.52	.16	.16	.58	1.24	1.65	.08	.24	3.59	.04							
C ₄ H ₈				1.06	.10	5.60	.13	7.28	.24	.24	.59	.37	1.01	.13	.52	7.78	1.04				6.82	6.10	1.13	88.33
C ₄ H ₁₀				.14	.01	.58	.01	.58	.03	.03	.07	.04	.11	.01	.04	.60	.10				.58	4.86	.12	
C ₅ H ₁₀				.57	.05	3.50	.06	4.20	.13	.13	.31	.19	.52	.06	.30	4.49	.60				4.20	5.40	.18	
C ₆ H ₁₂				.17	.02	1.68	.03	2.52	.04	.04	.10	.07	.19	.03	.18	2.69	.36				2.53	5.50	.14	
OIL								(11.90)				.09	.25		.85	12.72	1.70				(10.39)	11.90	6.50	1.83
WATER												2.51	6.83				1.18				2.51			
TOTAL		19.26	256.42			9.05	155.14	11.34	195.06	22.79	42.06	100.01	36.73	100.2	7.93	99.98					32.92		5.41	
H ₂ +CO		17.39																						
H ₂ /CO		1.60																						
ULTIMATE YIELDS								WEIGHT BALANCE			EFFLUENT RATIOS			CONTRACTION: 41.2										
	% CO Fed	#/hr	#/MCF	g/M3	Gal/hr	Gal/MCF	cc/M3	Wet Gas	#/hr	%	#/hr	H ₂ /H ₂ O	C ₀ Conversion: 76.3											
C ₁ +C ₂	16.91	17.30	2.63	44.47				Oil	19.4		19.4	C ₀ /C ₀	H ₂ Conversion: 48.7											
C ₃ +	39.95	37.56	5.70	96.39				Water	42.5		42.5	(H ₂)/C ₀	N ₂ +CO = 53.5											
C ₄ +	28.28	26.48	4.02	67.98				Total	217.0	84.8	256.4	(H ₂)/(H ₂ O)												
Ult. Oil		32.92	4.99	84.38	5.41	.82	115.87																	
CO ₂	19.31	56.76	8.61	145.60																				
H ₂ O		45.18	6.86	116.00																				

Yield Calculations assume "oil" is CH₂, and is found by difference on Carbon, and H₂O 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 x #/MCF. cc/M3 = 141.3 x gal/MCF.

**THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA CALCULATION and SUMMARY SHEET**

Synthesis Run Number 21C From 7/10/47 Hr. 0700 to 7/11/47 Hr. 0700

FRESH FEED								LIQUID YIELDS										CATALYST DATA					
	Orsat	Corr. Fac.	Cor. Orsat	M. S.	M. W.	Calc. M.W.	C. N.	Oil Tank #					Water Tank #					In Reactor at Start of Period					
CO ₂			1.8		44	179	384	GAUGES, INCHES					Gauge					284.5					
CO			24.0		28	254		Total	O/W	Oil	Gals.	Corr.	Total	Gauge	Gals.	Corr.	Total	Fresh Catalyst Charged					
CH ₄			2.6		16	57		At End of Period						80.6	26.7		Catalyst Recharged						
H ₂			60.0		2	1.20		At Start of Period						85.6	6		Total						
N ₂			0.6		28	1.6		Production	16			2.2	72.6	5	20.4	113	Catalyst Taken Out						
Mol. Wt.						12.26		Samples					5		5	In Reactor at End of Period							
						1.54		Uncorrected Production					77.6		118	276.5							
								G. P. H.					3.2		46.7	Reactor d-P, H ₂ O							
								Temperature, °F					64		66	Pounds in Reactor							
								G.P.H. at 60°F					3.2		4.85	Density, lbs./cu. ft.							
								A.P.I. at 60°F					46.5		10.7	Bed Height, Feet							
								Pounds Per Hour					21.8		39.8	4.5							
FLOW CALCULATIONS								RUN CONDITIONS					DISTILLATIONS					CATALYST ANALYSIS					
	Coef	Chart	Fp	Ft	F.m.w.	SCFH	%	Generator Press.	312	ASTM					WATER					Space Vel. SCFH/lb. cat.			
Oxygen						1790		O ₂ Preheat, °F	517	Prod.				Temp.	%	Inventory Figures							
Nat. Gas						2240		Gas Preheat, °F	258	A.P.I.				200		From d-P Meters							
Total						4080	44.0	Reactor Press.	285	I.B.P.				203		24.0							
Fresh Feed						6280		Steam Back Press.	450	10%				208		CATALYST ANALYSIS							
F. F. by C						6970		Temperatures, °F		20						Particle Size							
Avg. F. F.						3600		Heater: Outlet	455	30						Screen				Sedimentation			
Wet Gas						3600		Catalyst #1	630	40						Frac.	M	%	M	%			
Contraction						48.3		#2	612	50						On 40	420+		80+				
Recycle						7700		#3	540	60						100	419-150		80-40				
Bleed						310		#4	517	70						150	149-105		40-20				
Total						18010		#5	497	80						200	104-74		20-10				
Total Feed						16980		Average	559	90						250	73-62		10-0				
Recycle/F.F.						1.44		Product Separator		E.P.						325	61-44						
Inlet Vel.						1.03				Rec.						<325	43-0						
Steam Flow						131.7 lb				Loss.						Density, lbs./cu. ft.				Chem. Anal.			
2600 → 22						25.6										Aerated				% Fe			
WEIGHT BALANCE								PRODUCT INSPECTION					PHYSICAL TESTS					CATALYST ANALYSIS					
In	F. F. = SCFH x MW/379 =							Hempel I ...	Chemicals	Oil	Water	Product					Aerated						
Out <td>Wet Gas</td> <td colspan="6">224</td> <td>°F</td> <td>%</td> <td>A.P.I.</td> <td></td> <td colspan="5">Paup °F</td> <td colspan="4">Settled</td>	Wet Gas	224						°F	%	A.P.I.		Paup °F					Settled						
	Oil	21.8						to 400				SUS @ °F					% C						
	Water	348						400-550		Neut. #		SFS @ °F					% Oil						
	Loss	229.6						550+		Sop. #							Sp. Grav.						
	Total	102								Hydrox							Specific Surface						
										% Fe							m ² /gm						
										% Alc													

FRESH FEED				WET GAS				RECYCLE	COMB. FEED	EFFLUENT	NET CHANGE ON REACTION											
	%	m/hr	#/hr	%	Measured	At Wt. Balance	m/hr	m/hr	%	m/hr	%	Carbon			Hydrogen			Oxygen	Ultimate Oil			Unsat.
					m/hr	#/hr	m/hr					m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%	
CO																						
H ₂																						
CO ₂																						
N ₂																						
CH ₄																						
C ₂ H ₄																						
C ₂ H ₆																						
C ₃ H ₆																						
C ₃ H ₈																						
C ₄ H ₈																						
C ₄ H ₁₀																						
C ₅ H ₁₀																						
C ₆ H ₁₂																						
OIL																						
WATER																						
TOTAL																						
H ₂ +CO																						
H ₂ /CO																						
ULTIMATE YIELDS							WEIGHT BALANCE			EFFLUENT RATIOS		CONTRACTION:										
	%	#/hr	H ₂ / CO		H ₂ / CO		Wet Gas	#/hr	%	#/hr	H ₂ /H ₂ O	C ₀ Conversion:										
	C ₀ Fed		#/MCF	g/M ³	Gal/hr	Gal/MCF	cc/M ³				C ₀ /C ₀	H ₂ Conversion:										
C1+C2								Oil			(H ₂) (C ₀)											
C3+								Water			(H ₂) (C ₀)											
C4+								Total														
Ult. Oil																						
CO ₂																						
H ₂ O																						

Yield Calculations assume "oil" is CH₂, and is found by difference on Carbon, and H₂O 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 CALCULATION and SUMMARY SHEET

Synthesis Run Number 21D From 7/11/47 Hr. 0700 to 7/12/47 Hr. 0700

FRESH FEED								LIQUID YIELDS										CATALYST DATA			
Orsat	Corr. Fac.	Cor. Orsat	M. S.	M. W.	Calc. M. W.	C. N.		Oil Tank #					Water Tank #					In Reactor at Start of Period			
CO ₂		2.0		44	88	38.5		GAUGES, INCHES										276.5			
CO		24.3		28	960			Total	O/W	Oil	Gals.	Corr.	Total Gals.	Gauge	Gals.	Corr.	Total Gals.	Fresh Catalyst Charged			
CH ₄		2.2		16	.35			At End of Period					59.7					Catalyst Recharged			
H ₂		60.3		2	1.21			At Start of Period					26.74					Total			
N ₂		1.2		28	.34			Production					15					Catalyst Taken Out			
Mol. Wt.					12.84			Samples					66					In Reactor at End of Period			
					1.53			Uncorrected Production					71					226.0			
								G. P. H.					2.96					Reactor d-P, H ₂ O			
FLOW CALCULATIONS								TEMPERATURE, °F										Pounds in Reactor			
	Coeff	Chart	Fp	Ft	F m.w.	SCFH	%	G.P.H. at 60°F										241			
Oxygen						1920		A.P.I. at 60°F										646			
Nat. Gas						2320		Pounds Per Hour										19.4			
Total						4250	46.3	RUN CONDITIONS										DISTILLATIONS			
Fresh Feed						7500		Generator Press.					ASTM					WATER			
F. F. by C						7260		O ₂ Preheat, °F					Prod.					Temp. %			
Avg. F. F.								Gas Preheat, °F					A.P.I.					200			
Wet Gas						3520		Reactor Press.					I.B.P.					203			
Contraction							57.5	Steam Back Press.					10%					208			
Recycle						10160		Temperatures, °F					20					Space Vel. SCFH/lb. cat.			
Bleed						352		Heater Outlet					482					Inventory Figures			
Total						10452		Catalyst #1					657					From d-P Meters			
Total Feed						17712		#2					627					30.1			
Recycle/F.F.						144		#3					557								
Inlet Vel.						1.11		#4					556								
Steam Flow						142.5		#5					580								
7.00 → 7.02							25.4	Average					585								
7.00 → 7.04								Product Separator													
WEIGHT BALANCE								PRODUCT INSPECTION										CATALYST ANALYSIS			
In	F. F. = SCFH x MW/379 =					237		Hempel Dist.					Chemicals					Particle Size			
Out	Wet Gas					122		°F					Oil					Screen			
	Oil					194		to 400					Water					Sedimentation			
	Water					535		400-550										Frac. M % M %			
	Loss							550+										On 40 420+ 80+			
	Total					2449	103											100 419-150 80-40			
7.00 → 7.06							211											150 149-105 40-20			
																		200 104-74 20-10			
																		250 73-62 10-0			
																		325 61-44			
																		<325 43-0			
																		Density, lbs./cu. ft. Chem. Anal.			
																		Aerated % Fe			
																		Settled % C			
																		Compacted % Oil			
																		Sp. Grav. Specific Surface m ² /gm			

	FRESH FEED			WET GAS				RECYCLE	COMB. FEED	EFFLUENT	NET CHANGE ON REACTION														
	%	m/hr	#/hr	%	Measured		At Wt. Balance				Carbon			Hydrogen			Oxygen	Ultimate Oil		Unsat.					
CO	76.3	7.18	201.04	12.45	1.16	32.78	1.36	38.08	3.43	10.61	22.40	4.79	11.56	-5.82	-5.82	18.44									
H ₂	58.3	11.54	230.8	54.27	5.04	10.08	5.90	11.80	14.97	26.51	55.98	20.87	50.36	-5.67											
CO ₂	1.5	.30	13.20	16.19	1.50	66.00	1.76	77.44	4.47	4.77	10.07	6.23	15.03	1.46	1.46	20.33									
N ₂	3.1	.61	17.08	2.65	.25	7.00	.29	8.12	.73	1.34	2.83	1.02	2.46	.32											
CH ₄	0.8	.16	9.56	6.29	.58	9.28	.68	10.98	1.73	1.89	3.99	2.41	5.82	.52	.52	7.24	2.04								
C ₂ H ₄				1.77	.16	4.48	.19	5.32	.49	1.49	1.03	1.68	1.64	.19	.38	5.29	.76								
C ₂ H ₆				.90	.08	2.40	.09	2.70	.25	.25	.53	.34	.82	.07	.18	2.51	.36								
C ₃ H ₆				2.18	.20	8.40	.23	9.66	.60	.60	1.27	.83	2.00	.23	.69	9.61	1.38								
C ₃ H ₈				.81	.08	3.52	.09	3.96	.22	.22	.46	.31	.75	.09	.27	3.76	.72								
C ₄ H ₈				1.46	.14	7.84	.16	8.96	.40	.40	.84	.56	1.35	.16	.64	8.91	1.28								
C ₄ H ₁₀				.16	.01	.58	.01	.68	.04	.04	.08	.05	.12	.01	.04	.56	.10								
C ₅ H ₁₀				.68	.06	4.20	.07	4.90	.19	.19	.40	.26	.63	.07	.35	4.87	.10								
C ₆ H ₁₂				.19	.02	1.68	.02	1.97	.05	.05	.11	.07	.17	.02	.12	1.67	.24								
OIL							(16.38)					.12	.29		1.17	16.30	2.34								
WATER												2.90	7.00				1.26								
TOTAL		19.79	236.96		9.29	157.94	10.85	184.47	27.57	47.36	99.99	41.44	100.00	8.94		49.99									
H ₂ +CO		18.72					7.26																		
H ₂ /CO		1.61					4.34		2.50		4.36														

	ULTIMATE YIELDS				WEIGHT BALANCE		#/hr	%	#/hr	EFFLUENT RATIOS		CONTRACTION: 45.2	
	% CO Fed	#/hr	#/MCF	g/M3	Gal/hr	H ₂ /CO				Gal/MCF	cc/M3	H ₂ /H ₂ O	CO ₂ /CO
C1+C2	15.04	16.34	2.30	38.89									
C3+	45.68	46.12	6.50	109.92									
C4+	32.31	32.50	4.58	77.45									
Ult. Oil		40.74	5.75	97.23	4.65	194	132.82						
CO ₂	20.33	64.24	9.06	153.20									
H ₂ O		52.20	7.36	124.46									

Yield Calculations assume "oil" is CH₂, and is found by difference on Carbon, and H₂O 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 x #/MCF. cc/M3 = 141.3 x gal/MCF.

**THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA CALCULATION and SUMMARY SHEET**

Synthesis Run Number 216 From 7/12/47 Hr. 0700 to 7/13/47 Hr. 0700
SHUT DOWN FOR THREE (3) HOURS

FRESH FEED								LIQUID YIELDS												CATALYST DATA			
Orsat	Corr. Fac.	Cor. Orsat	M. S.	M. W.	Calc. M.W.	C. N.		Oil Tank #				Water Tank #				In Reactor at Start of Period							
CO ₂		1.8		44	1.79	39.6		GAUGES, INCHES								226							
CO		35.2		28	8.85		Total	O/W	Oil	Gals.	Corr.	Total	Gauge	Gals.	Corr.	Total	Gals.	Fresh Catalyst Charged					
CH ₄		2.6		16	4.2		At End of Period											Catalyst Recharged					
H ₂		59.1		2	1.18		At Start of Period											Total					
N ₂		1.3		28	1.36		Production											Catalyst Taken Out					
Mol. Wt.					12.60		Samples											In Reactor at End of Period					
					1.57		Uncorrected Production											Reactor d-P, H ₂ O					
							G. P. H.											Pounds in Reactor					
							Temperature, °F											Density, lbs./cu. ft.					
							G.P.H. at 60°F											Bed Height, Feet					
							A.P.I. at 60°F											Space Vel. SCFH/lb. cat.					
							Pounds Per Hour											Inventory Figures					
																		From d-P Meters					
																		CATALYST ANALYSIS					
																		Particle Size					
																		Screen					
																		Sedimentation					
																		Frac. M % M %					
																		On 40 420+ 80+					
																		100 419-150 80-40					
																		150 149-105 40-20					
																		200 104-74 20-10					
																		250 73-62 10-0					
																		325 61-44					
																		<325 43-0					
																		Density, lbs./cu. ft. Chem. Anal.					
																		Aerated % Fe					
																		Settled % C					
																		Compacted % Oil					
																		Sp. Grav. Specific Surface					
																		m ² /gm					

	FRESH FEED			WET GAS				RECYCLE	COMB. FEED	EFFLUENT	NET CHANGE ON REACTION													
	%	m/hr	#/hr	Measured		At Wt. Balance					m/hr	m/hr	%	m/hr	%	Carbon			Hydrogen		Oxygen	Ultimate Oil		Unsat.
				m/hr	#/hr	m/hr	#/hr									m/hr	a/hr	%	a/hr	%	a/hr	%	a/hr	
CO	33.8	6.34	177.52	9.25	1.83	23.24	1.89	24.92	2.58	8.72	17.07	2.47	8.58	-2.75	-5.45	14.04			-5.45					
H ₂	58.4	10.96	21.92	45.56	4.11	8.22	4.70	8.80	12.74	23.70	53.73	12.14	42.57	6.56										
CO ₂	2.5	.47	22.28	16.71	1.07	74.20	1.81	79.07	5.23	5.70	12.20	7.24	17.41	1.34	1.24	21.14								
N ₂	3.1	.58	16.24	1.78	.16	4.48	.17	4.76	.50	1.08	2.31	.07	1.06	-1.41										
CH ₄	2.7	.41	6.56	16.36	1.48	23.08	1.58	25.28	4.57	4.78	10.66	6.15	15.21	1.17	1.17	18.45	4.08							
C ₂ H ₄				1.87	.17	4.76	.18	5.24	.57	.57	1.11	.70	1.13	.18	.56	5.08	.14						57.69	
C ₂ H ₆				1.26	.12	3.00	.13	3.90	.38	.28	.81	.51	1.26	.15	.26	4.10	.18							
C ₃ H ₆				2.26	.19	7.98	.20	8.40	.58	.58	1.24	.78	1.73	.20	.60	7.94	1.20						7.56	
C ₃ H ₈				.57	.05	2.20	.05	2.35	.16	.16	.24	.21	.52	.05	.15	2.27	.12						78.33	
C ₄ H ₈				1.30	.12	6.72	.13	7.28	.36	.36	.77	.49	1.21	.15	.52	8.20	1.04						6.92	
C ₄ H ₁₀				.22	.02	1.16	.02	1.24	.26	.26	.52	.20	.22	.08	1.26	.20							1.24	
C ₅ H ₁₀				.70	.06	4.20	.06	4.49	.20	.20	.43	.26	.64	.06	.20	4.73	.20						4.49	
C ₆ H ₁₂				.29	.03	2.52	.03	2.70	.08	.08	.17	.11	.27	.05	.18	2.84	.26						2.70	
OIL							(6.86)					.05	.12		.47	7.75	.78						6.86	
WATER												2.77	6.85				2.16						2.16	
TOTAL	18.76	242.92		9.02	16.72	9.65	178.80	27.46	46.72	99.99	40.43	99.98	9.11		100.00								29.77	
H ₂ +CO	17.30						5.29																	
H ₂ /CO	1.73						4.94																	

	ULTIMATE YIELDS				WEIGHT BALANCE		#/hr		%		#/hr		EFFLUENT RATIOS		CONTRACTION: 46.6	
	% CO Fed	#/hr	H ₂ /CO #/MCF	g/M ³	Gal/hr	Gal/MCF	cc/M ³	Wet Gas	Oil	Water	Total	H ₂ /H ₂ O	CO ₂ /CO	(H ₂)(CO ₂)(H ₂ O)(CO)	CO Conversion: 85.9	H ₂ Conversion: 59.8
C ₁ +C ₂	28.23	27.66	4.22	71.36				16.71	18.4	46.5	232.0	6.19	2.03	12.57		
C ₃ +	36.59	32.62	4.97	84.04												
C ₄ +	24.76	22.02	3.36	56.82												
Ult. Oil	29.77	4.54	76.77	4.98	.76	107.39										
CO ₂	21.14	58.96	8.99	152.02												
H ₂ O	49.86	7.60	128.52													

Yield Calculations assume "oil" is CH₂, and is found by difference on Carbon, and H₂O 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 CALCULATION and SUMMARY SHEET

Synthesis Run Number 21F From 7/13/47 Hr. 0200 to 7/14/47 Hr. 0200

FRESH FEED								LIQUID YIELDS								CATALYST DATA					
Orsat	Corr. Fac.	Cor. Orsat	M. S.	M. W.	Calc. M.W.	C. N.		Oil Tank #	GAUGES, INCHES			Water Tank #			In Reactor at Start of Period						
CO ₂		2.7		44	118	29.9		Total	O/W	Oil	Gals.	Corr.	Total	Gauge	Gals.	Corr.	Total	208			
CO		54.2		28	95.4			At End of Period						90.74	26.74			Fresh Catalyst Charged			
CH ₄		3.0		16	1.8			At Start of Period	76.74						9.74			Catalyst Recharged			
H ₂		59.0		2	1.18			Production	12.44									Total			
N ₂		1.1		28	1.28			Samples					5.74	1.7		98.0		Catalyst Taken Out			
Mol. Wt.					13.66			Uncorrected Production					5			5		In Reactor at End of Period			
					1.51			G. P. H.					3.8			103.0		Reactor d-P, H ₂ O			
FLOW CALCULATIONS								RUN CONDITIONS								DISTILLATIONS					
	Coeff	Chart	Fp	Ft	F m.w.	SCFH	%	Generator Press.	31.2	ASTM			WATER			Inventory Figures					
Oxygen						1780		O ₂ Preheat, °F	52.9	Prod.		Temp.	%	From d-P Meters							
Nat. Gas						2240		Gas Preheat, °F	770	A.P.I.		200		29.4							
Total						4060	43.9	Reactor Press.	2.79	I.B.P.		203									
Fresh Feed						6850		Steam Back Press.	7.00	10%		208									
F. F. by C						6850		Temperatures, °F													
Avg. F. F.								Heater Outlet	4.7												
Wet Gas						3520		Catalyst #1	6.40												
Contraction							46.7	#2	6.30												
Recycle						10300		#3	3.75												
Bleed						584		#4	5.60												
Total						10638		#5	5.22												
Total Feed						17488		Average	5.79												
Recycle/F.F.						1.15		Product Separator													
Inlet Vel.						1.11															
Steam Flow						102.74															
WEIGHT BALANCE								PRODUCT INSPECTION								CATALYST ANALYSIS					
In	F. F. = SCFH x MW/379 =						22.8	Hempel Dist.				Chem. Anal.									
Out	Wet Gas						16.5	Chemicals				Particle Size									
	Oil						11.4	Oil				Screen									
	Water						35.6	Water				Sedimentation									
	Loss							Loss				Frac. M % M %									
	Total						218.0	550+				On 40 420+ 80+									
												100 419-150 80-40									
												150 149-105 40-20									
												200 104-74 20-10									
												250 73-62 10-0									
												325 61-44									
												<325 43-0									
												Density, lbs./cu. ft.									
												Aerated % Fe									
												Settled % C									
												Compacted % Oil									
												Sp. Grav. Specific Surface									
												m ² /gm									

ORSAT	FRESH FEED		WET GAS				RECYCLE		COMB. FEED		EFFLUENT		NET CHANGE ON REACTION											
	%	m/hr	Measured		At Wt. Balance		m/hr	m/hr	%	m/hr	%	Carbon		Hydrogen		Oxygen	Ultimate Oil		Unsat.					
		#/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	39.2	6.27	175.56	12.41	1.15	32.20	1.25	34.91	3.53	9.80	20.95	4.78	11.72	-5.02	-5.02	19.94								
H ₂	59.0	10.82	216.4	58.83	4.72	9.44	5.12	10.24	14.45	25.27	54.03	19.57	47.98	-5.70		-11.40								
CO ₂	2.7	.50	22.00	19.64	1.82	80.08	1.47	86.83	3.58	6.08	13.00	7.55	18.57	1.47	1.47	23.44								
N ₂	1.1	.20	5.60	1.62	.15	4.20	.16	4.55	.46	.66	1.41	.62	1.52											
CH ₄	3.0	.55	8.80	8.84	.82	13.12	.84	14.23	2.57	3.06	6.54	3.40	8.34	.34	.34	5.42	1.36							
C ₂ H ₄				1.49	.14	3.92	.15	4.25	.42	.42	.90	.67	1.64	.15	.36	4.78	.60							
C ₂ H ₆				1.06	.10	3.00	.11	3.25	.30	.30	.64	.41	1.01	.11	.23	3.57	.66							
C ₃ H ₆				1.68	.16	6.72	.17	7.29	.48	.48	1.03	.65	1.54	.17	.57	8.13	1.02							
C ₃ H ₈				.33	.03	1.32	.03	1.43	.09	.09	.19	.12	.29	.03	.09	1.44	.24							
C ₄ H ₈				1.06	.10	3.60	.11	6.07	.30	.30	.64	.41	1.01	.11	.44	7.02	.88							
C ₄ H ₁₀				.30	.03	1.74	.03	1.89	.09	.09	.19	.12	.29	.03	.12	1.91	.30							
C ₅ H ₁₀				.53	.05	3.50	.05	3.80	.15	.15	.32	.20	.44	.05	.25	3.44	.50							
C ₆ H ₁₂				.23	.02	1.68	.02	1.80	.07	.07	.15	.09	.22	.02	.12	1.91	.24							
OIL								(16.24)				.12	.29		1.16	18.50	2.32							
WATER												2.08	5.10			3.28								
TOTAL		18.34	233.60			9.29	166.48	10.06	180.52	28.43	46.77	99.99	40.74	100.00	9.28	99.99								
H ₂ +CO		17.09						6.37																
H ₂ /CO		1.73						4.10																
ULTIMATE YIELDS		H ₂ /CO		H ₂ /CO		WEIGHT BALANCE		#/hr		% #/hr		EFFLUENT RATIOS		CONTRACTION: 4.51										
% CO Fed		#/hr		#/MCF g/M3		Gal/hr Gal/MCF cc/M3		Wet Gas		166.5 180.6		H ₂ /H ₂ O		C ₀ Conversion: 80.1										
C1+C2		13.71 13.93		1.99 33.65				Oil		17.4 17.4		CO ₂ /CO		H ₂ Conversion: 52.7										
C3+		42.90 38.50		5.94 100.45				Water		35.6 35.6		(H ₂) (CO ₂) (H ₂ O) (CO)		H ₂ = 10 = 58.5										
C4+		32.33 29.78		4.60 77.79				Total		219.5 94.0 233.6														
Ult. Oil		36.04 5.56		94.02 5.91		.91 128.58																		
CO ₂		23.44 64.83		10.00 169.10																				
H ₂ O		37.44 5.78		97.74																				

Yield Calculations assume "oil" is CH₂, and is found by difference on Carbon, and H₂O 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 x #/MCF cc/M³ = 141.3 x gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA CALCULATION and SUMMARY SHEET

Synthesis Run Number 217 From 7/17/47 Hr. 0700 to 7/18/47 Hr. 0700

FRESH FEED								LIQUID YIELDS								CATALYST DATA						
	Orsat	Corr. Fac.	Cor. Orsat	M. S.	M. W.	Calc. M. W.	C. N.		Oil Tank #	GAUGES, INCHES				Water Tank #				In Reactor at Start of Period				
									Total	O/W	Oil	Gals.	Corr.	Total	Gauge	Gals.	Corr.	Total	Fresh Catalyst Charged			
CO ₂			2.1		44	9.9	39.1		At End of Period	55.74					52				Catalyst Recharged			
CO			34.9		28	9.76			At Start of Period	40.34					19.34				Total			
CH ₄			2.1		16	.33			Production	14.34			4.5	69.2	32.14		4.5	148.5	Catalyst Taken Out			
H ₂			54.7		2	1.17			Samples					5					In Reactor at End of Period			
N ₂			1.2		28	.33			Uncorrected Production					74.2				153.5	Reactor d-P, H ₂ O			
Mol. Wt.						12.53			G. P. H.					3.1				6.4	Pounds in Reactor			
						1.53			Temperature, °F					66				70	Density, lbs./cu. ft.			
									G.P.H. at 60°F					3.1				6.4	Bed Height, Feet			
									A.P.I. at 60°F					48.2				10.6				
									Pounds Per Hour					20.3				49.6				
FLOW CALCULATIONS								RUN CONDITIONS				DISTILLATIONS				CATALYST ANALYSIS						
	Coeff	Chart	Fp	Ft	Fm.w.	SCFH	%	Generator Press.	316	ASTM			WATER		Particle Size							
Oxygen						1800		O ₂ Preheat, °F	456	Prod.			Temp.	%	Screen							
Nat. Gas						2380		Gas Preheat, °F	857	A.P.I.			200		Sedimentation							
Total						4150	43.0	Reactor Press.	300	I.B.P.			203		Frac. M % M %							
Fresh Feed						7270		Steam Back Press.	660	10%			208		On 40 420+ 80+							
F. F. by C						7320		Temperatures, °F							100 419-150 80-40							
Avg. F. F.								Heater Outlet	523						150 149-105 40-20							
Wet Gas						1381		Catalyst #1	635						200 104-74 20-10							
Contraction							53.5	Catalyst #2	637						250 73-62 10-0							
Recycle						9550		#3	589						325 61-44							
Bleed						324		#4	584						<325 43-0							
Total						9814		#5	571						Density, lbs./cu. ft.							
Total Feed						17174		Average	592						Chem. Anal.							
Recycle/F.F.						1355		Product Separator		E.P.					Aerated % Fe							
Inlet Vel.						1.07				Res.					Settled % C							
Steam Flow						161.9/66				Loss					Compacted % Oil							
SCFH → 2602						23.4									Sp. Grav.							
CO → 202															Specific Surface m ² /gm							
WEIGHT BALANCE								PRODUCT INSPECTION				PHYSICAL TESTS										
In	F. F. = SCFH x MW/379 =							Hempel Dist.				Chemicals										
Out	Wet Gas							°F % A.P.I.				Oil										
	Oil							to 400				Neut. Sap.										
	Water							400-550				Hydrox. % Fe										
	Loss							550+				% Alc										
	Total																					
SCFH → 202																						

	FRESH FEED				WET GAS				RECYCLE	COMB FEED	EFFLUENT	NET CHANGE ON REACTION											
	%	m/hr	#/hr	%	Measured		At Wt. Balance					Carbon		Hydrogen		Oxygen	Ultimate Oil		Unsat.				
CO	34.0	6.52	182.56	13.76	1.23	34.44	1.59	44.52	3.58	10.10	22.33	5.17	12.75	-4.93	-4.93	24.39							
H ₂	58.5	11.72	22.44	36.32	5.02	10.04	6.48	12.96	14.67	25.84	57.23	21.15	52.16	-4.74									
CO ₂	2.9	.56	24.64	13.79	1.23	54.12	1.59	69.96	3.59	4.15	9.17	5.18	12.77	1.03	1.03	15.80							
N ₂	2.8	.54	15.12	2.49	.22	6.16	.28	7.84	.65	1.19	2.63	.93	2.29	.26									
CH ₄	1.8	.35	5.60	7.47	.67	10.72	.86	13.76	1.95	2.30	5.08	2.81	6.93	.51	.51	1.82	2.04						
C ₂ H ₄				1.34	.12	3.36	.15	4.20	.35	.35	.77	.50	1.23	.15	.30	1.60	.60						67.00
C ₂ H ₆				.66	.06	1.80	.08	2.40	.17	.17	.38	.25	.62	.08	.16	2.45	.48						
C ₃ H ₆				1.64	.15	6.30	.19	7.98	.43	.43	.95	.62	1.53	.19	.57	8.74	1.14						71.8 6.25 1.15 79.23
C ₃ H ₈				.43	.04	1.76	.05	2.20	.11	.11	.24	.16	.39	.05	.15	2.30	.40						
C ₄ H ₈				1.41	.13	7.28	.17	9.52	.37	.37	.82	.54	1.33	.17	.68	10.43	1.36						9.04 6.10 1.48
C ₄ H ₁₀																							
C ₅ H ₁₀				.69	.06	4.20	.08	5.60	.18	.18	.40	.26	.64	.08	.40	6.13	.80						5.60 5.40 1.04
C ₆ H ₁₂																							
OIL								(15.82)				.11	.27		1.13	17.33	2.26						15.82 6.50 2.43
WATER												2.87	7.08										(0.20) 2.87
TOTAL																							37.64 6.10
H ₂ +CO																							
H ₂ /CO																							
ULTIMATE YIELDS				WEIGHT BALANCE				EFFLUENT RATIOS				CONTRACTION: 40.0											
	% CO Fed	#/hr	H ₂ /CO #/MCF	Gal/hr	H ₂ /CO Gal/MCF	cc/M3	Wet Gas	#/hr	%	#/hr	H ₂ /H ₂ O	7.37	C ₀ Conversion: 75.6										
C ₁ +C ₂	14.87	14.76	2.20	37.20			Oil	20.3		20.3	CO ₂ /CO	1.00	H ₂ Conversion: 42.2										
C ₃ +	44.93	41.12	6.12	103.49			Water	49.6		49.6	(H ₂)(CO ₂)(H ₂ O)(CO)	7.41	H ₂ +CO=50.4										
C ₄ +	33.89	30.54	4.60	77.79			Total	210.1	84.0	250.4													
Ult. Oil		37.64	5.60	94.70	6.10	.91																	
CO ₂		15.80	45.32	6.74	113.97																		
H ₂ O			51.66	7.69	130.04																		

Yield Calculations assume "oil" is CH₂, and is found by difference on Carbon, and H₂O 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 CALCULATION and SUMMARY SHEET

Synthesis Run Number 214 From 7/16/47 Hr. 0700 to 7/19/47 Hr. 0700

FRESH FEED								LIQUID YIELDS										CATALYST DATA			
Orsat	Corr. Fac.	Cor. Orsat	M. S.	M. W.	Calc. M.W.	C. N.		Oil Tank #					Water Tank #					In Reactor at Start of Period		359.5	
CO ₂		2.2		44	1.97	27.7		GAUGES INCHES										Fresh Catalyst Charged			
CO		34.5		28	7.65		Total	O/W	Oil	Gals.	Corr.	Total Gals.	Gauge	Gals.	Corr.	Total Gals.	Catalyst Recharged		207.0		
CH ₄		3.0		16	4.8		At End of Period	67.5				61.9					Total		286.5		
H ₂		59.2		2	1.18		At Start of Period	55.5									Catalyst Taken Out		202.0		
N ₂		1.1		28	.31		Production	12.0				52.8	29.34		120.8	In Reactor at End of Period		259.5			
Mol. Wt.					12.57		Samples					5		5		Reactor d-P, H ₂ O		24			
					1.57		Uncorrected Production					37.8		135.8		Pounds in Reactor		259.6			
							G. P. H.					2.41		5.6		Density, lbs./cu. ft.		67.7			
							Temperature, °F									Bed Height, Feet		2.7			
							G.P.H. at 60°F					2.40		5.6							
							A.P.I. at 60°F					4.86		10.8							
							Pounds Per Hour					15.7		46.6							
FLOW CALCULATIONS								RUN CONDITIONS										DISTILLATIONS			
	Coeff	Chart	Fp	Ft	F.m.w.	SCFH	%	Generator Press.	713	ASTM					WATER					Space Vel. SCFH/lb. cat.	
Oxygen						1783		O ₂ Preheat, °F	480	Prod.				Temp.	%	Inventory Figures					
Nat. Gas						2328		Gas Preheat, °F	845	A.P.I.				200		From d-P Meters		28.7			
Total						4111	42.4	Reactor Press.	248	I.B.P.				203							
Fresh Feed						7320		Steam Back Press.	624	10%				208							
F. F. by C						7040		Temperatures, °F		20											
Avg. F. F.						7640		Heater Outlet	467	30											
Wet Gas						9680	50.3	Catalyst #1	407	40											
Contraction						9680		#2	422	50											
Bleed						328		#3	625	60											
Total						10008		#4	285	70											
Total Feed						11048		#5	533	80											
Recycle/F.F.						143		Average	400	90											
Inlet Vel.						1.07		Product Separator		E.P.											
Steam Flow						32.27	16.4			Rec.											
1600 → 60										Res.											
Col → W.S. 216										Loss.											
WEIGHT BALANCE								PRODUCT INSPECTION										PHYSICAL TESTS			
In	F. F. = SCFH x MW/379 =					243		Hempel Dist.		Chemicals											
Out	Wet Gas					151.6		°F	%	A.P.I.	Oil	Water	Product	Pour °F	SUS @ °F	SFS @ °F	Sp. Grav.				
	Oil					15.7		to 400			Neut. #										
	Water					76.6		400-550			Sap.										
	Loss							550+			Hydrox #										
Total						243.7	100.3				% Fe										
1600 → 60											% Alc										

	FRESH FEED				WET GAS				RECYCLE	COMB. FEED	EFFLUENT		NET CHANGE ON REACTION											
	%	m/hr	#/hr		Measured	At Wt. Balance					m/hr	%	m/hr	%	Carbon			Hydrogen		Oxygen	Ultimate Oil		Unsat.	
					m/hr	#/hr	m/hr	#/hr						m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%	
CO	30.4	5.87	164.36	16.41	1.58	44.24	1.55	46.40	4.33	10.20	22.21	5.88	15.42	-4.32	-4.32	26.41			-4.32					
H ₂	62.5	12.07	241.4	50.87	4.88	9.16	4.78	9.56	13.43	25.50	55.79	16.21	41.76	-7.29					-14.58					
CO ₂	1.8	.35	15.40	15.15	1.45	63.80	1.42	62.48	4.00	4.35	9.52	5.42	14.21	1.07	1.07	14.23							2.14	
N ₂	1.3	.25	7.00	1.43	.14	2.42	.14	2.24	.38	.63	1.38	.52	1.36	- .11										
CH ₄	4.0	.77	12.32	9.66	.93	14.88	.91	14.56	2.55	2.32	7.26	2.46	9.07	.14	.14	2.39	.56							
C ₂ H ₄				1.43	.14	2.42	.14	2.24	.38	.38	1.38	.52	1.36	.14	.28	4.17	.56							64.13
C ₂ H ₆				.80	.08	2.40	.08	2.35	.21	.21	4.6	.29	.76	.08	.16	2.73	1.48							
C ₃ H ₆				1.72	.17	7.14	.17	7.00	1.45	.45	9.8	.62	1.63	.17	.51	4.67	1.62							6.30 6.25 1.01 28.90
C ₃ H ₈				.46	.04	1.76	.04	1.72	.12	.12	.26	.16	1.42	.04	.12	2.04	.22							
C ₄ H ₈				1.43	.14	7.84	.14	7.68	.38	.38	1.83	.52	1.36	.14	.56	9.54	1.12							7.30 6.10 1.20
C ₄ H ₁₀																								
C ₅ H ₁₀				.63	.06	4.20	.06	4.12	.17	.17	.37	.23	.60	.06	.30	5.11	.60							4.12 5.40 .76
C ₆ H ₁₂																								
OIL								(16.52)				.12	.31		1.18	20.10	2.36							16.52 6.50 2.54
WATER												2.18	5.72				7.56							2.18
TOTAL	19.31	223.2		9.60	163.9	9.42	160.55	26.40	45.71	99.99	38.13	94.8	9.88		100.01									24.24 5.51
H ₂ +CO	17.94						6.33																	
H ₂ /CO	2.06						3.08				2.50		3.10											
ULTIMATE YIELDS								WEIGHT BALANCE				EFFLUENT RATIOS		CONTRACTION: 57.2										
	%	#/hr		H ₂ /CO				Wet Gas	#/hr	%	#/hr	H ₂ /H ₂ O		C ₀ Conversion:										
C ₁ +C ₂	9.89	8.56	1.26	21.31				163.9			160.9	8.35		73.6										
C ₃ +	45.48	37.46	5.57	93.17				15.7			15.7	.92		H ₂ Conversion:										
C ₄ +	24.75	28.56	4.20	71.02				46.6			46.6	(H ₂)(CO ₂)												
Ult. Oil		34.24	5.04	85.23	5.51	.81	114.45					(H ₂)(CO)	7.71											
CO ₂	18.23	47.08	6.92	117.02																				
H ₂ O		39.24	5.77	97.57																				

Yield Calculations assume "oil" is CH₂, and is found by difference on Carbon, and H₂O 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 x #/MCF. cc/M³ = 141.3 x gal/MCF.

**THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA CALCULATION and SUMMARY SHEET**

Synthesis Run Number 211 From 7/19/47 Hr. 0700 to 7/20/47 Hr. 0700

FRESH FEED								LIQUID YIELDS										CATALYST DATA			
Orsat	Corr. Fac.	Cor. Orsat	M. S.	M. W.	Calc. M.W.	C. N.		OIL TANK #					WATER TANK #					In Reactor at Start of Period			
CO ₂		2.1		44	.95	99.7		GAUGES, INCHES								359.5					
CO		34.6		28	9.68			Total	O/W	Oil	Gals.	Corr.	Total Gals.	Gauge	Gals.	Corr.	Total Gals.	Fresh Catalyst Charged	99.0		
CH ₄		3.0		16	.48			At End of Period						91.74	2.3			Catalyst Recharged			
H ₂		59.0		2	1.18			At Start of Period						80.74	4			Total	458.5		
N ₂		1.3		28	.36			Production					38.5	10	19		12.75	Catalyst Taken Out	107.0		
Mol. Wt.					12.63			Samples					5					In Reactor at End of Period	357.5		
					1.52			Uncorrected Production					43.5				13.25	Reactor d-P, H ₂ O	1.5		
FLOW CALCULATIONS								RUN CONDITIONS										DISTILLATIONS			
	Coef	Chart	Fp	Ft	F m.w.	SCFH	%	Generator Press.	313	ASTM			WATER		Space Vel. SCFH/lb. cat.						
Oxygen						1795		O ₂ Preheat, °F	523	Prod.		Temp.	%	Inventory Figures							
Nat. Gas						2320		Gas Preheat, °F	829	A.P.I.		200		From d-P Meters				445			
Total						4115	436	Reactor Press.	299	I.B.P.		203		CATALYST ANALYSIS							
Fresh Feed						7550		Steam Back Press.	707	10%		208		Particle Size							
F. F. by C						7020		Temperatures, °F	20					Screen							
Avg. F. F.						4170		Heater Outlet	494	30				Sedimentation							
Wet Gas								Catalyst #1	673	40				Frac.	M	%	M	%			
Recycle						10130	40.7	#2	651	50				On 40	420+		80+				
Bleed						344		#3	575	60				100	419-150		80-40				
Total						10414		#4	588	70				150	149-105		40-20				
Total Feed						17494		#5	534	80				200	104-74		20-10				
Recycle/F.F.						1.47		Average	604	90				250	73-62		10-0				
Inlet Vel.						1.14		Product Separator		E.P.				325	61-44						
Steam Flow						71.8	46			Res.				<325	43-0						
7600 → 7020						23.4				Loss.				Density, lbs./cu. ft.				Chem. Anal.			
WEIGHT BALANCE								PRODUCT INSPECTION										PHYSICAL TESTS			
In	F. F. = SCFH x MW/379 =					252		Hempel Dist.		Chemicals											
Out	Wet Gas					203		°F	%	A.P.I.	Oil	Water		Product	Pour °F	SUS @ °F	SFS @ °F	Compacted	% Oil		
	Oil					11.9		to 400			Neut. #							Aerated	% Fe		
	Water					45.7		400-550			Sop. #							Settled	% C		
	Loss							550+			Hydrox. #							Sp. Grav.	Specific Surface		
	Total					200.6	103.3				% Fe								m ² /gm		
7600 → 7020											% Alc										

	FRESH FEED				WET GAS				RECYCLE	COMB. FEED	EFFLUENT	NET CHANGE ON REACTION													
	%	m/hr	#/hr	%	Measured		At Wt. Balance					m/hr	m/hr	%	m/hr	%	Carbon		Hydrogen		Oxygen		Ultimate Oil		Unsat.
					m/hr	#/hr	m/hr	#/hr									m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	
CO	32.9	6.55	182.40	11.47	1.26	352.8	1.76	49.28	3.17	9.72	20.84	4.93	11.18	-4.19	-4.19	26.87									
H ₂	57.3	11.41	22.82	62.25	6.85	12.70	9.59	19.18	17.21	28.62	61.36	26.80	60.19	-1.82		-3.64									
CO ₂	2.9	.58	25.52	12.75	1.40	61.60	1.96	56.24	3.52	4.10	9.79	5.48	12.43	1.38	1.38	21.07							3.76		
N ₂	4.8	.96	26.88																						
CH ₄	2.2	.44	7.04	8.71	.86	15.36	1.24	21.44	2.41	2.85	6.11	3.25	9.57	.90	.90	13.74	3.60								
C ₂ H ₄				1.14	.13	3.64	.18	5.04	.32	.32	.69	.50	1.13	.18	.36	5.50	.72						66.67		
C ₂ H ₆				.57	.06	1.80	.08	2.40	.16	.16	.34	.24	.54	.08	.16	2.44	.48								
C ₃ H ₆				1.21	.13	5.46	.18	7.56	.33	.33	.71	.51	1.16	.18	.54	8.24	1.08						6.80 6.25 1.09 93.21		
C ₃ H ₈				.21	.02	.88	.03	1.32	.06	.06	.13	.09	.20	.03	.09	1.37	.24								
C ₄ H ₈				1.14	.13	7.28	.18	10.08	.32	.32	.69	.50	1.13	.18	.72	10.99	1.44						9.58 6.10 1.57		
C ₄ H ₁₀																									
C ₅ H ₁₀				.57	.06	4.20	.08	5.60	.16	.16	.34	.24	.54	.08	.40	6.11	.80						5.60 5.40 1.04		
C ₆ H ₁₂																									
OIL								(3.36)				1.02	2.34		.24	3.66	.48						3.36 6.50 .52		
WATER																							1.03		
TOTAL	19.93	265.7		11.00	149.2	15.38	208.14	27.66	46.64	100.00	44.09	99.44	3.60		99.99								25.34 4.22		
H ₂ +CO	17.96						11.35																		
H ₂ /CO	1.74						5.45				2.94	5.44													
ULTIMATE YIELDS				WEIGHT BALANCE				EFFLUENT RATIOS				CONTRACTION: 18.1													
	% CO Fed	#/hr	H ₂ /CO #/MCF	g/M3	Gal/hr	H ₂ /CO Gal/MCF	cc/M3	Wet Gas	#/hr	%	#/hr	H ₂ /H ₂ O	26.02	CO Conversion: 73.1											
C1+C2	21.68	21.84	3.21	54.28				Oil	11.9		11.9	CO ₂ /CO	1.11	H ₂ Conversion: 15.9											
C3+	30.37	27.92	4.10	69.33				Water	45.7		45.7	(H ₂)(CO ₂)(H ₂)(CO)	28.80	H ₂ +CO = 33.2											
C4+	20.76	19.04	2.80	47.35				Total	206.8	77.7	265.7														
Ult. Oil		25.34	3.72	62.91	4.22	.62	87.61																		
CO ₂	21.07	60.72	8.92	150.84																					
H ₂ O	18.54	2.72	46.00																						

Yield Calculations assume "oil" is CH₂, and is found by difference on Carbon, and H₂O 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 x #/MCF. cc/M3 = 141.3 x gal/MCF.

**THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA CALCULATION and SUMMARY SHEET**

Synthesis Run Number 21M From 7/20/47 Hr. 0700 to 7/21/47 Hr. 0700

FRESH FEED								LIQUID YIELDS										CATALYST DATA						
Orsat	Corr. Fac.	Cor. Orsat	M. S.	M. W.	Calc. M.W.	C. N.		Oil Tank #					Water Tank #					In Reactor at Start of Period						
CO ₂		2.4		44	1.06	405		GAUGES, INCHES										557.5						
CO		84.5		28	9.65			Total	O/W	Oil	Gals.	Corr.	Total	Gauge	Gals.	Corr.	Total	Fresh Catalyst Charged						
CH ₄		2.6		16	.57			At End of Period						43				161.0						
H ₂		57.8		2	1.15			At Start of Period						83				Catalyst Recharged						
N ₂		1.7		28	.47			Production						834			38.5	20	45	92.5	Total			
Mol. Wt.								Samples						5			5	Catalyst Taken Out						
								Uncorrected Production						43.5			97.5	In Reactor at End of Period						
								G. P. H.						1.8			4.05	Reactor d-P, H ₂ O						
								Temperature, °F						6.8			7.2	Pounds in Reactor						
								G.P.H. at 60°F						1.8			4.04	Density, lbs./cu. ft.						
								A.P.I. at 60°F						45.5			10.5	Bed Height, Feet						
								Pounds Per Hour						13.0			33.4							

FLOW CALCULATIONS								RUN CONDITIONS										DISTILLATIONS									
Coeff	Chart	Fp	Ft	F m.w.	SCFH	%		Generator Press.	Q ₂ Preheat, °F	Gas Preheat, °F	Reactor Press.	Steam Back Press.	Temperatures, °F	Heater Outlet	Catalyst #1	#2	#3	#4	#5	Average	Product Separator	Prod.	ASTM	Temp.	%	Space Vel. SCFH/lb. cat.	
Oxygen					1440			317	575	810	292	870	20	571	670	621	583	535	527	593							Inventory Figures
Nat. Gas					1840								30														From d-P Meters
Total					3280	44.0							40														47.9
Fresh Feed					5800								20														
F. F. by C					5460								30														
Avg. F. F.													40														
Wet Gas					2840								50														
Contraction						49.4							60														
Recycle					8500								70														
Bleed					298								80														
Total					8798								90														
Total Feed					14258								90														
Recycle/F.F.					161								E.P.														
Inlet Vel.					1.10								Rec.														
Steam Flow					26.5								Res.														
700 → 62																											
62 → W.C. 12.6																											

WEIGHT BALANCE								PRODUCT INSPECTION										PHYSICAL TESTS									
In	F. F. = SCFH x MW/379 =	Wet Gas	Oil	Water	Loss	Total		Hempel Dist.	Chemicals	Loss.	°F	%	A.P.I.	Oil	Water	Product	Pour °F	SUS @ °F	SFS @ °F	Sp. Grav.	Specific Surface	Compacted	% Fe	% C	% Oil		
	190	139	12	33.4		184.4	97.0				to 400		Neut. Sap.														
											400-550		Hydrox														
											550+		% Fe														
													% Alc														

ORSAT								MAKE GAS										NET CHANGE ON REACTION										
ORSAT	%	m/hr	#/hr	%	Measured	At Wt. Balance	RECYCLE	COMB. FEED	EFFLUENT	Carbon				Hydrogen				Oxygen	Ultimate Oil	Unsat.								
CO	34.5	5.10	142.80	11.31	85	28.80	2.69	7.79	20.19	3.64	10.60	-4.11	-4.11	19.41														
H ₂	57.8	8.54	170.8	52.45	3.93	1.86	4.60	7.19	12.48	31.02	54.48	17.08	44.21	-3.94														
CO ₂	2.4	.35	15.40	15.82	1.18	51.82	1.22	60.72	3.77	41.2	10.68	5.15	14.84	1.03	1.03	20.30												
N ₂	1.7	.25	7.00	4.07	.30	8.40	.35	9.82	.97	1.22	3.16	1.32	3.80	.10														
CH ₄	2.6	.54	8.64	10.35	.78	12.48	.91	14.59	2.46	3.00	7.78	3.37	9.71	.37	.37	7.25	1.41											
C ₂ H ₄				1.49	.11	3.08	.13	3.60	.35	.35	.91	1.48	1.38	.13	.13	2.6	5.10	.27										
C ₂ H ₆				.53	.04	1.20	.05	1.40	.13	.13	.74	.18	.52	.05	.10	1.96	.30											
C ₃ H ₆				1.46	.11	4.62	.13	5.40	.35	.35	.91	1.48	1.38	.13	.37	7.65	.18											
C ₃ H ₈				.40	.03	1.20	.04	1.40	.10	.10	.26	.14	.40	.04	.12	2.35	.32											
C ₄ H ₈				1.09	.08	4.48	.09	5.24	.26	.26	.67	.35	1.01	.09	.36	7.06	.72											
C ₄ H ₁₀				.16	.01	.58	.01	.68	.04	.04	.10	.05	.14	.01	.04	.78	.10											
C ₅ H ₁₀				.59	.04	2.80	.05	3.27	.14	.14	.36	.19	.55	.05	.25	4.90	.50											
C ₆ H ₁₂				.25	.02	1.68	.02	1.96	.06	.06	.16	.08	.23	.02	.12	2.35	.24											
OIL							(14.98)					.11	.32		1.07	20.98	2.14											
WATER												2.05	5.71			.78												
TOTAL		14.78	140.92		7.49	124.10	8.75	145.10	23.80	38.58	100.00	34.71	100.00	6.03	94.99													
H ₂ +CO		13.64						5.59																				
H ₂ /CO		1.67						4.65																				

Yield Calculations assume "oil" is CH₂ and is found by difference on Carbon, and H₂O 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 x #/MCF. cc/M3 = 141.3 x gal/MCF.

**THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA CALCULATION AND SUMMARY SHEET**

Synthesis Run Number 211 From 7/21/47 Hr. 0700 to 7/22/47 Hr. 0700

FRESH FEED								LIQUID YIELDS										CATALYST DATA			
Orsat	Corr. Fac.	Cor. Orsat	M. S.	M. W.	Calc. M.W.	C. N.		Oil Tank #					Water Tank #					In Reactor at Start of Period			
CO ₂			2.3	44	1.01	40.8		GAUGES, INCHES										347.1			
CO			24.3	28	9.60		Total	O/W	Oil	Gals.	Corr.	Total	Gauge	Gals.	Corr.	Total	Fresh Catalyst Charged				
CH ₄			4.2	16	1.67		At End of Period									105.5					
H ₂			57.0	2	1.16		At Start of Period									Catalyst Recharged					
N ₂			1.2	28	.34		Production									Total					
Mol. Wt.					18.78		Samples									Catalyst Taken Out					
					1.51		Uncorrected Production									In Reactor at End of Period					
							G. P. H.									Reactor d-P, H ₂ O					
							Temperature, °F									7					
							G.P.H. at 60°F									Pounds in Reactor					
							A.P.I. at 60°F									72.9					
							Pounds Per Hour									Density, lbs./cu. ft.					
																16.8					
																Bed Height, Feet					
																Space Vel. SCFH/lb. cat.					
																Inventory Figures					
																From d-P Meters					
																77.3					

FLOW CALCULATIONS								RUN CONDITIONS										DISTILLATIONS				CATALYST ANALYSIS			
	Coeff	Chart	Fp	Ft	F.m.w.	SCFH	%	Generator Press.	ASTM					WATER					Particle Size						
Oxygen						1470		O ₂ Preheat, °F						Temp. %					Screen						
Nat. Gas						1820		Gas Preheat, °F						I.B.P.					Sedimentation						
Total						3290	44.8	Reactor Press.						203					Frac. M % M %						
Fresh Feed						5830		Steam Back Press.						208					On 40 420+ 80+						
F. F. by C						5400		Temperatures, °F											100 419-150 80-40						
Avg. F. F.						3040		Heater Outlet											150 149-105 40-20						
Wet Gas						3040		Catalyst #1											200 104-74 20-10						
Contraction							46.0	#2											250 73-62 10-0						
Recycle						8500		#3											325 61-44						
Bleed						332		#4											<325 43-0						
Total						8832		#5											Density, lbs./cu. ft.						
Total Feed						14232		Average											Chem. Anal.						
Recycle/F.F.						1.64		Product Separator											Aerated % Fe						
Inlet Vel.						1.09													Settled % C						
Steam Flow						72.5	46.0												Compacted % Oil						
7/20 → 7/21						16.4													Sp. Grav. Specific Surface						
7/20 → 7/21						14.6													m ² /gm						

	FRESH FEED				WET GAS				RECYCLE	COMB. FEED	EFFLUENT	NET CHANGE ON REACTION														
	%	m/hr	#/hr	%	Measured	At Wt. Balance	m/hr	#/hr				m/hr	%	m/hr	%	Carbon			Hydrogen		Oxygen	Ultimate Oil		Unsat.		
					m/hr	#/hr	m/hr	#/hr								m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%	
CO	33.9	5.03	140.84	16.72	1.34	37.52	1.61	45.08	3.90	8.93	23.41	5.57	10.72	3.42	-3.42	24.01										
H ₂	57.2	8.49	16.98	57.40	4.12	8.24	4.44	9.88	11.98	20.47	52.67	16.72	46.90	-4.55												
CO ₂	2.2	.31	13.64	12.50	1.00	44.00	1.20	52.80	2.41	3.22	8.44	4.11	11.88	.87	.87	17.69										
N ₂	4.1	.61	17.08	4.22	.34	9.02	.41	11.48	.48	1.59	4.17	1.34	4.03	-1.20												
CH ₄	2.6	.39	6.24	9.00	.72	11.52	.86	13.76	2.10	3.49	6.53	2.86	8.55	.47	.47	9.34	1.58									
C ₂ H ₄					1.15	.09	2.52	.11	3.08	.27	.27	.21	.38	1.10	.11	.23	4.37	1.44							32.76	
C ₂ H ₆					2.36	.19	5.70	.23	6.40	.55	.55	1.44	.78	2.25	.23	.46	9.15	1.38								
C ₃ H ₆					1.15	.09	3.78	.11	4.62	.27	.27	.71	.38	1.10	.11	.22	6.56	.66							4.16 6.25 167 95.04	
C ₃ H ₈					.06				.01	.01	.03	.01	.03													
C ₄ H ₈					.90	.07	3.92	.08	4.48	.21	.21	.55	.29	.84	.08	.32	6.36	.64							4.26 6.10 170 84.91	
C ₄ H ₁₀					.16	.01	.58	.01	.70	.04	.04	.10	.05	.14	.01	.04	.80	.10							.70 4.86 .14	
C ₅ H ₁₀					.140	.03	3.10	.04	3.50	.09	.09	.24	.13	.38	.04	.20	3.88	.40							2.80 5.40 .52	
C ₆ H ₁₂																										
OIL								(6.86)				.05	.14		.49	9.74	.88								6.86 6.50 1.06	
WATER												1.64	4.74				2.62								(1.37) 16.4	
TOTAL		14.85	194.78		8.02	129.4	9.60	155.58	23.31	38.14	100.00	34.60	99.99	6.23		100.00									18.78 3.09	
H ₂ +CO		13.52						6.55																		
H ₂ /CO		1.69						3.07																		

	ULTIMATE YIELDS				WEIGHT BALANCE				EFFLUENT RATIOS				CONTRACTION: 41.9			
	% CO Fed	#/hr	H ₂ /CO #/MCF	g/M ³	Gal/hr	H ₂ /CO Gal/MCF	cc/M ³	Wet Gas	#/hr	%	#/hr	H ₂ /H ₂ O	CO ₂ /CO	(H ₂)(CO ₂)(H ₂ O)(CO)	CO Conversion:	H ₂ Conversion:
C ₁ +C ₂	22.86	17.50	3.42	57.83				129.4	155.4			10.32	1.75	7.72	67.9	53.6
C ₃ +	27.44	19.34	3.78	63.92				6.7	6.7							
C ₄ +	20.88	14.72	2.88	48.70				32.7	32.7							
Ult. Oil		18.78	3.67	62.06	3.09	.60	84.78	168.8	86.6	194.8						
CO ₂	17.69	39.16	7.65	129.36												
H ₂ O		28.52	5.77	97.57												

Yield Calculations assume "oil" is CH₂, and is found by difference on Carbon, and H₂O 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.