

THE TEXAS COMPANY — MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 62-I
HOURS 182-206
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FRESH, EFFLUENT, NET CHANGE, YIELD BASIS H2 + CO FED. Rows include CO, H2, CO2, N2, CH4, C2H4, C2H6, C3H8, C4H10, C4H12, C5H12, C6H14, C7H16, C8H18, C9H20, C10H22, C11H24, C12H26, C13H28, C14H30, C15H32, C16H34, C17H36, C18H38, C19H40, C20H42, C21H44, C22H46, C23H48, C24H50, C25H52, C26H54, C27H56, C28H58, C29H60, C30H62, C31H64, C32H66, C33H68, C34H70, C35H72, C36H74, C37H76, C38H78, C39H80, C40H82, C41H84, C42H86, C43H88, C44H90, C45H92, C46H94, C47H96, C48H98, C49H100, C50H102.

Form ML-11

k/NCM = 16.91 X #/MCF *9488 MCFH H2 + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA SUMMARY

RUN NO. 62-I
HOURS 182-206

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include Pressures (Oxygen, Natural Gas, Generator Outlet, Reactor Inlet, Condenser Inlet, Product Accumulator), Temperatures (Oxygen, Natural Gas, Generator, Quench Accumulator, Reactor Inlet, Condenser Inlet, Product Accumulator, Catalyst No.), and Catalyst Data (Inventory, Bed Depth, Vol., Fe, C, O, H, K2O, W+, X-Ray Analysis).

THE TEXAS COMPANY — MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 62-J
HOURS 206-230
CATALYST Fresh CM4S

FRESH FEED				WET GAS			RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H ₂ + CO FED										
	%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE			YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*							
					m/hr	#/hr						#/MCF	#/gal	gal/hr	gal/MCF		CONTRACTED HEMPL. %	gal/hr	TREATING RECOVERY %	gal/hr		
CO 18.010	37.244	15.408	431.57	15.637	2.435	68.20	6.711	22.119	9.146	-12.973	-363.37											
H ₂ 24.016	60.270	24.933	50.26	46.990	7.609	15.35	20.969	45.902	28.578	-17.324	-34.91						400 EP	72.2	7.311	98.0	7.165	
CO ₂ 24.010	1.953	0.808	35.56	23.190	3.757	185.37	10.348	11.156	14.105	2.949	129.81	8.479					400-550	16.0	1.620	91.4	1.481	
N ₂ 28.016	0.210	0.097	2.44	1.233	0.200	5.60	0.550	0.637	0.750								550 +	11.8	1.195	114.6	1.369	
CH ₄ 16.042	0.323	0.134	2.15	6.094	0.987	15.83	2.720	2.854	3.707	0.853	13.68	0.894										
C ₂ H ₆ 30.028				1.573	0.255	7.15	0.702	0.702	0.957	0.255	7.15	0.467						RECOVERY %	#/hr	gal/hr		
C ₃ H ₈ 30.028				0.907	0.147	4.42	0.405	0.405	0.552	0.147	4.42	0.289						PROPYLENE	35.9	4.02		
C ₄ +C ₅											25.25	1.650						C ₃ POLY GASO.	87.5	3.52	0.467	
C ₆ H ₆ 42.073				1.643	0.266	11.19	0.733	0.833	0.999	0.266	11.19	0.731	4.32	2.590	0.169			C ₂ POLY TAR	12.5	0.50	0.060	
C ₇ H ₈ 44.094				0.237	0.038	1.68	0.106	0.106	0.144	0.038	1.68	0.110	4.24	0.396	0.026							
C ₈ H ₈ 54.064				1.483	0.240	13.46	0.662	0.662	0.902	0.240	13.46	0.979	5.00	2.692	0.176				#/gal	#/hr	gal/hr	RVP
C ₉ H ₁₀ 58.120				0.497	0.080	4.65	0.222	0.222	0.302	0.080	4.65	0.304	4.88	0.957	0.063			C ₄ H ₆	5.00	0.27	0.054	68.0
C ₁₀ H ₁₂ 70.130				0.723	0.117	8.21	0.323	0.323	0.440	0.117	8.21	0.536	5.48	1.506	0.098			C ₄ POLY GASO.	5.98	11.54	1.950	1.5
C ₁₁ H ₁₄ 72.146				0.120	0.019	1.37	0.054	0.054	0.073	0.019	1.37	0.089	5.25	0.261	0.017			C ₄ H ₁₀	4.86	4.65	0.957	68.0
C ₁₂ H ₁₈ 84.156				0.273	0.044	3.70	0.122	0.122	0.166	0.044	3.70	0.242	5.94	0.668	0.044			C ₄ -FREE GASO.			10.067	5.8
C ₃ -C ₆											44.26	2.891		9.070	0.593			C ₄ POLY TAR	7.53	1.65	0.219	
TOTAL		41.370	521.98		16.194	326.18	44.627	85.997	68.028													
H ₂ +CO	97.514	40.341	15309.698	10.044			27.680	68.021	37.724	-30.297									gal/hr	gal/MCF	Bbl/Day	
H ₂ /CO		1.62	Factor	653180	3.12		3.12	2.08	3.12	1.34								10 # RVP 400 EP GASOLINE	13.008	0.8497	4607	
Weight Recovery, %	95.23	Catalyst Age, hrs.		Space Velocity, v/hv		1228	RECOVERED OIL		0.470	65.89	4.304	10.126	0.661	GAS OIL		1.481	0.0967	524				
Pressure, psig	417	Inlet Velocity, Ft./sec		1.01	Catalyst Vol CF		12.47	TOTAL OIL		110.15	7.195	19.196	1.254	FUEL OIL		1.369	0.0894	485				
Temperature, °F	660	Bed Depth, Ft		18.89	Weight, #		1596	WATER SOLUBLE CHEMICALS		0.244	12.94	0.845	1.612	0.105	POLY TAR		0.285	0.0186	101			
Recycle Ratio	1.08	Bed Density, #/CF		128	Effluent (H ₂)/(CO) = Shift Ratio (H ₂ O)/(CO)			TOTAL LIQUID PRODUCTS C ₃ +		125.09	8.040	20.808	1.359	TOTAL		16.143	1.0544	5717				
FRESH FEED CONVERSION - %				TOTAL FEED CONVERSION - %				SELECTIVITY		NET WATER		6.493	116.97	7.640	W. S. CHEM.		1.612	0.1053	571			
Contraction	CO	H ₂	H ₂ +CO	CO	H ₂	CO+H ₂	C ₃ + / C ₁ +	GROSS WATER		129.91	8.485	15.654	1.022	TOTAL		17.755	1.597	6288				
60.86	84.20	69.48	75.10	58.65	37.74	44.54	82.98	HYDROCARBON TOTAL - C ₁ +		148.34	9.690											

Form ML-11

g/NCM = 16.91 x # / MCF *9488 MCFH H₂ + CO, Bbl/Day = 5421.6 x gal / MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA SUMMARY

RUN NO. 62-J
HOURS 206-230

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA			
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE	
Oxygen	444	Fresh Feed	15700	°API	49.4	10.5		In Reactor at Start of Period		Screen Analysis	
Natural Gas	440	Recycle	16936	Neut. No.	38.6	38.1		Fresh Catalyst Added	0	Mesh	Microns %
Generator Outlet	422	Combined Feed	32636	Sap. No.	48.4	40.5		Total		On 40	419+
Reactor Inlet	417	Wet Gas—Measured	5676	Hydrox. No.				Catalyst Recovered	63.5	100	150
Condenser Inlet		Adjusted	6145	Bromine No.	86			In Reactor at End of Period		150	105
Product Accumulator	373	Loss	469	Pour °F.						200	74
				Chemicals, % by K ₂ CO ₃		10.3		REACTOR 4-p, Inches H ₂ O		250	62
								No. Height		325	44
TEMPERATURES—°F.		Recycle/Fresh Feed	1.08					0 See Per. A	46	<325	
Oxygen	465	Inlet Velocity—ft./sec.	1.01					1	66	CATALYST	
Natural Gas	815	Fresh Feed Rate—S.C.F.H.	15310	HEMPEL DIST. %		°API		2	70	Bulk Density, Lbs./Cu.Ft.	
Generator	2377	per Cu. Ft. Dense Bed	1228	205 °F.				3	58	Aerated	
Quench Accumulator	144	per Lb. Catalyst	9.59	400	71.2	55.3		4	225	Settled	
Reactor Inlet	400	per Sq. Ft.	23197	400-550	16.0	37.3		Total	465	Compacted	
Condenser Inlet	589			550+	12.8					Particle Density, gm./cc.	
Product Accumulator	91									CALCULATED FROM dp	
Catalyst No.	Height			A. S. T. M. DIST. ON				Density, Lbs./Cu.Ft.	128	NH ₃ Value, ml./gm.	
1	See Per. A	643		Naphtha °F.				Inventory, Lbs.	1596	N ₂ Surface, m ² /gm.	
2	661			IBP		116		Bed Depth, Ft.	18.89	CHEMICAL ANALYSIS	
3	652			10%		146		Vol., Cu. Ft.	12.47	Fe	
4	660			50%		244				C	
5	665			90%		360				O	
6	665			EP		406				H	
7	655			Rec.		97.0				K ₂ O, W+., % basis Fe	
8	641									X-Ray Analysis—	
9	637									Fe ₂ O ₃	
10	638									Fe ₃ O ₄	
11	625									Fe	

THE TEXAS COMPANY - MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 62-K
HOURS 230-254
CATALYST

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2 + CO FED. Rows include CO, H2, CO2, N2, CH4, C2H4, C2H6, C3H8, C4H10, C4H8, C4H6, C4H2, C3-C4, TOTAL, H2+CO, H2/CO, Weight Recovery, Pressure, Temperature, Recycle Ratio, FRESH FEED CONVERSION, Contraction, etc.

Form ML-11

g/NCM = 16.91 x gal/MCF *9488 MCFH H2 + CO, Bbl/Day = 5421.6 x gal/MCF

THE TEXAS COMPANY - MONTEBELLO LABORATORY
DATA SUMMARY

RUN NO. 62-K
HOURS 230-254

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include Pressures, Temperatures, Catalyst No., Height, Inventory, Bed Depth, Vol., Fe, C, O, H, K2O, W+, X-Ray Analysis, Fe2O3, Fe.

THE TEXAS COMPANY — MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 62-L
HOURS 254-279
CATALYST Fresh CM&S

FRESH FEED				WET GAS			RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H ₂ + CO FED									
%	m/hr	#/hr	%	At. Wt.	Balance	m/hr	m/hr	m/hr	m/hr	#/hr	#/MCF	#/gal	gal/hr	gal/MCF	YIELDS	BASIS	BROWNSVILLE	DESIGN	FEED RATE*		
				m/hr	#/hr																
CO _{29.010}	37.277	15.416	431.77	15.995	2.744	76.85	7.176	22.592	9.920	-12.672	-354.92										
H ₂ _{2.016}	60.267	24.922	50.24	48.235	8.274	16.68	21.640	46.562	29.914	-16.648	-35.56				400 EP	70.0	6.666	98.0	6.533		
CO ₂ _{44.010}	2.023	0.837	36.84	22.590	3.875	170.50	10.135	10.972	14.010	3.038	133.66	8.731			400-550	19.2	1.829	91.4	1.672		
N ₂ _{29.016}	0.150	0.062	1.74	1.005	0.172	4.82	0.451	0.513	0.623						550 +	10.8	1.029	114.6	1.179		
CH ₄ _{16.042}	0.285	0.117	1.88	5.610	0.962	15.43	2.517	2.634	3.479	0.245	13.55	0.885									
C ₂ H ₆ _{28.032}				1.570	0.269	7.55	0.704	0.704	0.973	0.269	7.55	0.493									
C ₃ H ₈ _{30.068}				0.885	0.152	4.57	0.397	0.397	0.549	0.152	4.57	0.299			PROPYLENE	33.9	1.93				
C ₄ +C ₅											25.67	1.677			C ₃ POLY GASO.	87.5	1.69	0.283			
C ₂ H ₄ _{42.073}				0.785	0.135	5.68	0.352	0.352	0.487	0.135	5.68	0.371	4.32	1.315	0.086	C ₃ POLY TAR	12.5	0.24	0.32		
C ₃ H ₆ _{44.094}				0.080	0.014	0.62	0.036	0.036	0.050	0.014	0.62	0.041	4.24	0.146	0.010						
C ₄ H ₁₀ _{56.104}				1.210	0.208	11.67	0.543	0.543	0.751	0.208	11.67	0.762	5.00	2.334	0.152						
C ₅ H ₁₂ _{58.120}				0.585	0.100	5.81	0.262	0.262	0.362	0.100	5.81	0.380	4.86	1.195	0.078	C ₄ H ₈	5.00	--	--	68.0	
C ₆ H ₁₄ _{70.130}				0.795	0.136	9.54	0.357	0.357	0.493	0.136	9.54	0.623	5.48	1.750	0.114	C ₅ POLY GASO.	5.98	10.21	1.708	1.5	
C ₇ H ₁₆ _{72.146}				0.290	0.050	3.61	0.130	0.130	0.180	0.050	3.61	0.236	5.25	0.688	0.045	C ₆ H ₁₀	4.86	4.81	0.990	68.0	
C ₈ H ₁₈ _{84.152}				0.365	0.063	5.30	0.164	0.164	0.227	0.063	5.30	0.346	5.54	0.957	0.063	C ₇ FREE GASO.			10.211	5.8	
C ₉ +C ₁₀											42.23	2.759		8.385	0.548	C ₈ POLY TAR	7.53	1.46	0.194		
TOTAL		41.354	522.47		17.154	338.63	44.864	86.218	68.770												
H ₂ +CO	97.544	40.338	15308.5554 SCFH	11.018			28.816	69.154	39.834	-29.320											
H ₂ /CO		1.62	Factor 653229	3.02			3.02	2.06	3.02	1.31											
Weight Recovery, %	94.64	Catalyst Age, hrs.		Space Velocity, vhw	120.4	RECOVERED OIL	0.443	62.17	4.061	9.524	0.622				GAS OIL	1.672	0.1092	592			
Pressure, psig	417	Inlet Velocity, Ft./sec	1.01	Catalyst Vol CF	12.71	TOTAL OIL	104.40	6.820	17.909	1.170					FUEL OIL	1.179	0.0770	417			
Temperature, °F	659	Bed Depth, Ft	19.26	Weight, #	1551	WATER SOLUBLE CHEMICALS	0.228	12.12	0.792	1.510	0.099				POLY TAR	0.226	0.0148	80			
Recycle Ratio	1.08	Bed Density, #/CF	122	Effluent (H ₂)(CO ₂) = Shift Ratio (H ₂ O)(CO)		TOTAL LIQUID PRODUCTS C ₆ +	116.52	7.612	19.419	1.269					TOTAL	15.986	1.0443	5661			
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY		NET WATER		6.081		109.55		7.156		13.151		0.859	
Contraction	CO	H ₂	H ₂ +CO	CO	H ₂	CO+H ₂	C ₃ +C ₄	GROSS WATER	121.67	7.948	14.661	0.958			TOTAL	17.496	1.1429	6196			
58.52	82.20	66.80	72.69	56.09	35.75	42.40	81.95	HYDROCARBON TOTAL — C ₆ +	142.19	9.289											

Form ML-11

ρ/NCM = 16.91 X #/MCF ρ488 MCFH H₂ + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA SUMMARY

RUN NO. 62-L
HOURS 254-279

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA							
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE					
Oxygen	444	Fresh Feed	15694	* API	49.0	10.5		In Reactor at Start of Period		Screen Analysis					
Natural Gas	440	Recycle	17026	Neut. No.	38.9	37.3		Fresh Catalyst Added		Mesh	Microns	%	Microns	%	
Generator Outlet	422	Combined Feed	32720	Sap. No.	49.0	42.3		Total		On 40	419+		80+		
Reactor Inlet	417	Wet Gas—Measured	5972	Hydrox. No.				Catalyst Recovered	55	100	150		40—80		
Condenser Inlet		Adjusted	6510	Bromine No.	86			In Reactor at End of Period		150	105		20—40		
Product Accumulator	372	Loss	538	Pour °F.						200	74		10—20		
				Chemicals, % by K ₂ CO ₃		10.3		REACTOR d-p, Inches H ₂ O		250	62		0—20		
								No. Height		325	44				
TEMPERATURES—°F.				Recycle/Fresh Feed				1.08		0 See Per. A		45		325	
Oxygen	464	Inlet Velocity—ft./sec.	1.01					1		64	CATALYST				
Natural Gas	796	Fresh Feed Rate—S.C.F.H.	15309	HEMPEL DIST. %		*API		2		68	Bulk Density, Lbs./Cu.Ft.				
Generator	2383	per Cu. Ft. Dense Bed	1204	205 °F.				3		53	Aerated				
Quench Accumulator	154	per Lb. Catalyst	9.87	400	69.0	53.8		4		222	Settled				
Reactor Inlet	387	per Sq. Ft.	23195	400-550	19.2	37.9		Total		452	Compacted				
Condenser Inlet	588			550+	11.8						Particle Density, gm./cc.				
Product Accumulator	91							CALCULATED FROM dp			NH ₃ Value, ml./gm.				
Catalyst No.	Height	A. S. T. M. DIST. ON				Density, Lbs./Cu.Ft.		122	N ₂ Surface, m ² /gm.						
1	See Per. A	662	Naphtha °F.				Inventory, Lbs.		1551						
2	669	IBP				118		Bed Depth, Ft.		19.26	CHEMICAL ANALYSIS				
3	649	10%				152		Vol., Cu. Ft.		12.71	Fe				
4	656	50%				244					C				
5	662	90%				362					O				
6	663	EP				410					H				
7	654	Rec.				97.0					K ₂ O, W+. % basis Fe				
8	640										X-Ray Analysis—				
9	637										Fe ₂ O ₃				
10	637										Fe ₂ O ₃				
11	618										Fe				

THE TEXAS COMPANY — MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 62-M
HOURS 279-303
CATALYST Fresh CM&S

FRESH FEED				WET GAS			RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H ₂ + CO FED								
	%	m/hr	#/hr	%	At Wt. Balance							CONDENSATE			YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*					
					m/hr	#/hr	m/hr	m/hr	m/hr	#/hr	#/MCF	#/gal	gal/hr	gal/MCF		CORRECTED HEMPEL, %	gal/hr	TREATING RECOVERY, %	gal/hr	
CO _{28.010}	37.330	15.456	432.93	16.337	2.907	81.44	7.396	22.852	10.303	-12,549	-351.49									
H ₂ _{2.016}	60.086	24.877	50.15	48.614	8.650	17.44	22.008	46.885	30.658	-16,227	-32.71					400 EP	70.0	6.588	98.0	6.456
CO _{24.010}	2.177	0.901	39.65	22.213	3.955	174.06	10.056	10.957	14.011	3.054	134.41	8.782				400-550	20.0	1.983	91.4	1.721
N ₂ _{28.016}	0.167	0.069	1.93	1.197	0.213	5.97	0.542	0.611	0.755							550 +	10.0	0.941	114.6	1.078
CH ₄ _{16.012}	0.240	0.099	1.59	5.383	0.958	15.37	2.437	2.536	3.395	0.959	13.78	0.900								
C ₂ H ₆ _{28.022}				1.313	0.234	6.56	0.594	0.594	0.828	0.234	6.56	0.429								
C ₂ H ₄ _{30.028}				0.763	0.136	4.09	0.345	0.345	0.481	0.136	4.09	0.267				PROPYLENE	32.7	3.40		
C ₁ +C ₂											24.43	1.596				C ₃ POLY GASO.	87.5	2.97	0.497	
C ₂ H ₂ _{22.078}				1.390	0.247	10.39	0.629	0.629	0.876	10.247	10.39	0.879	4.32	2.405	0.157	C ₃ POLY TAR	12.5	0.43	0.057	
C ₂ H ₂ _{24.029}				0.193	0.034	1.50	0.087	0.087	0.121	0.034	1.50	0.098	4.24	0.354	0.023					
C ₂ H ₂ _{26.104}				1.190	0.212	11.89	0.539	0.539	0.751	0.212	11.89	0.777	5.00	2.378	0.155		#/gal	#/hr	gal/hr	RVP
C ₂ H ₂ _{28.120}				0.440	0.078	4.53	0.199	0.199	0.277	0.078	4.53	0.296	4.86	0.932	0.061	C ₄ H ₆	5.00	--	--	68.0
C ₂ H ₂ _{30.130}				0.587	0.104	7.29	0.266	0.266	0.370	0.104	7.29	0.476	5.45	1.338	0.087	C ₄ POLY GASO.	5.98	10.40	1.740	1.5
C ₂ H ₂ _{32.142}				0.120	0.021	1.52	0.054	0.054	0.075	0.021	1.52	0.099	5.25	0.290	0.019	C ₄ H ₁₀	4.86	(4.53)	(0.932)	68.0
C ₂ H ₂ _{34.156}				0.260	0.046	3.87	0.118	0.118	0.164	0.046	3.87	0.253	5.54	0.699	0.046	C ₄ -FREE GASO.			9.280	5.8
C ₃ -C ₆											40.99	2.678		8.596	0.548	C ₄ POLY TAR	7.53	1.49	0.198	
TOTAL		41.402	526.25		17.795	345.92	45.270	86.672	69.688											
H ₂ +CO	97.416	40.333	1530600	192 SCFH	11.557		29.404	69.737	40.961	-28.776							gal/hr	gal/MCF	Bbl/Day	
H ₂ /CO		1.61	Factor	653338	2.98		2.98	2.05	2.98	1.29						10 # RVP 400 EP GASOLINE	11.947	0.7805	4232	
Weight Recovery, %	94.07																			
Pressure, psig	418																			
Temperature, °F	658																			
Recycle Ratio	1.09																			
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY				NET WATER								
Contraction	CO	H ₂	H ₂ +CO	CO	H ₂	CO+H ₂	C ₃ +C ₄ +	GROSS WATER				TOTAL								
57.02	81.19	65.23	71.35	54.91	34.61	41.26	82.32	HYDROCARBON TOTAL—C ₁ +				TOTAL								

Form ML-11

g/NCM = 16.91 X #/MCF #9488 MCFH H₂ + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA SUMMARY

RUN NO. 62-M
HOURS 279-303

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA			
PRESSURES PSIG		RATES S C F H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE	
										Screen Analysis	
Oxygen	446	Fresh Feed	15712	* API	49.2	10.5	In Reactor at Start of Period		Sedimentation		
Natural Gas	441	Recycle	17180	Neut. No.	37.0	37.3	Fresh Catalyst Added		Mesh	Microns	%
Generator Outlet	423	Combined Feed	32892	Sap. No.	49.0	41.9	Total		On 40	419+	80+
Reactor Inlet	418	Wet Gas—Measured	6144	Hydrox. No.			Catalyst Recovered		50	100	150
Condenser Inlet		Adjusted	6753	Bromine No.	86		In Reactor at End of Period		150	105	20-40
Product Accumulator	372	Loss	609	Pour °F.			REACTOR d-p, Inches H ₂ O		250	62	0-20
				Chemicals, % by K ₂ CO ₃	10.0		No. Height		325	44	
TEMPERATURES—°F.		Recycle/Fresh Feed	1.09				0	See Per. A	45	<325	
Oxygen	488	Inlet Velocity—ft./sec.	1.01				1		63	CATALYST	
Natural Gas	803	Fresh Feed Rate—S.C.F.H.	15306	HEMPEL, DIST. %			2		68	Bulk Density, Lbs./Cu.Ft.	
Generator	2383	per Cu. Ft. Dense Bed	1240	205 °F.			3		50	Aerated	
Quench Accumulator	152	per Lb. Catalyst	10.42	400	69.0	54.0	4		202	Settled	
Reactor Inlet	405	per Sq. Ft.	23191	400-550	20.0	37.9	Total		428	Compacted	
Condenser Inlet	589			550+	11.0					Particle Density, gm./cc.	
Product Accumulator	85						CALCULATED FROM dp			NH ₃ Value, ml./gm.	
Catalyst No.	Height			A. S. T. M. DIST. ON			Density, Lbs./Cu.Ft.		119	N ₂ Surface, m ² /gm.	
1	See Per. A	654		Naphtha °F.			Inventory, Lbs.		1469		
2	664			IBP	116		Bed Depth, Ft.		18.70	CHEMICAL ANALYSIS	
3	649			10%	150		Vol., Cu. Ft.		12.34	Fe	
4	654			50%	244					C	
5	663			90%	352					O	
6	662			EP	402					H	
7	656			Rec.	97.0					K ₂ O, W+, % basis Fe	
8	640									X-Ray Analysis—	
9	637									Fe ₂ C ₃	
10	638									Fe ₃ O ₄	
11	621									Fe	

THE TEXAS COMPANY — MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 62-N
HOURS 303-327
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, CONDENSATE, YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*. Rows include various hydrocarbons like CO, H2, CO2, N2, CH4, C2H4, C2H6, C2H2, C2H8, C2H10, C2H12, C3-C4, and summary rows for H2+CO, H2/CO, and conversion data.

Form ML-11

g/NCM = 16.91 X # / MCF *9488 MCFH H2 + CO, Bbl/Day = 5421.6 X gal / MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA SUMMARY

RUN NO. 62-N
HOURS 303-327

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include operating parameters like pressures (Oxygen, Natural Gas, Generator Outlet, Reactor Inlet, Condenser Inlet, Product Accumulator), temperatures, catalyst inventory, and analysis data.

THE TEXAS COMPANY — MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 62-0
HOURS 327-351
CATALYST

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, CONDENSATE, YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*. Rows include CO, H2, CO2, N2, CH4, C2H6, C2H4, C2H2, C2H4, C2H6, C2H8, C2H10, C2H12, C2H14, C2H16, C2H18, C2H20, C2H22, C2H24, C2H26, C2H28, C2H30, C2H32, C2H34, C2H36, C2H38, C2H40, C2H42, C2H44, C2H46, C2H48, C2H50, C2H52, C2H54, C2H56, C2H58, C2H60, C2H62, C2H64, C2H66, C2H68, C2H70, C2H72, C2H74, C2H76, C2H78, C2H80, C2H82, C2H84, C2H86, C2H88, C2H90, C2H92, C2H94, C2H96, C2H98, C2H100.

Form ML-11

g/NCM = 16.91X#/MCF 89488 MCFH H2 + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA SUMMARY

RUN NO. 62-0
HOURS 327-351

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Rows include: PRESSURES PSIG, RATES S.C.F.H., OIL, WATER, INVENTORY DATA, PARTICLE SIZE, TEMPERATURES -°F., HEMPEL DIST. %, A. S. T. M. DIST. ON, CHEMICAL ANALYSIS.

THE TEXAS COMPANY — MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 62-P
HOURS 351-375
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2 + CO FED. Includes rows for CO, H2, CO2, N2, CH4, C2H2, C2H4, C2H6, C3H8, C4H10, C4H8, C4H6, C4H4, C3-C6, TOTAL, H2+CO, H2/CO, and various recovery and conversion percentages.

Form ML-11

g/NCM = 16.91 X #/MCF *9488 MCFH2 + CO. Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA SUMMARY

RUN NO. 62-P
HOURS 351-375

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Includes rows for Pressures, Temperatures, Catalyst No., and various operational parameters like rates, conversions, and catalyst characteristics.

THE TEXAS COMPANY — MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 62-Q
HOURS 375-399
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2+CO FED. Includes sub-sections for CONDENSATE and various recovery metrics.

Form ML-11

g/NCM = 16.91 X # / MCF 89488 MCFH H2 + CO, Bbl/Day = 5421.6 X gal / MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA SUMMARY

RUN NO. 62-Q
HOURS 375-399

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Contains detailed process parameters, catalyst inventory, and chemical analysis data.

THE TEXAS COMPANY — MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 62-R
HOURS 399-423
CATALYST Fresh CM&S

FRESH FEED				WET GAS				RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H ₂ + CO FED											
ST	%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE												
					m/hr	#/hr						#/MCF	#/gal	gal/hr	gal/MCF	YIELDS	BASIS	BROWNSVILLE DESIGN	FEED RATE*					
CO	36.755	15.059	421.81	15.10	2.766	77.49	6.857	21.916	9.623	-12.293	-344.32							CONNECTED HEMPEL %	gal/hr	TREATING RECOVERY %	gal/hr			
H ₂	59.715	24.465	49.32	49.15	9.003	18.15	22.320	46.785	31.323	-15.462	-31.17							400 EP	70.6	6.663	98.0	6.530		
CO ₂	2.600	1.065	46.87	22.29	4.083	179.71	10.122	11.187	14.205	3.018	132.84	8.857						400-550	18.0	1.699	91.4	1.553		
N ₂	0.440	0.180	5.04	1.13	0.207	5.80	0.513	0.693	0.720									550 +	11.4	1.076	114.6	1.233		
CH ₄	0.490	0.201	3.22	6.36	1.165	18.69	2.888	3.089	4.053	0.964	15.47	1.031												
C ₂ H ₆				1.67	0.306	8.58	0.758	0.758	1.064	0.306	8.58	0.572							RECOVERY %	#/hr	gal/hr			
C ₃ H ₈				0.74	0.136	4.09	0.336	0.336	0.472	0.136	4.09	0.273							PROPYLENE	31.6	1.41			
C ₄ +C ₂										28.14	1.876								C ₃ POLY GASO.	87.5	1.23	0.206		
C ₂ H ₄				0.58	0.106	4.46	0.263	0.263	0.369	0.106	4.46	0.297	4.32	1.032	0.069				C ₃ POLY TAR	12.5	0.18	0.024		
C ₂ H ₂				0.15	0.027	1.19	0.068	0.068	0.095	0.027	1.19	0.079	4.24	0.281	0.019									
C ₂ H ₂				1.10	0.201	11.28	0.500	0.500	0.701	0.201	11.28	0.752	8.00	2.256	0.150					#/gal	#/hr	gal/hr	RVP	
C ₂ H ₂				0.48	0.088	5.11	0.218	0.218	0.306	0.088	5.11	0.341	4.86	1.051	0.070					C ₄ H ₆	5.00	--	--	68.0
C ₂ H ₂				0.70	0.128	8.98	0.318	0.318	0.496	0.128	8.98	0.599	5.45	1.648	0.110					C ₄ POLY GASO.	5.98	9.27	1.651	1.5
C ₂ H ₂				0.19	0.035	2.53	0.086	0.086	0.121	0.035	2.53	0.169	5.25	0.482	0.032					C ₄ H ₁₀	4.86	(5.11)	(1.051)	68.0
C ₂ H ₂				0.36	0.066	5.55	0.163	0.163	0.229	0.066	5.55	0.370	5.54	1.002	0.067					C ₄ FREE GASO.		4.65	0.956	
C ₂ -C ₄																				C ₄ POLY TAR	7.53	1.41	0.187	
TOTAL		40.970	526.26		18.317	351.61	45.410	86.380	70.062															
H ₂ +CO	96.470	39.524	14999	SCFH	11.769		29.177	68.701	40.946	-27.755										gal/hr	gal/MCF	Bbl/Day		
H ₂ /CO		1.62	Factor 666711		3.25		3.26	2.13	3.26	1.26										10 # RVP 400 EP GASOLINE	12.475	0.8317	4509	
Weight Recovery, %	91.31		Catalyst Age, hrs.		Space Velocity, vhr	1367		RECOVERED OIL	0.435	61.05	4.070	9.438	0.629							GAS OIL	1.553	0.1035	561	
Pressure, psig	416		Inlet Velocity, Ft/sec	1.02	Catalyst Vol CF	10.97		TOTAL OIL		100.15	6.677	17.190	1.146							FUEL OIL	1.233	0.0822	446	
Temperature, °F	663		Bed Depth, Ft	16.62	Weight, #	1229		WATER SOLUBLE CHEMICALS	0.208	11.05	0.737	1.368	0.091							POLY TAR	0.211	0.0141	76	
Recycle Ratio	1.11		Bed Density, #/CF	112	Effluent (H ₂ /CO ₂) Shift Ratio (H ₂ O/CO)			TOTAL LIQUID PRODUCTS C ₂ +		111.20	7.414	18.558	1.237							TOTAL	15.472	1.0315	5592	
FRESH FEED CONVERSION -- %				TOTAL FEED CONVERSION -- %				SELECTIVITY				NET WATER				W. S. CHEM.								
Contraction	CO	H ₂	H ₂ +CO	CO	H ₂	CO+H ₂	C ₃ +C ₄ +	GROSS WATER		113.60	7.574	13.679	0.912							TOTAL	16.840	1.1227	6086	
55.29	81.63	63.20	70.22	56.09	33.05	40.40	79.80	HYDROCARBON TOTAL -- C ₂ +		139.34	9.290													

Form ML-11

g/NCM = 16.91 X #/MCF *9488 MCFH₂ + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA SUMMARY

RUN NO. 62-R
HOURS 399-423

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA				
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE		
Oxygen	442	Fresh Feed	15548	* API	49.4	10.4		In Reactor at Start of Period		Screen Analysis	Sedimentation	
Natural Gas	438	Recycle	17233	Neut. No.	35.7	36.4		Fresh Catalyst Added		Mesh	Microns %	Microns %
Generator Outlet	420	Combined Feed	32781	Sap. No.	46.4	43.3		Total		On 40	419+	80+
Reactor Inlet	416	Wet Gas - Measured	6047	Hydrox. No.				Catalyst Recovered	55	100	150	40-80
Condenser Inlet		Adjusted	6951	Bromine No.				In Reactor at End of Period		150	105	20-40
Product Accumulator	370	Loss	904	Pour °F.						200	74	10-20
				Chemicals, % by K ₂ CO ₃		10.0		REACTOR d-p. Inches H ₂ O		250	62	0-20
								No. Height		325	44	
TEMPERATURES -- °F.		Recycle/Fresh Feed	1.11					0 See Per. A	39	<325		
Oxygen	491	Inlet Velocity - ft./sec.	1.02					1	55	CATALYST		
Natural Gas	800	Fresh Feed Rate - S.C.F.H.	14999	HEMPEL DIST. %		*API		2	60	Bulk Density, Lbs./Cu.Ft.		
Generator	2365	per Cu. Ft. Dense Bed	1367	205 °F.				3	54	Aerated		
Quench Accumulator	160	per Lb. Catalyst	12.20	400	69.6	53.0		4	150	Settled		
Reactor Inlet	425	per Sq. Ft.	22726	400-550	18.0	38.0		Total	358	Compacted		
Condenser Inlet	617			550+	12.4					Particle Density, gm./cc.		
Product Accumulator	87							CALCULATED FROM dp		NH ₃ Value, ml./gm.		
Catalyst No.	Height			A. S. T. M. DIST. ON				Density, Lbs./Cu.Ft.	112	N ₂ Surface, m ² /gm.		
1 See Per. A	600			Naphtha °F.				Inventory, Lbs.	1229			
2	665			IBP	118			Bed Depth, Ft.	16.62	CHEMICAL ANALYSIS		
3	658			10%	148			Vol., Cu. Ft.	10.97	Fe		
4	662			50%	250					C		
5	665			90%	380					O		
6	665			EP	424					H		
7	650			Rec.	96.5					K ₂ O. W+. % basis Fe		
8	642									X-Ray Analysis--		
9	647									Fe ₂ O ₃		
10	650									Fe ₂ O ₄		
11	626									Fe		