

LaPORTE LPMEETHANOL PROCESS AVERAGE REPORT
CONVERSION-SELECTIVITY-PRODUCTIVITY

1100 20-May-85 - 2400 20-May-85

CONVERSIONS ACROSS REACTOR :

		<u>GC#1</u>	<u>GC#2</u>
HYDROGEN CONVERSION	(Z) :	32.3	32.3
CARBON MONOXIDE CONVERSION	(Z) :	11.7	11.4
CARBON DIOXIDE CONVERSION	(Z) :	-0.1	-0.6
RATIO H2 CONSUMED/CO CONSUMED	:	1.96	2.03

*** See next page for conversions as calc. by overall bal.

SELECTIVITIES :

	<u>ACROSS REACTOR</u> <u>GC Average</u>	<u>OVERALL</u> <u>z</u>
CO (+CO2) SELECTIVITY TO METHANOL (Z) :	101.5	97.0
CO (+CO2) SELECTIVITY TO ETHANOL (Z) :		0.5

z Methanol in flashed gas not measured
Ethanol only measured in product flow

METHANOL PRODUCTIVITIES & YIELDS

<u>MEDH SOURCE</u>	<u>smol/hr-kg cat</u>	<u>kg/1000 Na3 fresh feed</u>	<u>kg/1000 Na3 reactor feed</u>
As calculated ACROSS REACTOR	27.21	376.1	83.9
As Net MeOH produced, OVERALL balance	26.75	369.8	82.5

REACTOR FEED $\{H_2/(CO+1.5CO_2)\}$:	0.53
REACTOR FEED $\{(H_2-CO_2)/(CO+CO_2)\}$:	0.39
APPROACH TO METHANOL EQUILIBRIUM (des.C) :	27.3
APPROACH TO WATER-GAS EQUILIBRIUM (des.C) :	n.a.
METHANOL COLLECTED AS Z OF CALCULATED :	97.6
CALCULATED METHANOL PRODUCTION RATE (Ksmol/hr) :	6.15

**LAPORTE LPMETHANOL PROCESS AVERAGE REPORT
MATERIAL BALANCE SUMMARY**

1100 20-May-85 - 2400 20-May-85

COMPONENT BALANCE (IN-OUT)/IN :

STREAMS # STREAMS LOCATION COMPONENT :	[PURE GASES - 1] FRESH FEED GAS	[(1+55)-15] REACTOR FEED	[25 - (50+51+62+68)] REACTOR EFFLUENT
	<Z diff.>	<Z diff.>	<Z diff.>
H2	-5.61800	0.36231	0.58927
CO	-0.61626	-0.64703	0.22985
CO2	-98.20330	-2.16289	2.37759
N2	-114.57300	-1.71943	-6.09593
CH4	n.a.	0.37242	-23.97980
H2O		100.00000	-267.16400
CH3OH		-3.47919	2.62193

OVERALL ELEMENTAL BALANCE (Kg-atoms/hr) :

STREAM # STREAM NAME	INPUTS		OUTPUTS				(IN-OUT)/IN
	15 REACTOR FEED	55 RECYCLE	50 PURGE GAS	62 FLASH GAS	68 MeOH PRODUCT	TOTAL	Z
CARBON:							
CO	52.8653	44.0331	2.7189	0.0541	—	46.8060	11.4617
CO2	12.4514	11.5129	0.7109	0.1392	—	12.3630	0.7107
CH3OH	0.4515	0.4364	0.0269	0.0170	6.0022	6.4825	-1335.6400
OTHERS	0.5579	0.5287	0.0326	0.0026	0.1949	0.7588	-36.0166
TOTAL C	66.3261	56.5110	3.4894	0.2128	6.1970	66.4103	-0.1268
HYDROGEN:							
H2	75.5377	47.8455	2.9543	0.0262	—	50.8260	32.7144
H2O	0.0000	0.0000	0.0000	0.0006	0.2002	0.2007	n.a.
OTHERS	4.0762	3.8993	0.2408	0.0794	24.4996	28.7191	-604.5620
TOTAL H	79.6139	51.7448	3.1951	0.1062	24.6998	79.7458	-0.1657
OXYGEN:							
TOTAL O	78.2390	67.5148	4.1688	0.3502	6.2088	78.2426	-0.0047
NITROGEN:							
TOTAL N	1.7608	1.6602	0.1025	0.0017	—	1.7644	-0.2066
TOTAL MASS FLOW (kg/hr)	2150.2300	1830.1800	113.0080	8.3681	198.6710	2150.2300	0.0002

REACTOR GAS BALANCE (OUT/IN) :

	GC#1	GC#2
MASS BALANCE, (Z) :	100.000	100.000
ELEMENTAL BALANCE, (Z) :		
CARBON	99.926	100.402
HYDROGEN	100.346	100.573
OXYGEN	99.953	100.466
NITROGEN	100.769	100.147

LaPORTE LPNETHANOL PROCESS AVERAGE REPORT
ENTRAINED NODE
PROCESS VARIABLES & ANALYTICAL SUMMARY

DATE : 22-Jun-85
 TIME : 03:20 PM
 TIME INTERVAL: FROM: 0000 21-May
 TO: 2400 21-May
 20
 NUMBER OF AVERAGED HOURS :
 RUN ID NUMBER : EU-X754
 FEED GAS TYPE: CO-RICH GAS
 REACTOR FEED GAS INLET TEMP. (des.C) : 145.1
 OIL/SLURRY INLET TEMP. (des.C) : 245.2
 AVE. REACTOR TEMPERATURE (des.C) : 250.1
 REACTOR OUTLET TEMP. (des.C) : 248.0
 REACTOR GAS INLET PRESSURE (kPa) : 5472
 PRIMARY SEPARATOR GAS PRESSURE (kPa) : 5277
 GAS SUPERFICIAL VELOCITY (cm/sec) : 9.5
 LIQUID SUPERFICIAL VELOCITY (cm/sec) : 4.9
 SLURRY CONCENTRATION (wt%) : 24.7
 SPACE VELOCITY (1/ks-hr) : 10736
 RECYCLE/FRESH FEED RATIO : 3.61
 OIL/SLURRY CIRCULATION RATE (m3/hr) : 45.0
 PROD. SEPARATOR GAS FLOWRATE <S0> + <SS> (ksmol/hr) : 87.45
 PURGE GAS FLOW RATE <S0> (ksmol/hr) : 4.66

STREAM #	1	SS	10	15	25x	25x	62	68
STREAM NAME	FRESH FEED	RECYCLE GAS	REACTOR FEED	REACTOR FEED	V/L SEP	V/L SEP	FLASH GAS	METH PRODUCT
ON-LINE GC#	1	2	1	2	2	1		
COMPONENT								
	<MOLZ>	<MOLZ>	<MOLZ>	<MOLZ>	<MOLZ>	<MOLZ>	<MOLZ>	<WTZ>
H2	59.40	28.89	35.07	35.11	27.03	26.78	5.73	
CO	36.41	54.39	50.78	50.79	50.72	50.77	23.60	
CO2	2.96	14.37	12.07	12.08	13.67	13.64	60.76	
N2	0.17	1.27	1.05	1.04	1.19	1.18	0.37	
CH4	0.08	0.62	0.52	0.51	0.58	0.57	0.92	
H2O	0.00	0.00	0.00	0.00	0.03	0.04	0.12	0.89
CH3OH	0.00	0.51	0.45	0.40	6.92	6.87	7.43	95.48
DME	0.00	0.02	0.02	0.02	0.01	0.02	0.21	0.00
C2H5OH								0.72
C3OH'S								0.25
C4OH'S								0.24
C5OH'S								0.15
ALKANES								0.00
ESTERS								0.86
ALDEHYDES								0.00
OIL								1.41
TOTAL :	99.01	100.08	99.96	99.95	100.15	99.88	99.13	100.00
DENS g/cc	0.005	0.047	0.033	0.033	0.029	0.029	0.004	0.790
AV. MOL. WT	12.89	22.75	20.78	20.77	23.39	23.43	36.53	32.56
M3/hr	513.4	1855.7	2361.5	2362.0	2097.8	2093.6	5.4	
ksmol/hr	22.90	82.79	105.36	105.38	93.59	93.41	0.24	5.93
1/hrprod								244.15

* Compositions correspond to STREAM#32

LaPORTE LPMETHANOL PROCESS AVERAGE REPORT
CONVERSION-SELECTIVITY-PRODUCTIVITY

0000 21-May-85 - 2400 21-May-85

CONVERSIONS ACROSS REACTOR :

	GC#1	GC#2
HYDROGEN CONVERSION (Z) :	32.3	31.6
CARBON MONOXIDE CONVERSION (Z) :	11.4	11.3
CARBON DIOXIDE CONVERSION (Z) :	-0.2	-0.5
RATIO H ₂ CONSUMED/CO CONSUMED :	1.96	1.93

*** See next page for conversions as calc. by overall bal.

SELECTIVITIES :

	ACROSS REACTOR GC Average	OVERALL %
CO (+CO ₂) SELECTIVITY TO METHANOL (Z) :	99.7	98.2
CO (+CO ₂) SELECTIVITY TO ETHANOL (Z) :		0.5

* Methanol in flashed gas not measured
Ethanol only measured in product flow

METHANOL PRODUCTIVITIES & YIELDS

METH SOURCE	smol/hr-ks cat	ks/1000 Na3 fresh feed	ks/1000 Na3 reactor feed
As calculated ACROSS REACTOR	27.28	374.7	81.4
As Net MeOH produced, OVERALL balance	26.32	361.5	78.6

REACTOR FEED (H ₂ /(CO+1.5CO ₂)) :	0.51
REACTOR FEED ((H ₂ -CO ₂)/(CO+CO ₂)) :	0.37
APPROACH TO METHANOL EQUILIBRIUM (des.C) :	27.2
APPROACH TO WATER-GAS EQUILIBRIUM (des.C) :	n.a.
METHANOL COLLECTED AS % OF CALCULATED :	95.8
CALCULATED METHANOL PRODUCTION RATE (Ksmol/hr) :	6.00

LaPORTE LPMEETHANOL PROCESS AVERAGE REPORT
MATERIAL BALANCE SUMMARY

0000 21-May-85 - 2400 21-May-85

COMPONENT BALANCE (IN-OUT)/IN :

STREAMS # STREAMS LOCATION COMPONENT :	[PURE GASES - 1] FRESH FEED GAS	[(1+55)-15] REACTOR FEED	[25 - (50+51+62+68)] REACTOR EFFLUENT
	<Z diff.>	<Z diff.>	<Z diff.>
H2	-4.30622	1.39604	0.08610
CO	-0.78427	-0.29292	-0.20146
CO2	-97.67770	-1.19290	1.76804
N2	-188.94000	-0.65548	-4.93708
CH4	n.a.	-0.77463	-26.92900
H2O	---	n.a.	-233.13300
CH3OH	---	0.52121	4.03542

OVERALL ELEMENTAL BALANCE (Kg-atoms/hr) :

STREAM # STREAM NAME	INPUTS		OUTPUTS				(IN-OUT)/IN
	15 REACTOR FEED	55 RECYCLE	50 PURGE GAS	62 FLASH GAS	68 MeOH PRODUCT	TOTAL	Z
CARBON:							
CO	53.5256	45.0313	2.5338	0.0566	---	47.6217	11.0300
CO2	12.7284	11.9001	0.6696	0.1458	---	12.7154	0.1024
CH3OH	0.4183	0.4205	0.0237	0.0178	5.7495	6.2115	-1384.8400
OTHERS	0.5592	0.5345	0.0301	0.0027	0.1939	0.7512	-34.3299
TOTAL C	67.2316	57.8864	3.2571	0.2229	5.9334	67.2998	-0.1015
HYDROGEN:							
H2	73.9913	47.3329	2.6914	0.0275	---	50.5518	31.6788
H2O	0.0000	0.0000	0.0000	0.0006	0.1902	0.1908	n.a.
OTHERS	3.9508	3.8566	0.2170	0.0831	23.4614	27.6181	-599.0490
TOTAL H	77.9421	51.6895	2.9084	0.1112	23.6516	78.3607	-0.5370
OXYGEN:							
TOTAL O	79.4211	69.2702	3.8976	0.3668	5.9455	79.4801	-0.0744
NITROGEN:							
TOTAL N	2.1885	2.0978	0.1180	0.0018	---	2.2176	-1.3310
TOTAL MASS FLOW (kg/hr)	2188.8500	1883.8500	105.9980	8.7658	190.2350	2188.8500	0.0002

REACTOR GAS BALANCE (OUT/IN) :

	GC#1	GC#2
MASS BALANCE, (Z) :	100.000	100.000
ELEMENTAL BALANCE, (Z) :		
CARBON	99.815	100.080
HYDROGEN	99.922	101.077
OXYGEN	99.946	100.197
NITROGEN	100.085	101.419

LaPORTE LPMETHANOL PROCESS AVERAGE REPORT
ENTRAINED MODE
PROCESS VARIABLES & ANALYTICAL SUMMARY

DATE : 22-Jun-85
 TIME : 03:50 PM
 TIME INTERVAL: FROM: 0000 22-May
 TO: 2400 22-May
 23
 NUMBER OF AVERAGED HOURS :
 RUN ID NUMBER : EU-X754
 FEED GAS TYPE: CO-RICH GAS
 REACTOR FEED GAS INLET TEMP. (des.C) : 145.7
 OIL/SLURRY INLET TEMP. (des.C) : 245.2
 AVE. REACTOR TEMPERATURE (des.C) : 249.9
 REACTOR OUTLET TEMP. (des.C) : 248.0
 REACTOR GAS INLET PRESSURE (kPa) : 5472
 PRIMARY SEPARATOR GAS PRESSURE (kPa) : 5278
 GAS SUPERFICIAL VELOCITY (cm/sec) : 9.5
 LIQUID SUPERFICIAL VELOCITY (cm/sec) : 4.9
 SLURRY CONCENTRATION (wt%): 24.8
 SPACE VELOCITY (L/kg-hr) : 10664
 RECYCLE/FRESH FEED RATIO : 3.57
 OIL/SLURRY CIRCULATION RATE (m3/hr) : 44.9
 PROD. SEPARATOR GAS FLOWRATE <S0> + <S5> (kkmol/hr) : 87.00
 PURGE GAS FLOW RATE <S0> (kkmol/hr) : 4.90

STREAM #	1	55	10	15	25x	25x	62	68
STREAM NAME	FRESH FEED	RECYCLE GAS	REACTOR FEED	REACTOR FEED	V/L SEP	V/L SEP	FLASH GAS	MEDM PRODUCT
ON-LINE GC#	1	2	1	2	2	1		
COMPONENT	<MOL>	<MOL>	<MOL>	<MOL>	<MOL>	<MOL>	<MOL>	<WT>
H2	59.24	29.13	35.39	35.40	27.22	27.08	5.73	—
CO	36.49	54.42	50.73	50.75	50.78	50.78	23.60	—
CO2	2.94	14.24	11.96	11.95	13.54	13.54	60.76	—
N2	0.14	1.05	0.86	0.86	0.97	0.97	0.37	—
CH4	0.08	0.68	0.56	0.55	0.63	0.64	0.92	—
H2O	0.00	0.00	0.00	0.00	0.03	0.05	0.12	0.91
CH3OH	0.00	0.51	0.45	0.40	6.97	6.91	7.43	95.56
DME	0.00	0.02	0.02	0.02	0.01	0.02	0.21	0.00
C2H5OH	—	—	—	—	—	—	—	0.73
C3OH'S	—	—	—	—	—	—	—	0.27
C4OH'S	—	—	—	—	—	—	—	0.24
C5OH'S	—	—	—	—	—	—	—	0.16
ALKAHENES	—	—	—	—	—	—	—	0.00
ESTERS	—	—	—	—	—	—	—	0.81
ALDEHYDES	—	—	—	—	—	—	—	0.00
OIL	—	—	—	—	—	—	—	1.32
TOTAL :	98.89	100.05	99.96	99.93	100.15	99.98	99.13	100.00
DENS,g/cc	0.005	0.047	0.032	0.032	0.029	0.029	0.004	0.790
AV.MOL.WT	12.91	22.66	20.68	20.67	23.31	23.34	36.53	32.52
M3/hr	515.9	1840.1	2356.6	2356.7	2089.4	2087.2	5.2	—
kkmol/hr	23.02	82.10	105.14	105.14	93.22	93.12	0.23	6.02
L/hr,prod	—	—	—	—	—	—	—	247.62

* Compositions correspond to STREAM#32

LaPORTE LPMETHANOL PROCESS AVERAGE REPORT
CONVERSION-SELECTIVITY-PRODUCTIVITY

0000 22-May-85 - 2400 22-May-85

CONVERSIONS ACROSS REACTOR :

		GC#1	GC#2
		<u> </u>	<u> </u>
HYDROGEN CONVERSION	(Z) :	32.2	31.8
CARBON MONOXIDE CONVERSION	(Z) :	11.3	11.3
CARBON DIOXIDE CONVERSION	(Z) :	-0.3	-0.5
RATIO H2 CONSUMED/CO CONSUMED	:	1.98	1.97

*** See next page for conversions as calc. by overall bal.

SELECTIVITIES :

		ACROSS REACTOR GC Average	OVERALL %
		<u> </u>	<u> </u>
CO (+CO2) SELECTIVITY TO METHANOL	(Z) :	100.5	98.0
CO (+CO2) SELECTIVITY TO ETHANOL	(Z) :		0.5

* Methanol in flashed gas not measured
Ethanol only measured in product flow

METHANOL PRODUCTIVITIES & YIELDS

METH SOURCE	kmol/hr-kg cat	kg/1000 Nm3 fresh feed	kg/1000 Nm3 reactor feed
	<u> </u>	<u> </u>	<u> </u>
As calculated ACROSS REACTOR	27.23	373.7	81.8
As Net MeOH produced; OVERALL balance	26.60	365.1	79.9

REACTOR FEED (H2/(CO+1.5CO2)) :	0.52
REACTOR FEED ((H2-CO2)/(CO+CO2)) :	0.37
APPROACH TO METHANOL EQUILIBRIUM (des.C) :	27.5
APPROACH TO WATER-GAS EQUILIBRIUM (des.C) :	n.a.
METHANOL COLLECTED AS % OF CALCULATED :	97.0
CALCULATED METHANOL PRODUCTION RATE (Kmol/hr) :	6.02

LaPORTE LPMETHANOL PROCESS AVERAGE REPORT
MATERIAL BALANCE SUMMARY

0000 22-May-85 - 2400 22-May-85

COMPONENT BALANCE (IN-OUT)/IN :

STREAMS # STREAMS LOCATION COMPONENT :	[PURE GASES - 13 FRESH FEED GAS	[(1+55)-15] REACTOR FEED	[25 - (50+51+62+68)] REACTOR EFFLUENT
	<Z diff.>	<Z diff.>	<Z diff.>
H2	-4.16779	0.87812	0.08509
CO	-0.95900	-0.54332	-0.00731
CO2	-98.99250	-1.59775	1.85995
N2	-120.89200	-1.19997	-6.79433
CH4	n.a.	-1.55632	-24.04330
H2O	—	100.00000	-273.63800
CH3OH	—	0.02649	2.95360

OVERALL ELEMENTAL BALANCE (Ks-atoms/hr) :

STREAM # STREAM NAME	INPUTS		OUTPUTS				(IN-OUT)/IN
	15 REACTOR FEED	55 RECYCLE	50 PURGE GAS	62 FLASH GAS	68 MeOH PRODUCT	TOTAL	Z
CARBON:							
CO	53.3590	44.6722	2.6660	0.0543	—	47.3925	11.1817
CO2	12.5617	11.6870	0.6975	0.1397	—	12.5242	0.2982
CH3OH	0.4235	0.4225	0.0252	0.0171	5.8361	6.3009	-1387.8900
OTHERS	0.6002	0.5762	0.0344	0.0026	0.1863	0.7994	-33.1996
TOTAL C	66.9444	57.3590	3.4231	0.2137	6.0224	67.0172	-0.1088
HYDROGEN:							
H2	74.4403	47.8282	2.8544	0.0263	—	50.7089	31.8798
H2O	0.0000	0.0000	0.0000	0.0006	0.1984	0.1990	n.a.
OTHERS	4.1297	4.0356	0.2408	0.0797	23.8159	28.1720	-582.1890
TOTAL H	78.5700	51.8638	3.0952	0.1066	24.0143	79.0799	-0.6490
OXYGEN:							
TOTAL O	78.9234	68.4892	4.0874	0.3516	6.0356	78.9639	-0.0512
NITROGEN:							
TOTAL N	1.8063	1.7225	0.1028	0.0017	—	1.8270	-1.1431
TOTAL MASS FLOW (ks/hr)	2173.0700	1860.5000	111.0350	8.4013	193.1110	2173.0500	0.0008

REACTOR GAS BALANCE (OUT/IN) :

	GC#1	GC#2
MASS BALANCE, (Z) :	100.000	100.000
ELEMENTAL BALANCE, (Z) :		
CARBON	99.912	100.144
HYDROGEN	99.937	100.788
OXYGEN	100.026	100.234
NITROGEN	100.469	100.248

LaPORTE LPMETHANOL PROCESS AVERAGE REPORT
ENTRAINED MODE
PROCESS VARIABLES & ANALYTICAL SUMMARY

DATE :	22-Jun-85
TIME :	03:58 PM
TIME INTERVAL:	FROM: 0000 23-May
	TO: 2400 23-May
NUMBER OF AVERAGED HOURS :	21
RUN ID NUMBER :	EU-X754
FEED GAS TYPE:	CO-RICH GAS
REACTOR FEED GAS INLET TEMP. (des.C) :	145.2
OIL/SLURRY INLET TEMP. (des.C) :	245.2
Ave. REACTOR TEMPERATURE (des.C) :	250.1
REACTOR OUTLET TEMP. (des.C) :	248.0
REACTOR GAS INLET PRESSURE (kPa) :	5470
PRIMARY SEPARATOR GAS PRESSURE (kPa) :	5279
GAS SUPERFICIAL VELOCITY (cm/sec) :	9.5
LIQUID SUPERFICIAL VELOCITY (cm/sec) :	4.9
SLURRY CONCENTRATION (wt%) :	25.1
SPACE VELOCITY (1/ks-hr) :	10429
RECYCLE/FRESH FEED RATIO :	3.57
OIL/SLURRY CIRCULATION RATE (m3/hr) :	44.8
PROD.SEPARATOR GAS FLOWRATE <S0> + <S5> (ksmol/hr) :	87.08
PURGE GAS FLOW RATE <S0> (ksmol/hr) :	4.93

STREAM #	1	SS	10	15	25*	25*	62	68
STREAM NAME	FRESH FEED	RECYCLE GAS	REACTOR FEED	REACTOR FEED	V/L SEP	V/L SEP	FLASH GAS	NEOH PRODUCT
ON-LINE GC#	1	2	1	2	2	1		
COMPONENT								
	<MOLZ>	<MOLZ>	<MOLZ>	<MOLZ>	<MOLZ>	<MOLZ>	<MOLZ>	<WTZ>
H2	59.21	29.22	35.35	35.43	27.30	27.21	5.73	
CO	36.28	54.21	50.54	50.58	50.60	50.54	23.60	
CO2	2.94	14.18	11.91	11.91	13.49	13.47	60.76	
N2	0.16	1.17	0.97	0.97	1.09	1.10	0.37	
CH4	0.08	0.71	0.58	0.58	0.66	0.66	0.92	
H2O	0.00	0.00	0.00	0.00	0.03	0.05	0.12	1.05
CH3OH	0.00	0.50	0.43	0.39	6.99	6.89	7.43	95.57
DME	0.00	0.02	0.02	0.02	0.01	0.02	0.21	0.00
C2H5OH								0.76
C3OH'S								0.28
C4OH'S								0.21
C5OH'S								0.15
ALKANES								0.09
ESTERS								0.66
ALDEHYDES								0.00
OIL								1.32
TOTAL :	98.67	100.01	99.80	99.89	100.17	99.93	99.13	100.00
DEMS, g/cc	0.005	0.047	0.032	0.032	0.029	0.029	0.004	0.790
AV. MOL. WT	12.88	22.62	20.66	20.65	23.28	23.29	36.53	32.46
M3/hr	516.3	1841.4	2356.2	2357.0	2090.3	2089.7	5.1	
ksmol/hr	23.03	82.15	105.12	105.16	93.26	93.23	0.23	6.02
l/hrprod								247.15

* Compositions correspond to STREAM#32

LaPORTE LPMETHANOL PROCESS AVERAGE REPORT
CONVERSION-SELECTIVITY-PRODUCTIVITY

0000 23-May-85 - 2400 23-May-85

CONVERSIONS ACROSS REACTOR :

		<u>GC#1</u>	<u>GC#2</u>
HYDROGEN CONVERSION	(Z) :	31.7	31.7
CARBON MONOXIDE CONVERSION	(Z) :	11.3	11.3
CARBON DIOXIDE CONVERSION	(Z) :	-0.4	-0.4
RATIO H2 CONSUMED/CO CONSUMED	:	1.96	1.97

*** See next page for conversions as calc. by overall bal.

SELECTIVITIES :

		<u>ACROSS REACTOR</u> <u>GC Average</u>	<u>OVERALL</u> <u>±</u>
CO (+CO2) SELECTIVITY TO METHANOL	(Z) :	101.4	98.9
CO (+CO2) SELECTIVITY TO ETHANOL	(Z) :		0.5

* Methanol in flashed gas not measured
Ethanol only measured in product flow

METHANOL PRODUCTIVITIES & YIELDS

<u>METH SOURCE</u>	<u>mmol/hr-kg cat</u>	<u>kg/1000 Na3 fresh feed</u>	<u>kg/1000 Na3 reactor feed</u>
As calculated ACROSS REACTOR	26.72	374.8	82.1
As Net MeOH produced, OVERALL balance	25.96	364.1	79.8

REACTOR FEED (H2/(CO+1.5CO2)) :	0.52
REACTOR FEED ((H2-CO2)/(CO+CO2)) :	0.38
APPROACH TO METHANOL EQUILIBRIUM (des.C) :	27.4
APPROACH TO WATER-GAS EQUILIBRIUM (des.C) :	n.a.
METHANOL COLLECTED AS Z OF CALCULATED :	96.5
CALCULATED METHANOL PRODUCTION RATE (Kmmol/hr) :	6.04

LA PORTE LPMETHANOL PROCESS AVERAGE REPORT
MATERIAL BALANCE SUMMARY

0000 23-May-85 - 2400 23-May-85

COMPONENT BALANCE (IN-OUT)/IN :

STREAMS # STREAMS LOCATION COMPONENT :	[PURE GASES - 1] FRESH FEED GAS	[(1455)-15] REACTOR FEED	[25 - (50+51+62+68)] REACTOR EFFLUENT
	<Z diff.>	<Z diff.>	<Z diff.>
H2	-3.19919	1.01669	0.01598
CO	-0.49338	-0.56954	-0.03101
CO2	-97.59070	-1.60379	1.81658
N2	-175.71300	-2.20989	-5.50176
CH4	n.a.	-1.38914	-22.67610
H2O	-----	n.a.	-301.69800
CH3OH	-----	-0.32388	3.65215

OVERALL ELEMENTAL BALANCE (Ks-atoms/hr) :

STREAM # STREAM NAME	INPUTS		OUTPUTS				(IN-OUT)/IN Z
	15 REACTOR FEED	55 RECYCLE	50 PURGE GAS	62 FLASH GAS	68 MeOH PRODUCT	TOTAL	
CARBON:							
CO	53.1894	44.5328	2.6704	0.0541	-----	47.2573	11.1527
CO2	12.5264	11.6505	0.6986	0.1392	-----	12.4882	0.3044
CH3OH	0.4121	0.4108	0.0246	0.0170	5.8255	6.2779	-1423.2700
OTHERS	0.6258	0.5975	0.0358	0.0026	0.1755	0.8113	-29.6463
TOTAL C	66.7537	57.1916	3.4295	0.2128	6.0009	66.8348	-0.1215
HYDROGEN:							
H2	74.5161	48.0062	2.8787	0.0262	-----	50.9112	31.6776
H2O	0.0000	0.0000	0.0000	0.0006	0.2271	0.2276	n.a.
OTHERS	4.1881	4.0683	0.2440	0.0794	23.7535	28.1451	-572.0320
TOTAL H	78.7042	52.0745	3.1226	0.1062	23.9806	79.2839	-0.7366
OXYGEN:							
TOTAL O	78.6724	68.2622	4.0933	0.3502	6.0307	78.7364	-0.0814
NITROGEN:							
TOTAL N	2.0479	1.9301	0.1157	0.0017	-----	2.0476	0.0163
TOTAL MASS FLOW (ks/hr)	2171.2000	1858.6300	111.4530	8.3681	192.7410	2171.1900	0.0003

REACTOR GAS BALANCE (OUT/IN) :

	GC#1	GC#2
MASS BALANCE, (Z) :	100.000	100.000
ELEMENTAL BALANCE, (Z) :		
CARBON	100.006	100.219
HYDROGEN	100.477	101.079
OXYGEN	100.123	100.292
NITROGEN	100.582	99.696

LaPORTE LPMETHANOL PROCESS AVERAGE REPORT
ENTRAINED MODE
PROCESS VARIABLES & ANALYTICAL SUMMARY

DATE : 22-Jun-85
TIME : 04:07 PM
TIME INTERVAL: FROM: 0000 24-May
TO: 2400 24-May
NUMBER OF AVERAGED HOURS : 24
RUN ID NUMBER : EU-X754
FEED GAS TYPE: CO-RICH GAS
REACTOR FEED GAS INLET TEMP. (des.C) : 145.3
OIL/SLURRY INLET TEMP. (des.C) : 245.2
AVE. REACTOR TEMPERATURE (des.C) : 250.0
REACTOR OUTLET TEMP. (des.C) : 248.0
REACTOR GAS INLET PRESSURE (kPa) : 5470
PRIMARY SEPARATOR GAS PRESSURE (kPa) : 5279
GAS SUPERFICIAL VELOCITY (cm/sec) : 9.5
LIQUID SUPERFICIAL VELOCITY (cm/sec) : 4.9
SLURRY CONCENTRATION (wtZ) : 25.1
SPACE VELOCITY (1/kg-hr) : 10451
RECYCLE/FRESH FEED RATIO : 3.54
OIL/SLURRY CIRCULATION RATE (m3/hr) : 44.7
PROD.SEPARATOR GAS FLOWRATE <S0> + <S5> (ksmol/hr) : 86.82
PURGE GAS FLOW RATE <S0> (ksmol/hr) : 5.06

STREAM #	1	55	10	15	25*	25*	62	68
STREAM NAME	FRESH FEED	RECYCLE GAS	REACTOR FEED	REACTOR FEED	V/L SEP	V/L SEP	FLASH GAS	MEDH PRODUCT
ON-LINE GC#	1	2	1	2	2	1		
COMPONENT								
H2	58.88	29.36	35.51	35.54	27.41	27.32	5.73	—
CO	36.58	54.34	50.74	50.71	50.79	50.77	23.60	—
CO2	2.92	13.77	11.58	11.56	13.10	13.11	60.76	—
N2	0.17	1.21	1.01	1.00	1.13	1.13	0.37	—
CH4	0.09	0.71	0.58	0.58	0.66	0.66	0.92	—
H2O	0.00	0.00	0.00	0.00	0.03	0.04	0.12	1.05
CH3OH	0.00	0.50	0.43	0.38	6.97	6.90	7.43	95.58
DME	0.00	0.02	0.02	0.02	0.01	0.01	0.21	0.00
C2H5OH	—	—	—	—	—	—	—	0.76
C3OH'S	—	—	—	—	—	—	—	0.29
C4OH'S	—	—	—	—	—	—	—	0.21
C5OH'S	—	—	—	—	—	—	—	0.15
ALKATENES	—	—	—	—	—	—	—	0.00
ESTERS	—	—	—	—	—	—	—	0.45
ALDEHYDES	—	—	—	—	—	—	—	0.00
OIL	—	—	—	—	—	—	—	1.32
TOTAL :	98.65	99.90	99.87	99.79	100.10	99.95	99.13	100.00
DENS:g/cc	0.005	0.047	0.032	0.032	0.029	0.029	0.004	0.790
AV.MOL.WT	12.96	22.52	20.57	20.56	23.19	23.20	36.53	32.46
M3/hr	518.2	1832.6	2348.2	2351.5	2084.5	2083.4	4.8	—
ksmol/hr	23.12	81.76	104.76	104.91	93.00	92.95	0.21	6.06
l/hr:prod	—	—	—	—	—	—	—	248.73

* Compositions correspond to STREAM#32

LaPORTE LP-METHANOL PROCESS AVERAGE REPORT
CONVERSION-SELECTIVITY-PRODUCTIVITY

0000 24-May-85 - 2400 24-May-85

CONVERSIONS ACROSS REACTOR :

		<u>GC#1</u>	<u>GC#2</u>
HYDROGEN CONVERSION	(Z) :	31.7	31.6
CARBON MONOXIDE CONVERSION	(Z) :	11.2	11.2
CARBON DIOXIDE CONVERSION	(Z) :	-0.5	-0.5
RATIO H2 CONSUMED/CO CONSUMED	:	1.98	1.98

*** See next page for conversions as calc. by overall bal.

SELECTIVITIES :

		<u>ACROSS REACTOR</u> <u>GC Average</u>	<u>OVERALL</u> <u>%</u>
CO (+CO2) SELECTIVITY TO METHANOL	(Z) :	101.8	98.5
CO (+CO2) SELECTIVITY TO ETHANOL	(Z) :		0.5

% Methanol in flashed gas not measured
 Ethanol only measured in product flow

METHANOL PRODUCTIVITIES & YIELDS

<u>METH SOURCE</u>	<u>smol/hr-kg cat</u>	<u>kg/1000 Nm3 fresh feed</u>	<u>kg/1000 Nm3 reactor feed</u>
As calculated ACROSS REACTOR	26.76	372.3	82.0
As Net MeOH produced, OVERALL balance	26.24	365.1	80.5

REACTOR FEED $\{H_2/(CO+1.5CO_2)\}$:	0.52
REACTOR FEED $\{(H_2-CO_2)/(CO+CO_2)\}$:	0.39
APPROACH TO METHANOL EQUILIBRIUM (des.C) :	27.8
APPROACH TO WATER-GAS EQUILIBRIUM (des.C) :	n.a.
METHANOL COLLECTED AS % OF CALCULATED :	97.4
CALCULATED METHANOL PRODUCTION RATE (Ksmol/hr) :	6.02

LaPORTE LPHETHANOL PROCESS AVERAGE REPORT
MATERIAL BALANCE SUMMARY

0000 24-May-85 - 2400 24-May-85

COMPONENT BALANCE (IN-OUT)/IN :

STREAMS # STREAMS LOCATION COMPONENT :	[PURE GASES - 13 FRESH FEED GAS	[(1+55)-15] REACTOR FEED	[25 - (50+51+62+68)] REACTOR EFFLUENT
	<Z diff.>	<Z diff.>	<Z diff.>
H2	-3.05297	0.89342	-0.05690
CO	-0.70461	-0.60240	0.11929
CO2	-97.98210	-1.62743	1.87560
N2	-183.33000	-2.35701	-4.48890
CH4	n.a.	-1.51079	-21.18570
H2O	—	n.a.	-359.45300
CH3OH	—	1.93525	2.64467

OVERALL ELEMENTAL BALANCE (Kg-atoms/hr) :

STREAM # STREAM NAME	INPUTS		OUTPUTS				(IN-OUT)/IN
	15 REACTOR FEED	55 RECYCLE	50 PURGE GAS	62 FLASH GAS	68 MeOH PRODUCT	TOTAL	Z
CARBON:							
CO	53.2002	44.4258	2.7487	0.0505	—	47.2250	11.2316
CO2	12.1255	11.2555	0.6964	0.1301	—	12.0820	0.3590
CH3OH	0.3979	0.4049	0.0251	0.0159	5.8633	6.3092	-1485.5000
OTHERS	0.6266	0.5962	0.0369	0.0024	0.1756	0.8111	-29.4340
TOTAL C	66.3503	56.6824	3.5070	0.1989	6.0389	66.4272	-0.1159
HYDROGEN:							
H2	74.5628	48.0121	2.9706	0.0245	—	51.0072	31.5916
H2O	0.0000	0.0000	0.0000	0.0005	0.2291	0.2297	n.a.
OTHERS	4.1365	4.0424	0.2501	0.0742	23.9052	28.2720	-583.4760
TOTAL H	78.6993	52.0546	3.2207	0.0992	24.1344	79.5089	-1.0287
OXYGEN:							
TOTAL O	77.8682	67.3606	4.1677	0.3273	6.0695	77.9251	-0.0731
NITROGEN:							
TOTAL N	2.1068	1.9804	0.1225	0.0016	—	2.1045	0.1105
TOTAL MASS FLOW (kg/hr)	2156.4400	1840.7500	113.8900	7.8213	193.9720	2156.4400	0.0002

REACTOR GAS BALANCE (OUT/IN) :

	GC#1	GC#2
MASS BALANCE, (Z) :	100.000	100.000
ELEMENTAL BALANCE, (Z) :		
CARBON	100.047	100.241
HYDROGEN	100.363	100.977
OXYGEN	100.166	100.314
NITROGEN	99.969	100.117

LaPORTE LP-METHANOL PROCESS AVERAGE REPORT
ENTRAINED MODE
PROCESS VARIABLES & ANALYTICAL SUMMARY

DATE :	22-Jun-85
TIME :	04:15 PM
TIME INTERVAL:	FROM: 0000 25-May
	TO: 2400 25-May
NUMBER OF AVERAGED HOURS :	23
RUN ID NUMBER :	EU-X754
FEED GAS TYPE:	CO-RICH GAS
REACTOR FEED GAS INLET TEMP. (des.C) :	145.6
OIL/SLURRY INLET TEMP. (des.C) :	245.1
AVE. REACTOR TEMPERATURE (des.C) :	249.9
REACTOR OUTLET TEMP. (des.C) :	247.8
REACTOR GAS INLET PRESSURE (kPa) :	5471
PRIMARY SEPARATOR GAS PRESSURE (kPa) :	5278
GAS SUPERFICIAL VELOCITY (cm/sec) :	9.4
LIQUID SUPERFICIAL VELOCITY (cm/sec) :	4.9
SLURRY CONCENTRATION (wt%) :	25.2
SPACE VELOCITY (1/ks-hr) :	10431
RECYCLE/FRESH FEED RATIO :	3.53
OIL/SLURRY CIRCULATION RATE (m3/hr) :	44.7
PROD.SEPARATOR GAS FLOWRATE <S0> + <S5> (ksmol/hr) :	86.83
PURGE GAS FLOW RATE <S0> (ksmol/hr) :	5.24

STREAM #	1	SS	10	15	25X	25X	62	68
STREAM NAME	FRESH FEED	RECYCLE GAS	REACTOR FEED	REACTOR FEED	V/L SEP	V/L SEP	FLASH GAS	MEDH PRODUCT
ON-LINE GC#	1	2	1	2	2	1		
COMPONENT								
	<MOL>	<MOL>	<MOL>	<MOL>	<MOL>	<MOL>	<MOL>	<WT>
H2	58.74	29.43	35.46	35.65	27.54	27.18	5.73	—
CO	36.62	54.40	50.74	50.79	50.81	50.78	23.60	—
CO2	3.02	13.72	11.56	11.56	13.05	13.08	60.76	—
N2	0.16	1.13	0.93	0.93	1.05	1.06	0.33	—
CH4	0.10	0.72	0.59	0.59	0.67	0.67	0.92	—
H2O	0.00	0.00	0.00	0.00	0.03	0.05	0.12	1.02
CH3OH	0.00	0.50	0.43	0.39	6.94	6.87	7.43	95.56
DME	0.00	0.02	0.02	0.02	0.01	0.01	0.21	0.00
C2H5OH	—	—	—	—	—	—	—	0.77
C3OH'S	—	—	—	—	—	—	—	0.32
C4OH'S	—	—	—	—	—	—	—	0.20
C5OH'S	—	—	—	—	—	—	—	0.15
ALKAHENES	—	—	—	—	—	—	—	0.00
ESTERS	—	—	—	—	—	—	—	0.66
ALDEHYDES	—	—	—	—	—	—	—	0.00
OIL	—	—	—	—	—	—	—	1.32
TOTAL :	98.63	99.93	99.74	99.92	100.10	99.71	99.13	100.00
DENS,rs/cc	0.005	0.047	0.032	0.032	0.029	0.029	0.004	0.790
AV.MOL.WT	13.01	22.49	20.57	20.54	23.14	23.22	36.53	32.47
Mm3/hr	518.1	1828.9	2344.3	2347.0	2082.6	2076.1	4.8	—
ksmol/hr	23.11	81.59	104.59	104.71	92.91	92.62	0.21	5.92
l/hr=prod	—	—	—	—	—	—	—	243.37

* Compositions correspond to STREAM#32

**LaPORTE LPMETHANOL PROCESS AVERAGE REPORT
CONVERSION-SELECTIVITY-PRODUCTIVITY**

0000 25-May-85 - 2400 25-May-85

CONVERSIONS ACROSS REACTOR :

		<u>GC#1</u>	<u>GC#2</u>
HYDROGEN CONVERSION	(Z) :	32.1	31.5
CARBON MONOXIDE CONVERSION	(Z) :	11.4	11.2
CARBON DIOXIDE CONVERSION	(Z) :	-0.1	-0.2
RATIO H2 CONSUMED/CO CONSUMED	:	1.97	1.97

*** See next page for conversions as calc. by overall bal.

SELECTIVITIES :

	<u>ACROSS REACTOR GC Average</u>	<u>OVERALL ±</u>
CO (HCO2) SELECTIVITY TO METHANOL (Z) :	99.9	98.0
CO (HCO2) SELECTIVITY TO ETHANOL (Z) :		0.5

* Methanol in flashed gas not measured
Ethanol only measured in product flow

METHANOL PRODUCTIVITIES & YIELDS

<u>METH SOURCE</u>	<u>smol/hr-kg cat</u>	<u>kg/1000 Nm3 fresh feed</u>	<u>kg/1000 Nm3 reactor feed</u>
As calculated ACROSS REACTOR	26.58	369.9	81.7
As Net MeOH produced, OVERALL balance	25.68	357.3	78.9

REACTOR FEED (H2/(CO+1.5CO2)) :	0.52
REACTOR FEED (H2-CO2)/(CO+CO2) :	0.39
APPROACH TO METHANOL EQUILIBRIUM (des.C) :	28.2
APPROACH TO WATER-GAS EQUILIBRIUM (des.C) :	n.a.
METHANOL COLLECTED AS Z OF CALCULATED :	95.9
CALCULATED METHANOL PRODUCTION RATE (Ksmol/hr) :	5.98

LaPORTE LPHETHANOL PROCESS AVERAGE REPORT
MATERIAL BALANCE SUMMARY

0000 25-May-85 - 2400 25-May-85

COMPONENT BALANCE (IN-OUT)/IN :

STREAMS # STREAMS LOCATION COMPONENT :	[PURE GASES - 1] FRESH FEED GAS	[(1+55)-15] REACTOR FEED	[25 - (50+51+62+68)] REACTOR EFFLUENT
	<Z diff.>	<Z diff.>	<Z diff.>
H2	-1.97714	0.69827	0.06619
CO	-0.71409	-0.61814	-0.06332
CO2	-94.05890	-1.79096	1.71364
H2	-153.74600	-1.99277	-5.88258
CH4	n.a.	-0.49542	-21.78520
H2O		n.a.	-237.91800
CH3OH		-0.16965	4.13311

OVERALL ELEMENTAL BALANCE (Ks-atoms/hr) :

STREAM # STREAM NAME	INPUTS		OUTPUTS				(IN-OUT)/IN
	15 REACTOR FEED	55 RECYCLE	50 PURGE GAS	62 FLASH GAS	68 MeOH PRODUCT	TOTAL	
CARBON:							Z
CO	53.1782	44.3876	2.8480	0.0506		47.2862	11.0797
CO2	12.1081	11.1982	0.7185	0.1303		12.0470	0.5041
CH3OH	0.4046	0.4039	0.0259	0.0159	5.7357	6.1815	-1427.6700
OTHERS	0.6310	0.6057	0.0389	0.0024	0.1765	0.8235	-30.5136
TOTAL C	66.3219	56.5954	3.6313	0.1993	5.9122	66.3382	-0.0246
HYDROGEN:							
H2	74.6598	48.0322	3.0819	0.0246		51.1386	31.5045
H2O	0.0000	0.0000	0.0000	0.0005	0.2176	0.2181	n.a.
OTHERS	4.1775	4.0756	0.2615	0.0743	23.3976	27.8090	-565.6780
TOTAL H	78.8374	52.1078	3.3434	0.0994	23.6152	79.1658	-0.4165
OXYGEN:							
TOTAL O	77.8166	67.2063	4.3121	0.3280	5.9360	77.7824	0.0439
NITROGEN:							
TOTAL N	1.9507	1.8395	0.1180	0.0016		1.9591	-0.4295
TOTAL MASS FLOW (ks/hr)	2150.2600	1834.9100	117.7320	7.8379	189.7900	2150.2700	-0.0003

REACTOR GAS BALANCE (OUT/IN) :

	GC81	GC82
MASS BALANCE, (Z) :		
ELEMENTAL BALANCE, (Z) :	100.000	100.000
CARBON	99.826	100.120
HYDROGEN	99.899	100.921
OXYGEN	99.943	100.170
NITROGEN	100.917	99.677

LaPORTE LPMETHANOL PROCESS AVERAGE REPORT
ENTRAINED MODE
PROCESS VARIABLES & ANALYTICAL SUMMARY

DATE : 22-Jun-85
TIME : 04:23 PH
TIME INTERVAL: FROM: 0000 26-May
TO: 2400 26-May
24
NUMBER OF AVERAGED HOURS :
RUN ID NUMBER : EU-X754
FEED GAS TYPE: CO-RICH GAS
REACTOR FEED GAS INLET TEMP. (des.C) : 145.4
OIL/SLURRY INLET TEMP. (des.C) : 244.9
AVE. REACTOR TEMPERATURE (des.C) : 249.9
REACTOR OUTLET TEMP. (des.C) : 247.6
REACTOR GAS INLET PRESSURE (kPa) : 5473
PRIMARY SEPARATOR GAS PRESSURE (kPa) : 5279
GAS SUPERFICIAL VELOCITY (cm/sec) : 9.5
LIQUID SUPERFICIAL VELOCITY (cm/sec) : 4.9
SLURRY CONCENTRATION (wt%): 25.2
SPACE VELOCITY (1/k_s-hr) : 10467
RECYCLE/FRESH FEED RATIO : 3.54
OIL/SLURRY CIRCULATION RATE (m³/hr) : 44.7
PROD.SEPARATOR GAS FLOWRATE <S0> + <S5> (kmol/hr) : 87.06
PURGE GAS FLOW RATE <S0> (kmol/hr) : 5.27

STREAM #	1	55	10	15	25*	25*	62	48
STREAM NAME	FRESH FEED	RECYCLE GAS	REACTOR FEED	REACTOR FEED	V/L SEP	V/L SEP	FLASH GAS	MECH PRODUCT
ON-LINE GC#	1	2	1	2	2	1		
COMPONENT								
	<MOL>	<MOL>	<MOL>	<MOL>	<MOL>	<MOL>	<MOL>	<WT>
H2	58.77	29.55	35.66	35.66	27.63	27.54	5.73	—
CO	36.62	54.36	50.77	50.80	50.83	50.81	23.60	—
CO2	3.11	13.92	11.73	11.75	13.26	13.27	60.76	—
N2	0.12	0.85	0.70	0.70	0.79	0.80	0.37	—
CH4	0.10	0.75	0.62	0.62	0.69	0.70	0.92	—
H2O	0.00	0.00	0.00	0.00	0.05	0.06	0.12	1.03
CH3OH	0.00	0.50	0.43	0.38	6.93	6.87	7.43	95.61
DME	0.00	0.02	0.01	0.02	0.01	0.01	0.21	0.00
C2H5OH	—	—	—	—	—	—	—	0.75
C3OH'S	—	—	—	—	—	—	—	0.31
C4OH'S	—	—	—	—	—	—	—	0.19
C5OH'S	—	—	—	—	—	—	—	0.14
ALKAHENES	—	—	—	—	—	—	—	0.00
ESTERS	—	—	—	—	—	—	—	0.65
ALDEHYDES	—	—	—	—	—	—	—	0.00
OIL	—	—	—	—	—	—	—	1.32
TOTAL :	98.73	99.94	99.92	99.93	100.18	100.05	99.13	100.00
DENS _{g/cc}	0.005	0.047	0.032	0.032	0.029	0.029	0.004	0.790
AV.MOL.WT	13.03	22.49	20.56	20.56	23.15	23.17	36.53	32.46
M ³ /hr	518.6	1833.4	2355.1	2355.1	2091.6	2090.2	5.0	—
kmol/hr	23.13	81.80	105.07	105.07	93.31	93.25	0.22	6.07
l/hrprod	—	—	—	—	—	—	—	249.36

* Compositions correspond to STREAM#32

LaPORTE LPMETHANOL PROCESS AVERAGE REPORT
CONVERSION-SELECTIVITY-PRODUCTIVITY

0000 26-May-85 - 2400 26-May-85

CONVERSIONS ACROSS REACTOR :

		<u>GC#1</u>	<u>GC#2</u>
HYDROGEN CONVERSION	(Z) :	31.5	31.2
CARBON MONOXIDE CONVERSION	(Z) :	11.2	11.1
CARBON DIOXIDE CONVERSION	(Z) :	-0.4	-0.2
RATIO H2 CONSUMED/CO CONSUMED	:	1.98	1.97

*** See next page for conversions as calc. by overall bal.

SELECTIVITIES :

	<u>ACROSS REACTOR</u> <u>GC Average</u>	<u>OVERALL</u> <u>*</u>
CO (+CO2) SELECTIVITY TO METHANOL (Z) :	101.5	97.7
CO (+CO2) SELECTIVITY TO ETHANOL (Z) :		0.5

* Methanol in flashed gas not measured
Ethanol only measured in product flow

METHANOL PRODUCTIVITIES & YIELDS

<u>MEDH SOURCE</u>	<u>kmol/hr-kg cat</u>	<u>kg/1000 Na3 fresh feed</u>	<u>kg/1000 Na3 reactor feed</u>
As calculated ACROSS REACTOR	26.69	371.1	81.7
As Net MeOH produced, OVERALL balance	26.32	366.0	80.6

REACTOR FEED (H2/(CO+1.5CO2)) :	0.52
REACTOR FEED ((H2-CO2)/(CO+CO2)) :	0.38
APPROACH TO METHANOL EQUILIBRIUM (des.C) :	28.5
APPROACH TO WATER-GAS EQUILIBRIUM (des.C) :	n.a.
METHANOL COLLECTED AS % OF CALCULATED :	97.9
CALCULATED METHANOL PRODUCTION RATE (Kmol/hr) :	6.01

LaPORTE LPMETHANOL PROCESS AVERAGE REPORT
MATERIAL BALANCE SUMMARY

0000 26-May-85 - 2400 26-May-85

COMPONENT BALANCE (IN-OUT)/IN :

STREAMS # STREAMS LOCATION COMPONENT :	[PURE GASES - 13 FRESH FEED GAS	[(1455)-15] REACTOR FEED	[25 - (50+51+62+68)] REACTOR EFFLUENT
	<Z diff.>	<Z diff.>	<Z diff.>
H2	-2.43432	0.79614	0.14585
CO	-0.88195	-0.83117	0.21924
CO2	-93.16790	-1.99664	2.03403
N2	-103.28000	-2.58805	-6.74562
CH4	n.a.	-1.65062	-21.70000
H2O	—	100.00000	-160.79600
CH3OH	—	0.72348	2.08015

OVERALL ELEMENTAL BALANCE (Ks-atoms/hr) :

STREAM # STREAM NAME	INPUTS		OUTPUTS				(IN-OUT)/IN
	15 REACTOR FEED	55 RECYCLE	50 PURGE GAS	62 FLASH GAS	68 MeOH PRODUCT	TOTAL	Z
CARBON:							
CO	53.3730	44.4613	2.8630	0.0525	—	47.3767	11.2345
CO2	12.3427	11.3822	0.7329	0.1350	—	12.2501	0.7499
CH3OH	0.4031	0.4056	0.0261	0.0165	5.8799	6.3282	-1470.0200
OTHERS	0.6666	0.6301	0.0406	0.0025	0.1752	0.8484	-27.2729
TOTAL C	66.7853	56.8792	3.6626	0.2065	6.0552	66.8035	-0.0272
HYDROGEN:							
H2	74.9387	48.3465	3.1132	0.0255	—	51.4851	31.2970
H2O	0.0000	0.0000	0.0000	0.0005	0.2252	0.2257	n.a.
OTHERS	4.3187	4.1778	0.2690	0.0770	23.9713	28.4951	-559.8100
TOTAL H	79.2574	52.5243	3.3822	0.1030	24.1965	80.2060	-1.1968
OXYGEN:							
TOTAL O	78.4814	67.6488	4.3561	0.3398	6.0841	78.4288	0.0671
NITROGEN:							
TOTAL N	1.4790	1.3863	0.0893	0.0016	—	1.4772	0.1238
TOTAL MASS FLOW (ks/hr)	2160.2500	1839.2400	118.4340	8.1196	194.4650	2160.2500	-0.0001

REACTOR GAS BALANCE (OUT/IN) :

	GC#1	GC#2
MASS BALANCE, (Z) :	100.000	100.000
ELEMENTAL BALANCE, (Z) :		
CARBON	100.044	100.170
HYDROGEN	100.392	101.088
OXYGEN	100.164	100.251
NITROGEN	101.403	100.106