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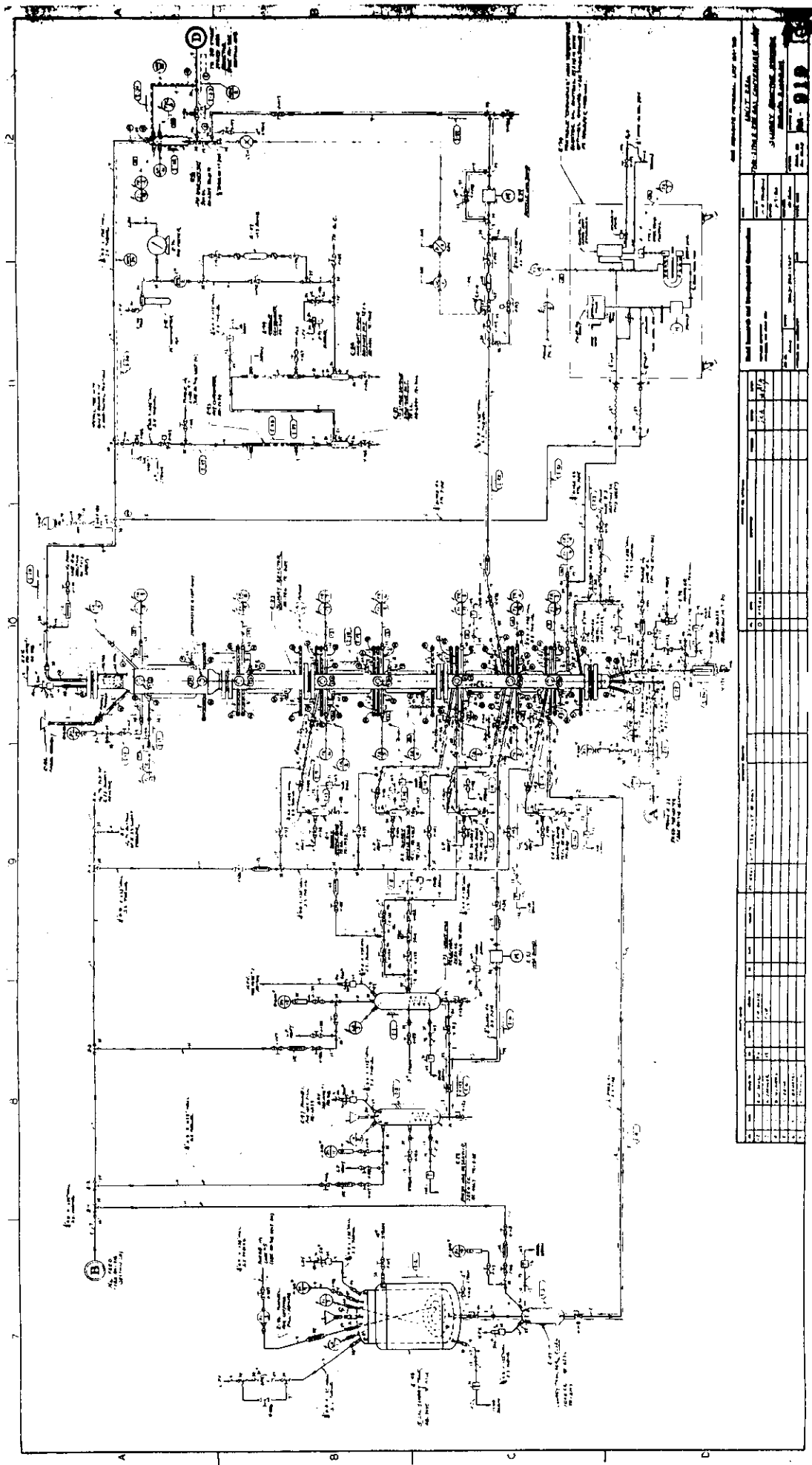
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**A P P E N D I X    A**

**DRAWINGS FOR TWO-STAGE BENCH-SCALE PILOT PLANT**

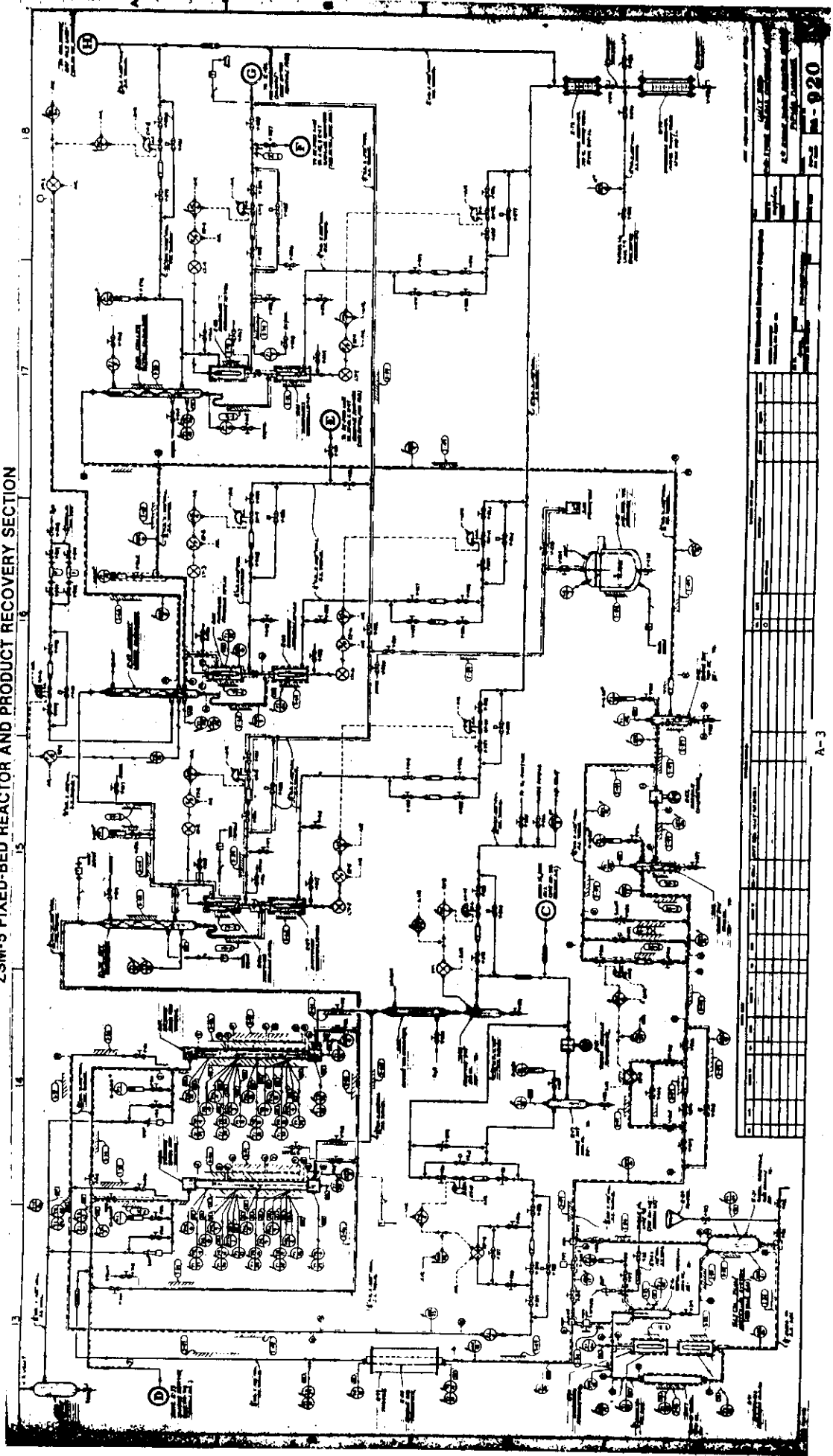


FIGURE A-2  
 ENGINEERING FLOW, AND PIPING AND INSTRUMENTATION DIAGRAM:  
 SLURRY F-T REACTOR SECTION



REVISIONS		DATE		BY		CHECKED		APPROVED	
NO.	DESCRIPTION	DATE	BY	DATE	BY	DATE	BY	DATE	BY
1	ISSUED FOR CONSTRUCTION								
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FIGURE A-3  
 ENGINEERING FLOW, AND PIPING AND INSTRUMENTATION DIAGRAM:  
 ZSM-5 FIXED-BED REACTOR AND PRODUCT RECOVERY SECTION





**FIGURE A-4**  
**ENGINEERING FLOW, AND PIPING AND INSTRUMENTATION DIAGRAM:**  
**LIQUID HYDROCARBON PRODUCT DISTILLATION SECTION**

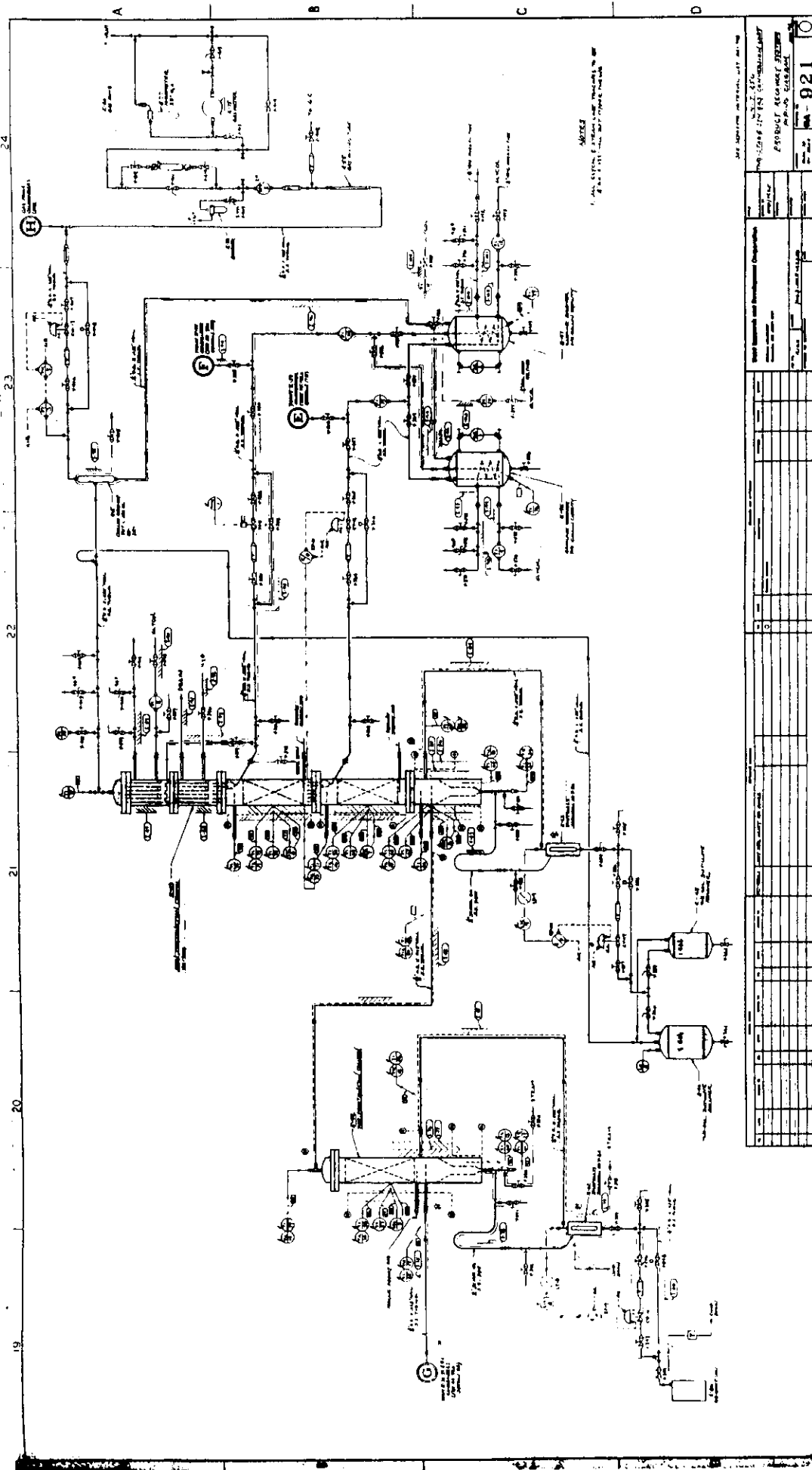


FIGURE A-5  
 SLURRY F-T REACTOR ASSEMBLY AND DETAILS

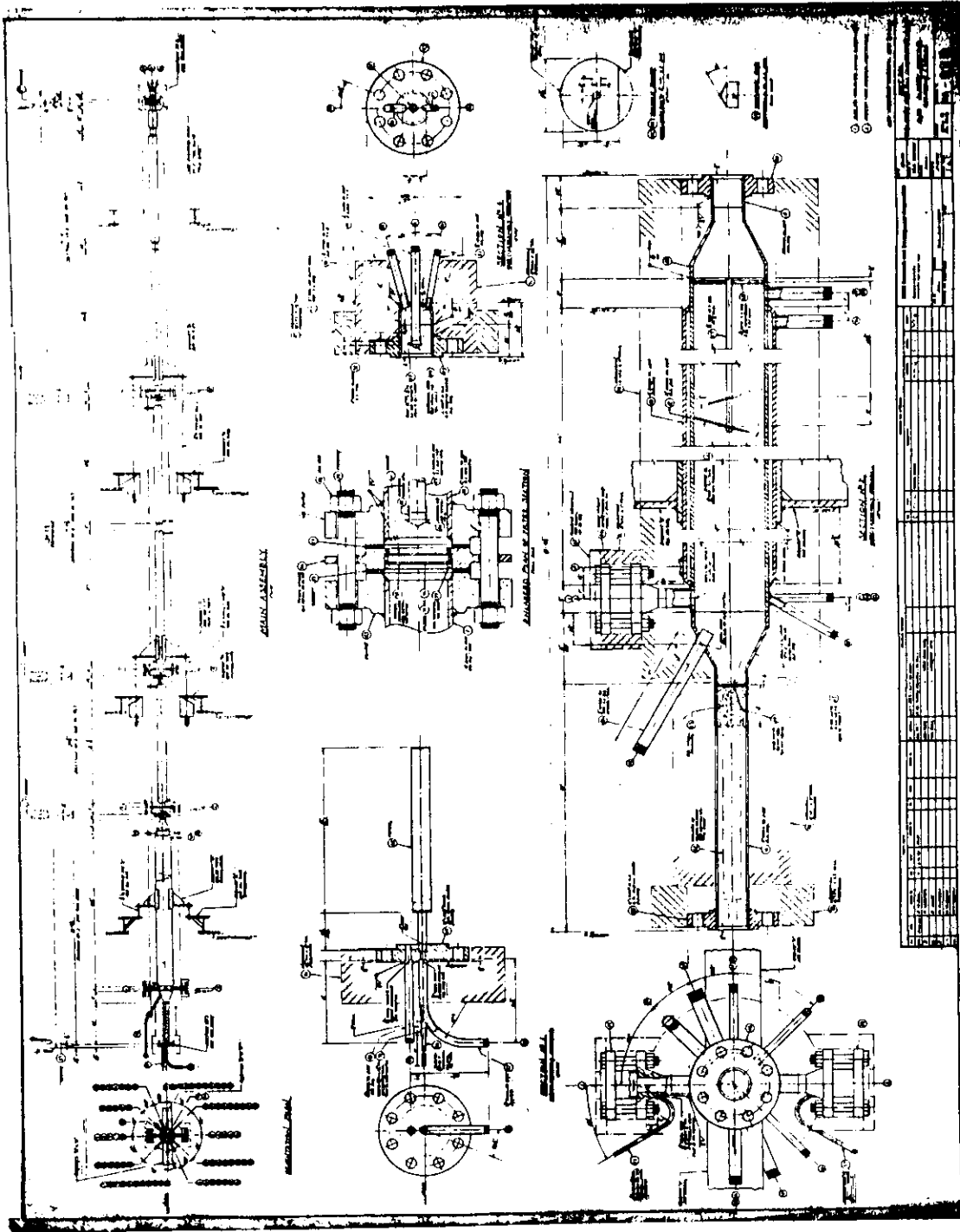


FIGURE A-6  
 SLURRY F-T REACTOR DETAILS

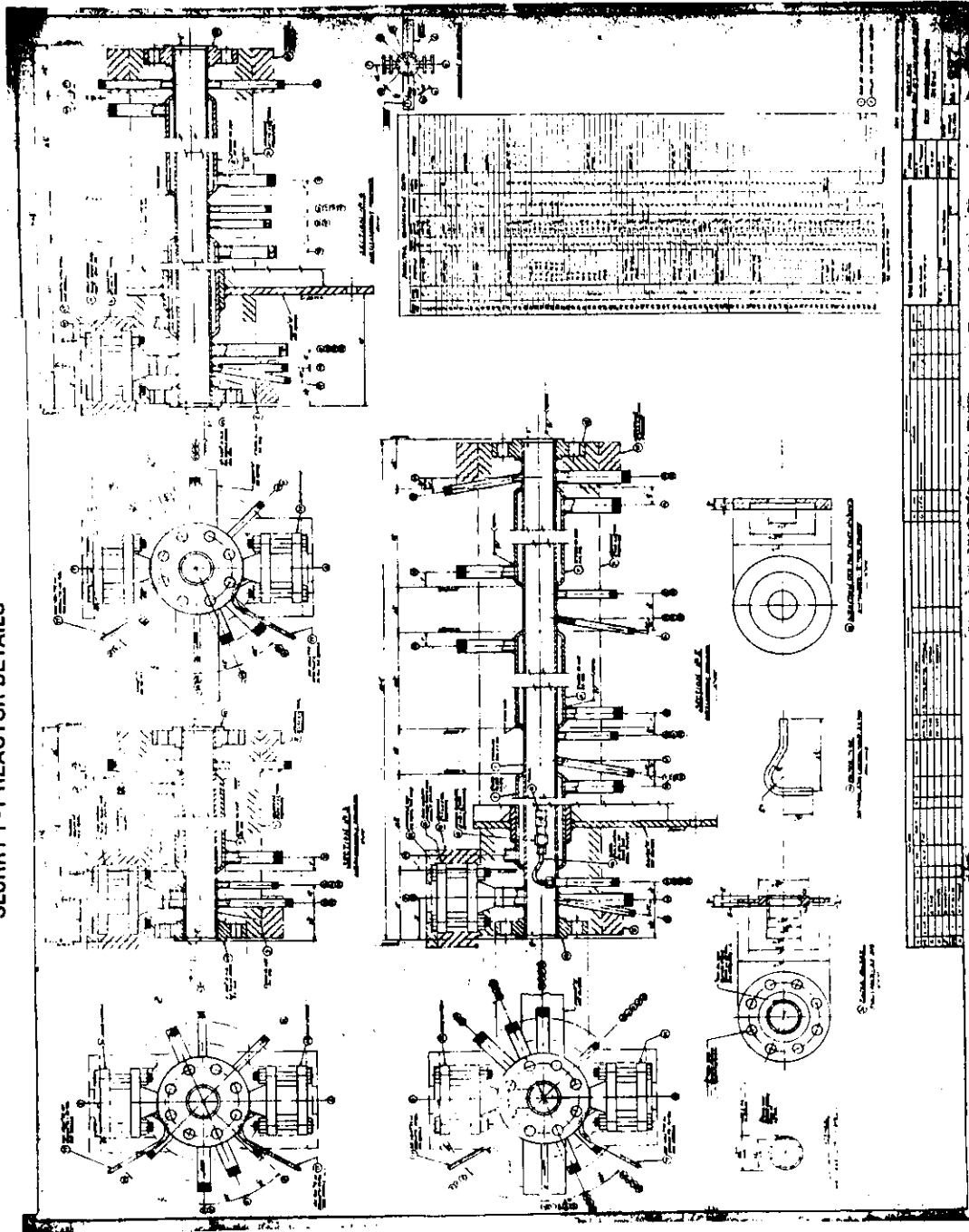
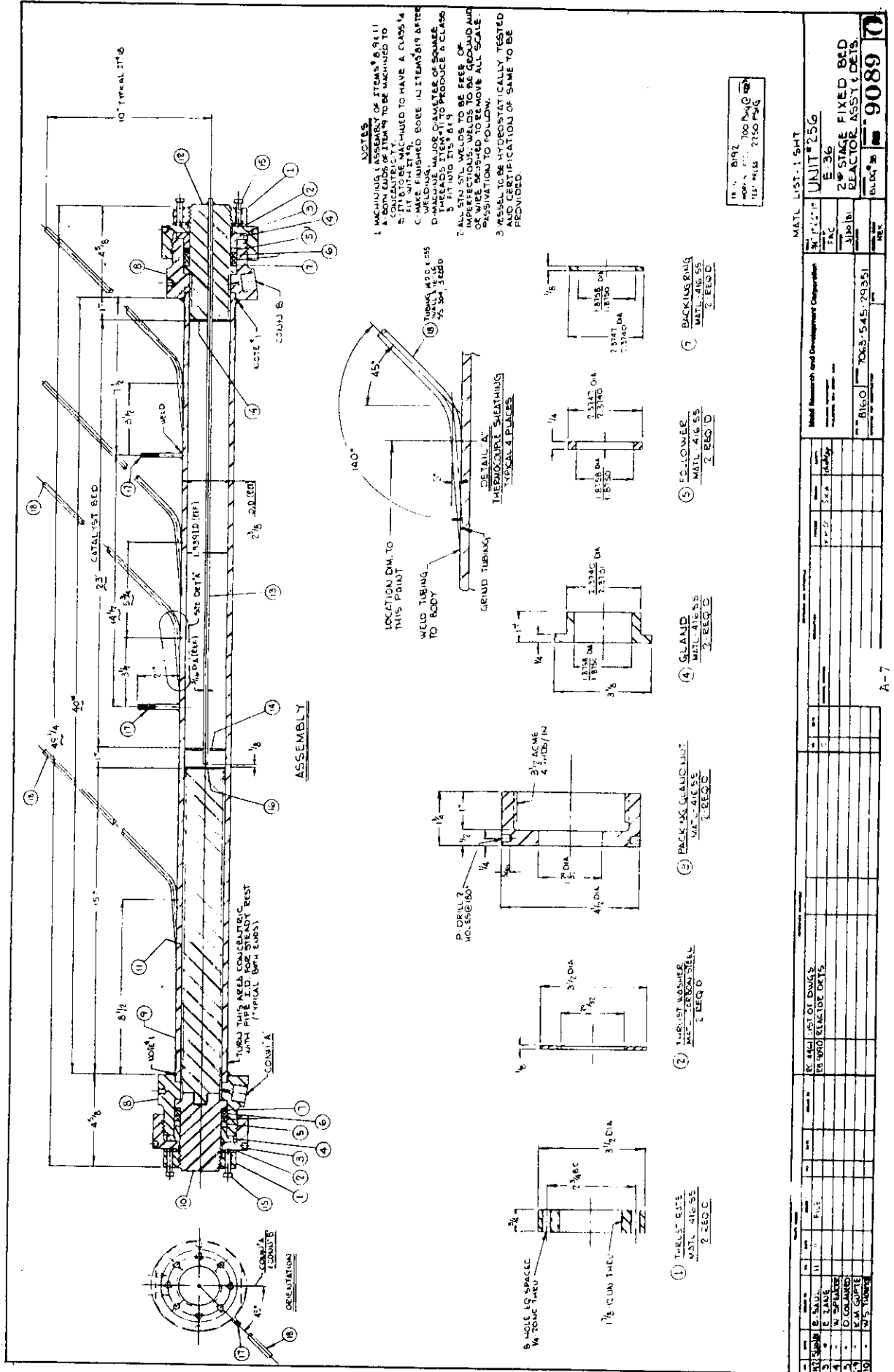


FIGURE A-7: SECOND-STAGE FIXED-BED REACTOR ASSEMBLY AND DETAILS



**NOTES:**

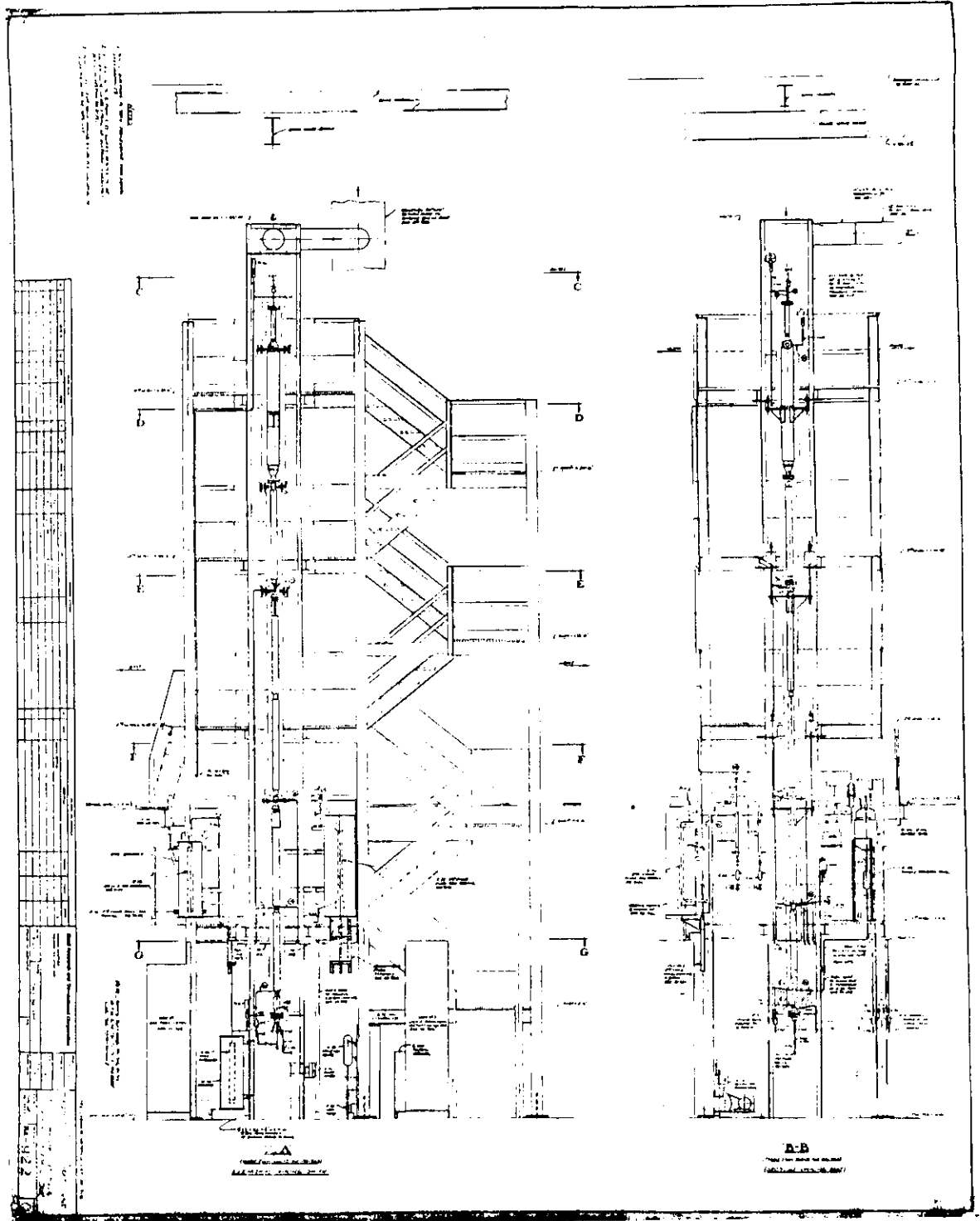
1. MACHINE ALL SURFACES OF ITEMS 8 & 11 TO CONCENTRICITY. ALL SURFACES OF ITEMS 8 & 11 TO BE MACHINED TO CONCENTRICITY.
2. FIT TO BE MACHINED TO HAVE A CLASS 14.
3. MAKE FINISHED BORE IN ITEMS 8 & 11 AFTER WELDING. ALL SURFACES OF ITEMS 8 & 11 TO BE MACHINED TO CONCENTRICITY.
4. THREADS IN ITEM 11 TO PRODUCE A CLASS 5 FIT INTO ITEM 8 & 11.
5. ALL SURFACES TO BE FREE OF DEFECTS AND TO BE MACHINED TO CONCENTRICITY.
6. WIRE BRUSHED TO REMOVE ALL SCALE. PASSIVATION TO FOLLOW.
7. RESSSEL TO BE HYDROSTATICALLY TESTED AND CERTIFICATION OF SAME TO BE PROVIDED.

REV. 10/1977  
 100% NICKEL  
 115° F. PRESS. 21500 P.S.I.G.

MATERIAL LIST		UNIT #256	
NO.	DESCRIPTION	QTY.	REMARKS
1	INLET GATE	2	REQ. C
2	INLET VALVE	2	REQ. C
3	INLET GATE	2	REQ. C
4	INLET VALVE	2	REQ. C
5	INLET GATE	2	REQ. C
6	INLET VALVE	2	REQ. C
7	BACKING RING	2	REQ. D
8	PACKING GLAND	2	REQ. D
9	PACKING GLAND	2	REQ. D
10	PACKING GLAND	2	REQ. D
11	PACKING GLAND	2	REQ. D
12	PACKING GLAND	2	REQ. D
13	PACKING GLAND	2	REQ. D
14	PACKING GLAND	2	REQ. D
15	PACKING GLAND	2	REQ. D
16	PACKING GLAND	2	REQ. D
17	PACKING GLAND	2	REQ. D
18	PACKING GLAND	2	REQ. D
19	PACKING GLAND	2	REQ. D
20	PACKING GLAND	2	REQ. D
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22	PACKING GLAND	2	REQ. D
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33	PACKING GLAND	2	REQ. D
34	PACKING GLAND	2	REQ. D
35	PACKING GLAND	2	REQ. D
36	PACKING GLAND	2	REQ. D
37	PACKING GLAND	2	REQ. D
38	PACKING GLAND	2	REQ. D
39	PACKING GLAND	2	REQ. D
40	PACKING GLAND	2	REQ. D
41	PACKING GLAND	2	REQ. D
42	PACKING GLAND	2	REQ. D
43	PACKING GLAND	2	REQ. D
44	PACKING GLAND	2	REQ. D
45	PACKING GLAND	2	REQ. D
46	PACKING GLAND	2	REQ. D
47	PACKING GLAND	2	REQ. D
48	PACKING GLAND	2	REQ. D
49	PACKING GLAND	2	REQ. D
50	PACKING GLAND	2	REQ. D

FIGURE A-8

ELEVATION VIEWS OF THE BENCH-SCALE PILOT PLANT



8-4

Table B-1  
**First-Stage Fischer-Tropsch Slurry Reactor**  
**Operating Conditions and Material Balances**  
**(Second-Stage Not-Operative)**  
**(Run CT-256-1)**

(Nitrogen-Free Basis)					
M.B. No.	1- 1	1- 2	1- 3	1- 4	1- 6
Days On-stream	2.3	3.3	4.4	5.4	11.8
<b>First-Stage Conditions:</b>					
Charge H <sub>2</sub> /CO (Molar)	0.719	0.734	0.752	0.627	0.603
Temperature, °C	260	260	260	260	265
Pressure, MPa	1.136	1.136	1.136	1.136	1.136
Feed Sup. Vel., cm/s	2.250	2.250	2.250	2.060	1.767
Space Vel., NL/gFe-hr	8.54	9.12	9.20	8.42	9.96
N <sub>2</sub> in Feed, Mol %	11.0	11.3	11.6	12.6	14.6
<b>Conversions, Mol % :</b>					
H <sub>2</sub>	49.95	44.39	45.57	47.86	38.51
CO	68.14	60.35	54.00	53.34	44.81
H <sub>2</sub> +CO	60.53	53.59	50.38	51.23	42.44
<b>Yields, Wt % of Products :</b>					
Hydrocarbons (1)	17.81	16.12	14.54	13.24	11.04
CO <sub>2</sub>	47.09	41.85	39.31	38.72	31.26
H <sub>2</sub> O (1)	0.85	1.00	0.66	0.62	0.31
H <sub>2</sub>	2.58	2.84	2.74	2.28	2.65
CO	31.67	38.20	42.75	45.14	54.74
Total	100	100	100	100	100
Bal Recovery, Wt % of Charge:	95.58	98.53	102.05	98.84	96.55
gHC/Nm <sup>3</sup> (H <sub>2</sub> +CO) conv.:	214	224	221	204	203
(H/C) Atomic Ratio in HC :	2.19	2.20	2.21	2.22	2.13
<b>Selectivities, Wt % of HC :</b>					
Methane	5.69	5.79	6.54	6.62	8.64
Ethene	3.39	3.57	3.77	4.05	4.65
Ethane	1.48	1.39	1.42	1.47	1.59
Propene	5.97	6.05	6.59	6.90	7.84
Propane	0.85	0.87	0.95	1.03	1.31
Butenes	4.93	5.06	5.54	5.92	6.60
i-Butane	0.06	0.07	0.06	0.06	0.05
n-Butane	0.92	0.95	1.05	1.11	1.43
C <sub>5</sub> - C <sub>11</sub>	23.72	25.18	29.65	32.87	14.68
C <sub>12</sub> + (Excl. Rx. Wax)	16.57	20.73	18.63	18.17	0.00
Light Hydrocarbons (3)	0.00	0.00	0.00	0.00	28.42
Heavy Hydrocarbons (4)	0.00	0.00	0.00	0.00	17.79
Slurry Rx.-Wax	33.00	25.00	19.00	14.00	7.00
Total	100	100	100	100	100
<b>C<sub>5</sub> - C<sub>11</sub> PONA, Wt % :</b>					
Paraffins	21.89	22.62	22.15	19.72	(2)
Olefins	78.11	77.38	77.85	80.28	(2)
Naphthenes	0.00	0.00	0.00	0.00	(2)
Aromatics	0.00	0.00	0.00	0.00	(2)

(1) Including Oxygenates

(2) Not Available

(3) Collected in Chilled and Ambient Condensers

(4) collected in Hot Condenser

Table B-2  
 First-Stage Fischer-Tropsch Slurry Reactor  
 Operating Conditions and Material Balances  
 (Based On Inter-Reactor Sample)  
 (Run CT-256-1)

(Nitrogen-Free Basis)					
M.B. No.	1- 30	1- 31	1- 34	1- 41	1- 43
Days On-stream	41.4	42.4	45.4	52.4	54.3
First-Stage Conditions:					
Charge H <sub>2</sub> /CO (Molar)	0.672	0.679	0.669	0.656	0.651
Temperature, °C	267	269	269	267	268
Pressure, MPa	1.48	1.48	1.48	1.48	1.48
Feed Sup. Vel., cm/s	1.737	1.761	1.767	1.691	1.666
Space Vel., NL/gFe-hr	5.244	5.318	5.335	5.260	5.183
N <sub>2</sub> in Feed, Mol %	13.0	13.0	13.0	10.8	11.4
Conversions, Mol % :					
H <sub>2</sub>	59.76	60.29	63.21	65.07	62.04
CO	46.70	49.99	72.45	72.88	67.29
H <sub>2</sub> +CO	51.95	54.15	68.74	69.79	65.22
Yields, Wt % of Products :					
Hydrocarbons (1)	11.75	13.66	18.01	18.45	15.80
CO <sub>2</sub>	35.13	34.53	54.94	54.58	53.82
H <sub>2</sub> O (1)	0.00	0.00	0.00	0.00	0.00
H <sub>2</sub>	1.88	1.94	1.64	1.55	1.57
CO	51.24	49.88	25.42	25.42	28.81
Total	100.00	100.00	100.00	100.00	100.00
Bal Recovery, Wt % of Charge:	99.15	95.53	103.33	101.80	108.35
gHC/Nm <sup>3</sup> (H <sub>2</sub> +CO) conv.:	186	199	220	221	215
(H/C) Atomic Ratio in HC :	2.23	2.22	2.24	2.23	2.26
Selectivities, Wt % of HC :					
Methane	8.50	7.62	8.33	7.92	9.70
Ethene	4.31	3.62	3.64	4.37	5.08
Ethane	1.56	1.34	2.14	1.89	2.21
Propene	7.08	5.82	7.84	7.59	9.03
Propane	1.57	1.32	1.71	1.71	2.08
Butenes	5.94	4.84	6.82	6.32	7.71
i-Butane	0.07	0.07	0.08	0.11	0.00
n-Butane	1.52	1.28	1.66	1.61	2.03
C <sub>5</sub> - C <sub>11</sub> (2)	11.19	8.45	17.30	14.87	17.92
Light Hydrocarbons (3)	25.44	30.41	21.95	24.37	19.18
Heavy Hydrocarbons (4)	26.82	29.23	22.53	23.24	18.15
Slurry Rx.-Wax	6.00	6.00	6.00	6.00	6.00
Total	100.00	100.00	100.00	100.00	100.00

(1) Including Oxygenates

(2) In Gas Phase Only

(3) Collected in Chilled and Ambient Condensers

(4) Collected in Hot Condenser

Table B-3  
Composition of Hydrocarbon Products from  
First-Stage Slurry F-T Reactor  
(Run CT-256-1)

M.B. No.	1-1	1-2	1-3	1-4	1-6	(1)	(1)	(1)	(1)	(1)
Days On-stream	2.3	3.3	4.4	5.4	11.8	41.4	42.4	45.4	52.4	54.3
METHANE	5.69	5.79	6.54	6.62	8.64	8.50	7.62	8.33	7.92	9.70
ETHENE	3.39	3.57	3.77	4.05	4.65	4.31	3.62	3.64	4.37	5.08
ETHANE	1.48	1.39	1.42	1.47	1.59	1.56	1.34	2.14	1.89	2.21
PROPENE	5.97	6.05	6.59	6.90	7.84	7.08	5.82	7.84	7.59	9.03
PROPANE	0.85	0.87	0.95	1.03	1.31	1.57	1.32	1.71	1.71	2.03
BUTENES	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
I-BUTANE	0.06	0.07	0.06	0.06	0.05	0.07	0.07	0.08	0.11	0.00
1-BUTENE+2-METHYLPROPENE	4.73	4.86	5.35	5.69	6.41	5.81	4.77	6.58	6.14	7.51
N-BUTANE	0.92	0.95	1.05	1.11	1.43	1.52	1.28	1.66	1.61	2.03
TRANS-2-BUTENE	0.07	0.07	0.06	0.06	0.05	0.03	0.07	0.09	0.06	0.07
CIS-2-BUTENE	0.13	0.13	0.13	0.14	0.13	0.10	0.00	0.15	0.12	0.13
PENTENES	0.18	0.02	0.03	0.45	0.00	0.00	0.00	0.00	0.00	0.00
3-METHYL-1-BUTENE	0.30	0.30	0.32	0.34	0.33	0.29	0.21	0.36	0.44	0.50
1-PENTANE	0.11	0.13	0.15	0.14	0.13	0.04	0.09	0.29	0.24	0.39
1-PENTENE	3.54	3.75	4.25	4.51	4.92	4.13	3.31	5.02	4.24	5.33
2-METHYL-1-BUTENE	0.17	0.18	0.18	0.19	0.20	0.13	0.13	0.19	0.18	0.20
N-PENTANE	0.72	0.76	0.87	0.92	1.07	1.07	0.88	1.27	1.18	1.49
TRANS-2-PENTENE	0.07	0.05	0.05	0.06	0.07	0.00	0.00	0.08	0.04	0.05
CIS-2-PENTENE	0.07	0.07	0.08	0.08	0.07	0.04	0.00	0.09	0.06	0.07
UNKNOWN CS-MONOOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.02
HEXENES + ISO-HEXANES	0.42	0.44	0.43	0.47	0.51	0.35	0.26	0.78	0.74	0.98
ISO-HEXANES	0.01	0.02	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00
ISO-HEXENES	0.29	0.06	0.09	0.58	0.00	0.00	0.00	0.00	0.00	0.00
1-HEXENE	2.72	3.20	3.74	3.76	3.44	2.55	1.91	3.35	2.81	3.47
C-2-HEXENE	0.01	0.02	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00
T-2-HEXENE	0.01	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00
N-HEXANE	0.62	0.75	0.87	0.86	0.76	0.67	0.53	0.91	0.81	1.03
HEPTENES + ISO-HEPTANES	0.24	0.23	0.25	0.21	0.18	0.12	0.00	0.53	0.43	0.55
1-HEPTENE	1.99	2.65	3.31	3.11	1.78	1.05	0.72	1.79	1.42	1.85
C-2-HEPTENE	0.03	0.04	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00
T-2-HEPTENE	0.02	0.03	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00
ISO-HEPTANES	0.04	0.05	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00
ISO-HEPTENES	0.50	0.21	0.28	0.92	0.00	0.00	0.00	0.00	0.00	0.00
N-HEPTANE	0.50	0.66	0.83	0.79	0.42	0.30	0.18	0.50	0.44	0.59
C8-OLEFINS + ISO-P	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.28	0.21	0.29
1-OCTENE	1.35	2.27	2.90	2.61	0.57	0.20	0.00	0.66	0.52	0.68
C-2-OCTENE	0.06	0.08	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00
T-2-OCTENE	0.04	0.06	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00
ISO-OCTANES	0.10	0.09	0.11	0.16	0.00	0.00	0.00	0.00	0.00	0.00
ISO-OCTENES	0.75	0.39	0.48	1.29	0.00	0.00	0.00	0.00	0.00	0.00
N-OCTANE	0.76	0.71	0.90	0.81	0.16	0.00	0.00	0.23	0.19	0.23
C9-OLEFINS + ISO-P	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.06
1-NONENE	1.50	1.91	2.37	2.13	0.06	0.00	0.00	0.17	0.16	0.16
C-2-NONENE	0.08	0.09	0.11	0.10	0.00	0.00	0.00	0.00	0.00	0.00
T-2-NONENE	0.07	0.08	0.10	0.09	0.00	0.00	0.00	0.00	0.00	0.00
ISO-NONANES	0.13	0.09	0.11	0.18	0.00	0.00	0.00	0.00	0.00	0.00
ISO-NONENES	0.82	0.41	0.52	1.27	0.00	0.00	0.00	0.00	0.00	0.00
N-NONANE	0.52	0.67	0.82	0.71	0.00	0.00	0.00	0.00	0.00	0.00
N-DECANE	0.64	0.77	0.84	0.70	0.00	0.00	0.00	0.03	0.03	0.00
1-DECENE	1.33	1.60	1.91	1.62	0.00	0.00	0.00	0.03	0.06	0.00
C-2-DECENE	0.10	0.11	0.12	0.11	0.00	0.00	0.00	0.00	0.00	0.00
T-2-DECENE	0.07	0.09	0.10	0.09	0.00	0.00	0.00	0.00	0.00	0.00
ISO-DECANES	0.15	0.10	0.11	0.14	0.00	0.00	0.00	0.00	0.00	0.00
ISO-DECENES	0.72	0.32	0.40	1.00	0.00	0.00	0.00	0.00	0.00	0.00
N-UNDECANE	0.38	0.45	0.43	0.42	0.00	0.00	0.00	0.00	0.00	0.00
1-UNDECENE	0.77	0.86	0.88	0.85	0.00	0.00	0.00	0.00	0.00	0.00
C-2-UNDECENE	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00
T-2-UNDECENE	0.04	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00
ISO-UNDECANES	0.09	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
ISO-UNDECENES	0.58	0.26	0.27	0.64	0.00	0.00	0.00	0.00	0.00	0.00
N-DODECANE	0.12	0.15	0.16	0.13	0.00	0.00	0.00	0.00	0.00	0.00
1-DODECENE	0.20	0.17	0.21	0.22	0.00	0.00	0.00	0.00	0.00	0.00
C-2-DODECENE	0.02	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
T-2-DODECENE	0.01	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
ISO-DODECANES	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
ISO-DODECENES	0.20	0.01	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
N-TRIDECANE	0.03	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
1-TRIDECENE	0.04	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
C-2-TRIDECENE	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
ISO-TRIDECANES	0.03	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00
UNKNOWN LITE HYDRO-CARB LIQ (2)	0.00	0.00	0.00	0.00	28.42	25.44	30.41	21.95	24.37	19.18
UNKNOWN HUY HYDRO-CARB LIQ (3)	0.00	0.00	0.00	0.00	17.79	26.82	29.23	22.53	23.24	18.15
UNKNOWN C12+	15.90	20.38	18.26	17.39	9.00	8.00	8.00	8.00	8.00	8.00
SLURRY REACTOR-WAX	33.00	25.00	19.00	14.00	7.00	8.00	8.00	8.00	8.00	8.00

(1) Based on Inter-Reactor Sample  
(2) Collected in Chilled and Ambient Condensers  
(3) Collected in Hot Condenser



Table B-4  
 Composition of Fischer-Tropsch  
 Hydrocarbon Phase Oxygenates  
 (Run CT-256-1)

M.B. No.	1-1	1-2	1-3	1-4
Days On-stream	2.2	3.3	4.4	5.4
<u>Component, Wt %</u>				
METHANOL	0.10	0.12	0.21	0.29
ETHANOL	0.64	0.71	1.12	1.49
ACETONE	0.05	0.07	0.13	0.15
N-PROPANOL	0.60	0.61	0.91	1.16
N-BUTANONE	0.05	0.05	0.09	0.12
N-BUTANOL	0.68	0.64	0.94	1.15
N-2-BUTANOL	0.02	0.02	0.02	0.02
OTHER BUTANOLS	0.02	0.02	0.03	0.04
C5-N-METHYL KETONE	0.06	0.06	0.12	0.13
N-1-PENTANOL	0.54	0.49	0.68	0.77
N-2-PENTANOL	0.02	0.02	0.03	0.04
OTHER PENTANOLS	0.05	0.04	0.06	0.07
C6+ ALKANOLS	4.96	6.30	7.40	7.50
Total, Wt %	7.8	9.2	11.7	12.9
Yield per HC Produced, g/100g	3.4	5.3	6.8	7.8

Table B-5  
 Composition of Fischer-Tropsch  
 Aqueous Phase Organic Oxygenates  
 (Run CT-256-1)

M.B.No.	1-1	1-2	1-3	1-4
Days On-stream	2.3	3.3	4.4	5.4
Component, Wt %				
-----				
METHANOL	3.15	3.29	4.22	4.50
ETHANOL	8.45	12.34	15.64	16.31
ACETONE	0.42	0.74	1.02	1.04
N-PROPANOL	2.18	3.42	4.52	4.62
N-BUTANONE	0.09	0.20	0.30	0.31
N-BUTANOL	0.80	1.29	1.78	1.85
N-2-BUTANOL	0.02	0.04	0.05	0.05
OTHER BUTANOLS	0.03	0.06	0.09	0.09
I-PENTANONE	0.01	0.01	0.01	0.01
C5-ESTERS	0.03	0.03	0.09	0.10
C5-ESTERS + I-PENTANONE	0.03	0.10	0.17	0.19
N-1-PENTANOL	0.25	0.40	0.56	0.59
N-2-PENTANOL	0.00	0.00	0.02	0.01
OTHER PENTANOLS	0.03	0.05	0.09	0.09
C6-N-METHYL KETONE	0.02	0.02	0.08	0.09
N-1-HEXANOL	0.05	0.08	0.12	0.13
N-1-HEPTANOL	0.01	0.01	0.02	0.03
C8+ ALKANOLS	0.04	0.11	0.22	0.33
Total, Wt %	15.61	22.19	29.30	30.34
Yield per HC Produced, g/100g	1.01	1.83	1.80	1.83

Table B-6  
Composition of Fischer-Tropsch Reactor-wax  
 (Run CT-256-1)

Days On-stream	1.9	3.0	6.8	34	41	56
Carbon No.	Weight %					
13	0.04	0.04	0	0	0	0
14	0.04	0.09	0.13	0	0	0
15	0.08	0.18	0.21	0	0	0
16	0.08	0.35	0.27	0	0	0
17	0.13	0.87	0.36	0.05	0	0
18	0.24	0.66	0.59	0.11	0	0.33
19	0.52	0.88	0.72	0.24	0.08	0.61
20	0.67	1.11	1.13	0.29	0.10	0.41
21	0.70	0.96	1.15	0.41	0.10	0.95
22	0.80	1.06	1.40	0.51	0.12	1.26
23	0.99	1.29	1.55	0.61	0.31	1.52
24	1.35	1.48	1.82	0.73	0.57	1.81
25	2.68	2.04	2.28	0.90	1.82	2.95
26	4.79	3.96	4.16	1.55	1.60	3.16
27	10.86	10.02	9.87	3.41	2.50	3.79
28	6.44	6.06	5.15	4.89	4.27	5.20
29	1.78	1.81	2.14	3.35	3.07	4.37
30	1.80	1.81	2.42	5.17	4.15	4.79
31	1.34	2.29	2.90	4.44	4.58	5.09
32	3.77	3.69	4.06	6.49	5.02	5.41
33	6.15	6.05	6.62	8.67	6.52	6.02
34	9.75	10.01	10.24	11.12	8.20	7.94
35	12.35	12.85	10.67	9.31	8.97	6.00
36	4.77	4.19	4.89	4.76	4.64	3.99
37	2.14	2.56	2.24	3.35	3.46	3.05
38	2.27	1.74	2.05	2.98	2.82	2.52
39	2.58	2.49	1.89	2.64	2.82	2.42
40	2.91	3.02	2.29	3.05	2.57	2.24
41	2.76	2.05	2.25	2.84	2.63	2.22
42	2.42	2.31	1.80	2.31	2.23	1.94
43	1.76	1.55	1.31	1.79	1.76	1.70
44	0.99	0.93	0.96	1.36	1.71	1.39
45	0.81	0.71	0.87	1.15	1.56	1.35
46	0.75	0.76	0.81	1.08	1.55	1.32
47	0.68	0.70	0.78	0.98	1.54	1.35
48	0.63	0.67	0.70	0.89	1.56	1.22
49	0.65	0.61	0.63	0.80	1.46	1.16
50	0.59	0.56	0.63	0.75	1.61	1.31
51	0.53	0.48	0.57	0.70	1.45	1.22
52	0.55	0.47	0.56	0.64	1.35	1.18
53	0.49	0.43	0.52	0.53	1.36	0.90
54	0.41	0.38	0.49	0.48	1.31	0.99
55	0.36	0.40	0.42	0.45	0.86	0.76
56	0.35	0.35	0.40	0.43	1.03	0.60
57	0.39	0.35	0.39	0.39	0.80	0.58
58	0.34	0.34	0.38	0.35	0.69	0.44
59	0.30	0.31	0.32	0.30	0.63	0.35
60	0.27	0.26	0.31	0.28	0.67	0.47
61	0.28	0.26	0.32	0.26	0.60	0.42
62	0.26	0.23	0.25	0.26	0.66	0.39
63	0.24	0.23	0.24	0.26	0.56	0.63
64	0.23	0.26	0.26	0.25	0.48	0.26
65	0.21	0.12	0.21	0.20	0.37	0
66	0.21	0.22	0.16	0.17	0.31	0
67	0.19	0.15	0.16	0.16	0.21	0
68	0.19	0.15	0.12	0.15	0.18	0
69	0.02	0.17	0	0.16	0.19	0
70	0.02	0.06	0	0.17	0.16	0
71	0.08	0.03	0	0.11	0.18	0
72	0.01	0	0	0.13	0	0
73	0	0	0	0.07	0	0
74	0	0	0	0.04	0	0
Total	100	100	100	100	100	100

Table B-7  
Second-Stage Fixed-Bed ZSM-5 Reactor  
Operating Conditions and Material Balances  
(Run C1-256-1)

	1-7	1-9	1-10	1-13	1-14	1-15	1-16	1-17	1-18
(Nitrogen-Free Basis)									
M.B. No.	13.5	17.1	19.1	22.2	22.6	23.6	24.6	25.6	27.6
Days On-stream									
First-Stage Conditions:									
Charge H <sub>2</sub> /CO (Molar)	0.631	0.666	0.656	0.669	0.641	0.669	0.672	0.678	0.643
Temperature, °C	265	268	268	268	268	267	268	268	271
Pressure, MPa	1.14	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
Feed Sup. Vel., cm/s	1.746	1.668	1.668	1.712	1.786	1.767	1.768	1.763	1.789
Space Vel., NL/gFe-hr	9.786	12.009	12.096	12.415	12.952	12.813	12.821	12.784	12.973
N <sub>2</sub> in Feed, Mol %	14.9	12.5	11.5	12.8	12.8	12.7	12.4	12.7	12.7
Second-Stage Conditions:									
Temp., Inlet, °C	371	344	330	333	329	330	328	330	327
Temp., Outlet, °C	395	376	366	352	359	359	361	361	361
Pressure, MPa	1.067	1.411	1.411	1.398	1.398	1.391	1.398	1.398	1.398
QHSV, 1/hr	963	1142	1132	1212	1212	1203	1201	1201	1175
Days On-stream	0.9	4.5	6.5	9.5	10.0	11.0	12.0	13.0	15.0
Conversions, Mol %:									
H <sub>2</sub>	40.66	45.73	47.77	41.26	41.45	42.57	41.77	41.69	45.15
CO	41.21	45.27	48.05	39.58	43.75	42.77	43.03	41.57	44.33
H <sub>2</sub> +CO	41.00	45.45	47.94	40.25	42.85	42.69	42.53	41.62	44.65
Yields, Wt % of Products:									
Hydrocarbons									
C <sub>02</sub>	11.72	12.98	13.19	10.46	11.68	11.92	11.88	11.82	11.72
H <sub>2</sub> O	30.28	33.14	35.88	28.73	30.27	30.21	30.16	29.45	30.72
H <sub>2</sub>	0.63	0.97	0.96	0.71	1.01	1.02	0.99	0.96	0.66
CO	2.52	2.41	2.27	2.69	2.62	2.62	2.69	2.69	2.49
Total	54.86	50.50	47.71	57.41	54.42	54.23	54.28	55.08	54.41
Bal Recovery, Wt % of Charge:	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
gHC/Nm <sup>3</sup> (H <sub>2</sub> +CO) conv.:	102.43	103.35	103.92	100.35	98.74	100.62	100.00	101.07	97.72
(H/C) Atomic Ratio in HC:	233	231	225	204	213	220	218	223	203
Selectivities, Wt % of HC:	2.43	2.31	2.33	2.34	2.32	2.32	2.37	2.35	2.30
Methane	9.18	8.87	8.94	10.72	9.41	9.18	9.15	8.87	9.37
Ethene	0.58	0.49	0.48	0.45	0.44	0.45	0.45	0.44	0.00
Ethane	2.37	2.44	2.62	2.70	2.63	2.54	2.52	2.38	2.34
Propene	0.87	0.84	0.85	0.74	0.78	0.78	0.81	0.80	0.82
Propane	16.87	13.94	14.66	11.13	11.72	11.61	11.80	11.15	11.44
Butenes	0.73	0.79	0.79	0.84	0.89	0.87	0.89	0.90	0.94
n-Butane	16.64	15.25	15.61	14.27	14.60	14.48	14.45	13.84	14.24
1-Butane	8.36	8.66	9.22	8.33	8.76	8.80	8.53	8.33	8.77
C <sub>5</sub> - C <sub>11</sub>	35.75	39.83	38.98	42.89	43.26	43.75	43.78	45.32	44.82
C <sub>12</sub> + (Excl. Rx.-Max)	1.65	1.89	1.86	1.92	1.52	1.55	1.63	1.96	1.27
Slurry Rx.-Max	7.00	7.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1-C <sub>4</sub> /(C <sub>3</sub> +C <sub>4</sub> ) Molar	8.49	7.73	7.83	7.53	7.32	7.34	7.06	6.78	6.77
Olefins, Wt % by C-No.:									
C <sub>2</sub>	19.76	16.59	15.46	14.31	14.46	14.92	15.06	15.58	0.03
C <sub>3</sub>	4.90	5.68	5.48	6.23	6.20	6.26	6.44	6.70	6.66
C <sub>4</sub>	2.85	3.18	3.08	3.60	3.67	3.61	3.74	3.91	3.94
C <sub>5</sub> - C <sub>11</sub> PONA, Wt %:									
Paraffins	56.96	39.85	40.98	41.76	41.91	42.06	(2)	(2)	45.79
Olefins	24.58	13.77	12.38	14.97	13.51	13.33	(2)	(2)	2.57
Naphthenes	0.53	2.55	3.00	4.23	4.82	5.02	(2)	(2)	6.99
Aromatics	17.93	43.83	43.64	39.05	39.76	39.59	(2)	(2)	44.65

(1) Denotes MB adjusted for Inter-Reactor Sampling

(2) Not Available

Table B-7 (cont'd)  
 Second-Stage Fixed-Bed ZSM-5 Reactor  
 Operating Conditions and Material Balances  
 (Run C1-255-1)

	1-19	1-20	1-22	1-23	1-27	1-28	1-29	1-30	(1)
(Nitrogen-Free Basis)									
M.B. No.	28.8	30.4	33.2	34.4	36.4	37.4	40.4	41.4	42.4
Days On-stream	0.637	0.647	0.629	0.667	0.653	0.680	0.669	0.672	0.679
First-Stage Conditions:									
Charge H <sub>2</sub> /CO (Molar)	271	270	270	270	270	270	271	267	269
Temperature, °C	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
Pressure, MPa	1.789	1.726	1.752	1.802	1.771	1.754	1.755	1.748	1.761
Feed Sup. Vel., cm/s	12.97	12.52	12.71	16.23	6.76	6.69	6.69	5.24	5.32
Space Vel., NL/gFe-hr	12.0	12.6	12.3	13.1	13.3	12.3	12.1	13.0	13.0
N <sub>2</sub> in Feed, Mol %									
Second-Stage Conditions:									
Temp., Inlet, °C	328	317	317	317	302	302	301	303	303
Outlet, °C	361	353	354	352	346	346	348	348	350
Pressure, MPa	1.398	1.384	1.391	1.391	1.377	1.377	1.377	1.377	1.377
GHSV, 1/hr	1094	1111	1181	1240	1047	1030	1054	1127	1111
Days On-stream	16.2	17.8	20.5	21.8	23.8	24.8	27.7	28.7	29.7
Conversions, Mol % :									
H <sub>2</sub>	50.66	45.80	39.73	39.27	65.46	50.39	48.20	43.81	48.97
CO	47.96	46.16	45.74	35.14	47.55	53.75	51.66	48.90	49.62
H <sub>2</sub> +CO	49.01	46.02	43.42	36.79	54.63	52.39	50.27	46.85	49.35
Yields, Wt % of Products :									
Hydrocarbons									
CO <sub>2</sub>	11.32	12.90	11.69	8.60	12.61	13.03	12.20	12.53	12.36
H <sub>2</sub> O	30.14	31.01	32.63	25.37	35.27	34.38	33.37	34.99	35.40
H <sub>2</sub>	1.16	0.57	1.50	0.10	0.81	0.92	0.86	0.77	0.91
H <sub>2</sub>	2.39	2.49	2.60	2.84	1.54	2.63	2.62	2.62	2.43
CO	54.98	53.04	51.58	63.09	49.76	49.08	50.94	49.10	48.92
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Bal Recovery, Wt % of Charge:	90.44	96.94	100.57	98.04	100.59	89.76	90.49	99.21	98.14
gHC/Nm <sup>3</sup> (H <sub>2</sub> +CO) conv.:	166	215	216	179	183	173	171	207	191
(H/C) Atomic Ratio in HC :	2.33	2.24	2.34	2.43	2.28	2.29	2.33	2.29	2.32
Selectivities, Wt % of HC :									
Methane	9.41	8.34	9.52	10.45	8.56	8.63	9.27	8.91	9.38
Ethane	0.00	0.43	0.51	0.64	0.45	0.46	0.52	0.51	0.54
Ethene	2.42	1.95	2.14	2.34	1.99	1.90	1.94	1.90	1.96
Propene	0.77	0.72	0.88	1.12	0.77	0.80	0.91	0.93	0.96
Propene	12.25	10.15	11.02	11.76	9.85	9.53	9.29	8.97	9.38
Butenes	0.92	0.88	1.11	1.37	1.01	1.06	1.19	1.26	1.35
1-Butane	14.84	12.90	14.36	15.99	13.30	12.99	12.86	12.85	13.45
n-Butane	9.16	8.39	9.08	9.76	8.55	8.65	8.32	8.16	8.52
C <sub>5</sub> - C <sub>11</sub>	42.74	48.12	44.20	39.84	47.55	48.42	48.22	48.82	47.14
C <sub>12</sub> + (Excl. Rx.-Max)	1.49	2.11	1.18	0.70	1.98	1.56	1.48	1.70	1.33
Slurry Rx.-Max	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
i-C <sub>4</sub> /(C <sub>3</sub> + C <sub>4</sub> ) Molar	7.36	6.75	6.08	5.39	6.32	5.89	5.18	4.96	4.94
Olefins, Wt % by C-No. :									
C <sub>2</sub>	0.00	17.95	19.35	21.51	18.49	19.36	21.25	21.03	21.59
C <sub>3</sub>	5.89	6.63	7.40	8.89	7.26	7.76	8.89	9.39	9.30
C <sub>4</sub>	3.70	3.98	4.50	5.06	4.40	4.68	5.31	5.66	5.78
C <sub>5</sub> - C <sub>11</sub> PONA, Wt % :									
Paraffins	49.77	44.71	52.11	62.40	47.67	49.94	(2)	50.41	52.88
Olefins	1.06	1.17	2.02	2.79	3.14	2.21	(2)	2.45	3.26
Naphthenes	6.98	7.28	7.83	8.35	8.16	8.40	(2)	9.52	9.07
Aromatics	42.19	46.85	38.04	26.46	41.03	39.45	(2)	37.62	34.79

(1) Denotes MB adjusted for Inter-Reactor Sampling  
 (2) Not Available

Table B-7 (cont'd)  
 Second-Stage Fixed-Bed ZSM-5 Reactor  
 Operating Conditions and Material Balances  
 (Run CT-256-1)

(Nitrogen-Free Basis)	(1)				
M.B. No.	1- 32	1- 33	1- 34	1- 35	1- 37
Days On-stream	43.4	44.4	45.4	46.4	48.4
First-Stage Conditions:					
Charge H <sub>2</sub> /CO (Molar)	0.646	0.669	0.669	0.655	0.910
Temperature, °C	272	266	269	270	267
Pressure, MPa	1.48	1.48	1.48	1.48	1.48
Feed Sup. Vel., cm/s	1.758	1.766	1.767	1.783	1.730
Space Vel., NL/gFe-hr	5.308	5.332	5.335	5.383	5.356
N <sub>2</sub> in Feed, Mol %	13.1	12.9	13.0	12.7	12.5
Second-Stage Conditions:					
Temp., Inlet, °C	302	300	303	304	316
Outlet, °C	351	361	360	363	382
Pressure, MPa	1.370	1.377	1.377	1.377	1.384
GHSV, 1/hr	1104	958	972	982	832
Days On-stream	30.7	31.7	32.7	33.7	35.7
Conversions, Mol % :					
H <sub>2</sub>	49.15	66.50	64.46	62.47	69.27
CO	49.76	75.53	73.70	72.90	95.78
H <sub>2</sub> +CO	49.52	71.91	69.99	68.77	83.15
Yields, Wt % of Products :					
Hydrocarbons	11.90	16.05	19.40	19.99	26.46
CO <sub>2</sub>	35.54	58.45	54.53	53.09	65.70
H <sub>2</sub> O	0.94	0.73	0.02	0.00	2.05
H <sub>2</sub>	2.32	1.54	1.59	1.65	1.87
CO	49.28	23.24	24.46	25.26	3.92
Total	100.00	100.00	100.00	100.00	100.00
Bal Recovery, Wt % of Charge:	97.34	100.38	102.49	102.35	101.12
gHC/Nm <sup>3</sup> (H <sub>2</sub> +CO) conv.:	185	175	222	234	224
(H/C) Atomic Ratio in HC :	2.35	2.34	2.25	2.23	2.28
Selectivities, Wt % of HC :					
Methane	10.08	9.89	8.43	8.19	9.61
Ethene	0.58	0.45	0.38	0.43	0.50
Ethane	2.00	2.63	2.27	2.18	3.85
Propene	1.09	0.90	0.79	0.90	1.12
Propane	9.20	10.35	9.02	8.05	8.88
Butenes	1.54	1.31	1.16	1.37	1.70
i-Butane	13.29	13.88	12.06	11.16	11.08
n-Butane	8.64	9.17	8.08	7.70	7.61
C <sub>5</sub> - C <sub>11</sub>	46.29	43.40	49.37	51.40	47.47
C <sub>12</sub> + (Excl. Rx.-Wax)	1.30	2.01	2.44	2.61	2.19
Slurry Rx.-Wax	6.00	6.00	6.00	6.00	6.00
Total	100.00	100.00	100.00	100.00	100.00
i-C <sub>4</sub> /(C <sub>3</sub> = + C <sub>4</sub> =) Molar	4.29	5.35	5.26	4.19	3.35
Olefins, Wt % by C-No. :					
C <sub>2</sub>	22.37	14.65	14.44	16.40	11.40
C <sub>3</sub>	10.61	7.97	8.06	10.11	11.20
C <sub>4</sub>	6.54	5.37	5.44	6.75	8.34
C <sub>5</sub> - C <sub>11</sub> PONA, Wt % :					
Paraffins	55.19	49.87	46.27	46.36	45.89
Olefins	4.11	3.11	2.49	3.65	3.54
Naphthenes	9.42	7.49	8.35	8.13	8.36
Aromatics	31.29	39.53	42.89	41.87	42.21

(1) Denotes MB adjusted for Inter-Reactor Sampling

(2) Not Available

Table B-8  
Second-Stage ZSM-5 Reactor Raw Liquid Hydrocarbon(l) Properties  
 (Run CT-256-1)

Days On-Stream	16.1	27.1	28.8	36.4	39.1	42.4	47.9	48.4	56.4
Sp. Gr.	0.840	0.801	0.817	0.813	0.804	0.783	0.788	0.778	0.799
Acid No. (Unwashed), mgKOH/g	0.09	0.02	0.01	0.33	0.01	0.30	0.15	0.15	0.68
PONA, Wt %									
Paraffins	15.5	18.2	21.6	21.7	26.9	27.6	31.1	32.3	24.7
Olefins	1.6	0.8	0.9	3.6	1.4	2.8	2.6	4.0	6.2
Naphthenes	1.3	8.6	5.2	11.1	12.	13.5	10.1	10.9	11.1
Aromatics	81.6	72.4	72.3	63.6	59.7	56.1	56.2	52.8	58.0
Octane Numbers:									
R+0	>95	95.9	98.2	96.9	-	96.7	95.6	-	96.0
R+3	104.5	101.1	100.7	100.9	-	101.1	100.5	-	100.5
ASTM Distillation, °C									
IBP	44	44	43	42	34	46	33	33	37
50, Vol %	131	122	130	128	127	127	123	135	129
90, Vol %	179	172	178	177	179	178	172	177	186
95, Vol %	-	191	-	202	214	211	198	208	233
EP	-	-	-	234	230	234	230	249	238
Loss, Vol %	0	0	0	0	0.3	0.7	0.7	0.5	1.9
Residue, Vol %	10.0(2)	6.0(2)	7.5(2)	2.0	2.7	2.3	2.1	1.5	2.1

(1) Collected from the ambient and chilled condensers. Hydrocarbons collected in the hot condenser was very small.

(2) Distillation stopped early due to foaming at the end of distillation.

Table B-9  
Composition of Hydrocarbon Products from  
Two-Stage Slurry F-T/ZSM-5 Syngas Conversion  
(Run C1-256-1)

M.B. No. Days On-stream	1- 7 13.5	1- 9 17.1	1-10 19.1	1-13 22.2	1-14 22.6	1-15 23.8	1-16 24.6	1-17 25.6	1-18 27.6
METHANE	9.18	8.87	8.94	10.72	9.41	9.18	9.15	8.87	9.37
ETHANE	0.58	0.49	0.48	0.45	0.44	0.45	0.45	0.44	0.00
ETHANE	2.37	2.44	2.62	2.70	2.53	2.54	2.52	2.38	2.34
PROPENE	0.87	0.84	0.85	0.74	0.78	0.78	0.81	0.80	0.82
PROPANE	16.87	13.94	14.66	11.13	11.72	11.61	11.80	11.15	11.44
1-BUTANE	16.64	15.25	15.61	14.27	14.60	14.48	14.45	13.84	14.24
1-BUTENE+2-METHYLPROPENE	0.46	0.47	0.48	0.50	0.54	0.53	0.54	0.55	0.58
N-BUTANE	8.36	8.66	9.22	8.33	8.76	8.80	8.53	8.33	8.77
TRANS-2-BUTENE	0.17	0.19	0.18	0.20	0.20	0.20	0.21	0.21	0.22
CIS-2-BUTENE	0.10	0.13	0.12	0.14	0.15	0.15	0.14	0.14	0.15
3-METHYL-1-BUTENE	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-PENTANE	7.52	8.60	9.06	9.34	9.33	9.39	8.53	8.51	9.12
1-PENTENE	0.13	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
2-METHYL-1-BUTENE	0.01	0.06	0.06	0.08	0.07	0.07	0.06	0.06	0.07
N-PENTANE	1.77	2.57	2.77	3.33	3.39	3.46	3.02	3.02	3.47
TRANS-2-PENTENE	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.01
CIS-2-PENTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
2-METHYL-2-BUTENE	0.00	0.02	0.02	0.03	0.03	0.03	0.00	0.00	0.03
UNKNOWN C5-MONOLEFINS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5-DIOLEFINS (DIENES)	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,2-DIMETHYLBUTANE	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.18
CYCLOPENTANE	0.02	0.06	0.06	0.06	0.07	0.07	0.00	0.00	0.27
HEXENES + ISO-HEXANES	0.58	0.62	0.62	0.69	0.68	0.67	0.67	0.68	0.04
2,3-DIMETHYLBUTANE	0.01	0.09	0.10	0.10	0.10	0.11	0.00	0.00	0.38
2-METHYLPENTANE	0.09	0.45	0.54	0.62	0.66	0.69	0.00	0.00	2.41
3-METHYLPENTANE	0.09	0.37	0.42	0.45	0.47	0.49	0.00	0.00	1.49
HEXENES	0.72	0.02	0.03	0.02	0.03	0.02	0.00	0.00	0.03
1-HEXENE	0.95	1.33	1.35	1.84	1.76	1.79	1.76	1.78	0.00
N-HEXANE	0.86	1.07	1.13	1.44	1.36	1.40	1.08	1.06	0.85
2,4-DIMETHYLPENTANE	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01
METHYLCYCLOPENTANE	0.04	0.20	0.24	0.33	0.37	0.39	0.00	0.00	0.90
3,3-DIMETHYLPENTANE	0.00	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.01
CYCLOHEXANE	0.00	0.01	0.01	0.02	0.02	0.02	0.00	0.00	0.02
HEPTENES + ISO-HEPTANES	0.38	0.62	0.58	1.15	1.01	1.03	1.03	1.09	0.04
1-HEPTENE	1.36	0.87	0.79	0.67	0.63	0.61	0.62	0.58	0.00
2-METHYLHEXANE	0.03	0.16	0.21	0.28	0.31	0.33	0.00	0.00	0.61
2,3-DIMETHYLPENTANE	0.02	0.12	0.13	0.16	0.18	0.18	0.00	0.00	0.21
3-METHYLHEXANE	0.06	0.26	0.32	0.42	0.45	0.48	0.00	0.00	0.74
1-CIS-3-DIMETHYL-N5	0.01	0.04	0.06	0.10	0.12	0.13	0.00	0.00	0.21
1-TRANS-3-DIMETHYL-N5	0.01	0.07	0.02	0.14	0.16	0.17	0.00	0.00	0.25
1-TRANS-2-DIMETHYL-N5	0.01	0.07	0.09	0.12	0.14	0.15	0.00	0.00	0.22
N-HEPTANE	0.19	0.21	0.22	0.37	0.39	0.35	0.29	0.25	0.27
C7-OLEFINS	0.85	0.02	0.13	0.04	0.04	0.03	0.00	0.00	0.03
METHYLCYCLOHEXANE	0.03	0.16	0.19	0.29	0.34	0.36	0.00	0.00	0.37
C8-OLEFINS + ISO-P	0.24	0.25	0.24	0.82	0.72	0.70	0.71	0.76	0.05
1-OCTENE	1.75	1.52	1.13	1.31	1.15	1.12	1.13	1.14	0.00
MONOMETHYL-ISO-C8-P	0.05	0.13	0.18	0.29	0.33	0.35	0.00	0.00	0.35
OTHER ISO-C8-P	0.01	0.05	0.06	0.09	0.11	0.11	0.00	0.00	0.10
C8-OLEFINS	1.02	0.02	0.06	0.03	0.03	0.03	0.00	0.00	0.05
C8-NAPHTHENES (N5+N6)	0.06	0.34	0.41	0.62	0.72	0.76	0.00	0.00	0.73
N-OCTANE	0.26	0.00	0.01	0.06	0.06	0.06	0.10	0.05	0.01
C9-OLEFINS + ISO-P	0.49	0.74	0.40	0.37	0.32	0.32	0.37	0.38	0.80
1-NONENE	0.00	0.00	0.00	0.06	0.05	0.05	0.11	0.11	0.00
MONOMETHYL-ISO-C9-P	0.03	0.02	0.03	0.06	0.07	0.08	0.00	0.00	0.08
OTHER ISO-C9-P	0.01	0.04	0.04	0.07	0.08	0.09	0.00	0.00	0.08
C9-OLEFINS	0.84	0.00	0.03	0.01	0.00	0.01	0.00	0.00	0.02
C9-NAPHTHENES (N5+N6)	0.01	0.07	0.08	0.13	0.16	0.17	0.00	0.00	0.17
N-NONANE	0.20	0.01	0.02	0.02	0.02	0.02	0.00	0.00	0.02
ISO-C10-P + D + N5 + N6	8.57	1.08	0.10	0.11	0.12	0.13	0.00	0.00	0.09
BENZENE	0.36	0.82	0.78	0.60	0.60	0.61	0.00	0.00	1.13
TOLUENE	2.37	5.68	5.47	4.79	5.08	4.99	0.00	0.00	5.81
ETHYLBENZENE	0.04	0.59	0.61	0.72	0.76	0.77	0.00	0.00	0.86
P-XYLENE	0.19	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
M-XYLENE	1.15	4.14	3.98	3.43	4.11	4.13	0.00	0.00	4.47
O-XYLENE	0.49	1.25	1.19	1.17	1.19	1.20	0.00	0.00	1.33
N-PROPYLBENZENE	0.02	0.04	0.05	0.05	0.05	0.05	0.00	0.00	0.06
1-METHYL-3-ETHYL-BENZENE	0.31	1.10	1.13	1.39	1.46	1.47	0.00	0.00	1.68
1,3,5-TRIMETHYL-BENZENE	0.19	0.21	0.17	0.11	0.09	0.09	0.00	0.00	0.09
1-METHYL-2-ETHYLBENZENE	0.10	0.24	0.24	0.28	0.28	0.29	0.00	0.00	0.33
ISO-C4-BENZENE	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
1,2,4-TRIMETHYLBENZENE	0.51	1.27	1.27	1.46	1.50	1.54	0.00	0.00	1.76
1-METHYL-2-ISO-C3-BENZENE	0.00	0.00	0.15	0.13	0.11	0.11	0.00	0.00	0.12
1,3-DIETHYLBENZENE	0.01	0.03	0.03	0.03	0.03	0.04	0.00	0.00	0.04
1-METHYL-3-N-C3-BENZENE	0.00	0.10	0.11	0.15	0.16	0.16	0.00	0.00	0.19
N-C4-BENZENE	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02
1,2,3-TRIMETHYLBENZENE	0.00	0.00	0.11	0.09	0.09	0.07	0.00	0.00	0.07
1,2-DIETHYLBENZENE	0.03	0.02	0.02	0.03	0.04	0.04	0.00	0.00	0.05
C10-ALKYLBENZENES	0.21	0.44	0.43	0.50	0.50	0.51	0.00	0.00	0.59
1,2,4,5-TETRAMETHYLBENZENE	0.00	0.07	0.06	0.08	0.08	0.10	0.00	0.00	0.10
1,2,3,5-TETRAMETHYLBENZENE	0.00	0.01	0.06	0.06	0.06	0.07	0.00	0.00	0.06
C11-ALKYLBENZENES	0.33	1.28	0.98	1.05	1.01	1.03	0.00	0.00	1.16
NAPHTHALENE	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.01
METHYL-NAPHTHALENES	0.00	0.14	0.13	0.05	0.00	0.04	0.00	0.00	0.09
UNKNOWN (HC AROMATICS)	0.01	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
UNKNOWN LITE HYDRO-CARB L10 (1)	0.00	0.00	0.00	0.00	0.00	0.00	24.29	25.85	0.00
UNKNOWN C12+	1.65	1.89	1.86	1.92	1.52	1.55	1.63	1.96	1.27
SLURRY REACTOR-WAX	7.00	7.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00

(1) Collected in Chilled and Ambient Condensers.



Table B-9 (cont'd)  
Composition of Hydrocarbon Products from  
Two-Stage Slurry F-T/ISM-S Syn gas Conversion  
(Run C1-256-1)

M.B. No.	1-19	1-20	1-22	1-23	1-27	1-28	1-29	1-30	1-31
Days On-stream	28.8	30.4	33.2	34.4	36.4	37.4	40.4	41.4	42.4
METHANE	9.41	8.34	9.52	10.45	8.56	8.63	9.27	8.91	9.38
ETHENE	0.00	0.43	0.51	0.64	0.45	0.46	0.52	0.51	0.54
ETHANE	2.42	1.95	2.14	2.34	1.99	1.90	1.94	1.90	1.96
PROPENE	0.77	0.72	0.88	1.12	0.77	0.80	0.91	0.93	0.96
PROPANE	12.25	10.15	11.02	11.76	9.85	9.53	9.29	8.97	9.38
I-BUTANE	14.84	12.90	14.36	15.99	13.30	12.99	12.86	12.85	13.45
1-BUTENE+2-METHYLPROPENE	0.55	0.55	0.67	0.84	0.63	0.66	0.73	0.75	0.82
N-BUTANE	9.16	8.39	9.08	9.76	8.55	8.65	8.32	8.16	8.52
TRANS-2-BUTENE	0.23	0.20	0.27	0.32	0.23	0.24	0.27	0.30	0.32
CIS-2-BUTENE	0.15	0.13	0.17	0.21	0.15	0.16	0.18	0.21	0.21
3-METHYL-1-BUTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-PENTANE	9.61	8.88	9.60	10.83	9.22	9.20	8.45	9.10	9.42
1-PENTENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
2-METHYL-1-BUTENE	0.07	0.06	0.10	0.09	0.08	0.09	0.09	0.10	0.13
N-PENTANE	3.61	3.69	4.09	4.42	3.54	4.27	3.76	4.25	4.46
TRANS-2-PENTENE	0.01	0.01	0.01	0.01	0.05	0.01	0.00	0.07	0.07
CIS-2-PENTENE	0.03	0.03	0.06	0.05	0.00	0.06	0.06	0.03	0.03
2-METHYL-2-BUTENE	0.03	0.04	0.04	0.03	0.62	0.05	0.00	0.06	0.06
UNKNOWN C5-MONOOLEFINS	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.25	0.28
C5-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00
2,2-DIMETHYLBUTANE	0.15	0.17	0.22	0.27	0.00	0.20	0.25	0.01	0.01
CYCLOPENTANE	0.27	0.26	0.26	0.29	0.21	0.22	0.17	0.22	0.22
HEXENES + ISO-HEXANES	0.04	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00
2,3-DIMETHYLBUTANE	0.39	0.37	0.37	0.43	0.35	0.33	0.25	0.34	0.33
2-METHYLPENTANE	2.49	2.63	2.88	3.04	3.00	3.11	2.17	3.12	3.23
3-METHYLPENTANE	1.52	1.59	1.60	1.69	1.57	1.58	1.05	1.61	1.62
HEXENES	0.02	0.03	0.03	0.04	0.11	0.05	0.00	0.07	0.10
N-HEXANE	0.86	0.98	1.18	1.25	1.22	1.36	0.84	1.47	1.51
2,4-DIMETHYLPENTANE	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01
METHYLCYCLOPENTANE	0.90	0.96	1.03	1.11	0.98	1.01	0.58	1.06	1.09
3,3-DIMETHYLPENTANE	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01
CYCLOHEXANE	0.02	0.02	0.00	0.01	0.00	0.02	0.00	0.03	0.02
HEPTENES + ISO-HEPTANES	0.04	0.15	0.21	0.24	0.17	0.19	0.20	0.19	0.19
2-METHYLHEXANE	0.60	0.72	0.76	0.77	0.84	0.94	0.37	0.96	0.93
2,3-DIMETHYLPENTANE	0.20	0.24	0.21	0.19	0.24	0.24	0.04	0.26	0.24
3-METHYLHEXANE	0.73	0.84	0.84	0.79	0.94	1.02	0.37	1.04	1.04
1-CIS-3-DIMETHYL-N5	0.20	0.24	0.29	0.31	0.32	0.34	0.12	0.38	0.36
1-TRANS-3-DIMETHYL-N5	0.24	0.21	0.19	0.14	0.24	0.25	0.00	0.28	0.26
1-TRANS-2-DIMETHYL-N5	0.22	0.28	0.27	0.29	0.29	0.29	0.12	0.32	0.31
N-HEPTANE	0.26	0.29	0.36	0.44	0.34	0.42	0.20	0.50	0.49
C7-OLEFINS	0.03	0.04	0.06	0.04	0.09	0.08	0.00	0.08	0.17
METHYLCYCLOHEXANE	0.35	0.45	0.41	0.35	0.38	0.33	0.04	0.58	0.52
C8-OLEFINS + ISO-P	0.05	0.09	0.14	0.28	0.00	0.17	0.14	0.13	0.13
MONOMETHYL-ISO-C8-P	0.31	0.44	0.43	0.31	0.60	0.65	0.00	0.77	0.67
OTHER ISO-C8-P	0.09	0.13	0.11	0.09	0.15	0.10	0.00	0.19	0.16
C8-OLEFINS	0.04	0.05	0.07	0.06	0.14	0.23	0.00	0.12	0.22
C8-NAPHTHENES (N5+N6)	0.66	0.89	0.81	0.64	1.13	1.28	0.00	1.40	1.19
N-OCTANE	0.01	0.01	0.02	0.03	0.03	0.04	0.00	0.06	0.03
C9-OLEFINS + ISO-P	0.05	0.00	0.11	0.23	0.00	0.10	0.10	0.05	0.05
MONOMETHYL-ISO-C9-P	0.07	0.11	0.08	0.09	0.18	0.20	0.00	0.26	0.22
OTHER ISO-C9-P	0.07	0.11	0.07	0.07	0.14	0.15	0.00	0.20	0.15
C9-OLEFINS	0.02	0.01	0.07	0.02	0.02	0.03	0.00	0.04	0.09
C9-NAPHTHENES (N5+N6)	0.14	0.20	0.20	0.16	0.32	0.32	0.00	0.38	0.31
N-NONANE	0.02	0.03	0.02	0.02	0.03	0.03	0.00	0.04	0.03
ISO-C10-P + O + N5 + N6	0.15	0.22	0.20	0.14	0.26	0.29	0.00	0.42	0.36
N-DECANE	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-DECENE	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BENZENE	1.13	1.16	0.91	0.82	0.86	0.78	0.35	0.75	0.79
TOLUENE	5.43	6.24	4.47	3.12	4.39	4.59	0.71	4.00	3.78
ETHYLBENZENE	1.20	1.43	1.26	1.22	1.12	1.44	0.39	1.33	1.25
P-XYLENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M-XYLENE	3.87	4.98	2.63	1.79	4.56	4.05	0.00	3.90	3.42
O-XYLENE	1.13	1.48	1.06	0.53	1.36	1.19	0.00	1.16	1.01
N-PROPYLBENZENE	0.05	0.06	0.05	0.03	0.08	0.07	0.00	0.08	0.07
1-METHYL-3-ETHYL-BENZENE	1.40	1.93	1.62	0.89	2.23	2.24	0.00	2.39	2.04
1,3,5-TRIMETHYL-BENZENE	0.08	0.10	0.05	0.02	0.07	0.05	0.00	0.04	0.04
1-METHYL-2-ETHYLBENZENE	0.24	0.32	0.23	0.11	0.29	0.27	0.00	0.23	0.20
ISO-C4-BENZENE	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.01
1,2,4-TRIMETHYLBENZENE	1.46	1.95	1.44	0.77	1.90	1.74	0.00	1.75	1.47
1-METHYL-2-ISO-C3-BENZENE	0.10	0.13	0.07	0.03	0.09	0.07	0.00	0.05	0.04
1,3-DIETHYLBENZENE	0.04	0.05	0.04	0.02	0.08	0.07	0.00	0.05	0.05
1-METHYL-3-N-C3-BENZENE	0.16	0.22	0.20	0.13	0.26	0.30	0.00	0.36	0.30
N-C4-BENZENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
1,2,3-TRIMETHYLBENZENE	0.08	0.11	0.05	0.04	0.09	0.09	0.00	0.07	0.06
1,2-DIETHYLBENZENE	0.04	0.05	0.05	0.04	0.08	0.09	0.00	0.11	0.09
1-METHYL-2-N-C3-BENZENE	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
C10-ALKYLBENZENES	0.50	0.68	0.54	0.32	0.74	0.76	0.00	0.81	0.66
1,2,4,5-TETRAMETHYLBENZENE	0.09	0.12	0.09	0.03	0.07	0.12	0.00	0.12	0.10
1,2,3,5-TETRAMETHYLBENZENE	0.05	0.07	0.05	0.00	0.01	0.07	0.00	0.06	0.05
1,2,3,4-TETRAMETHYLBENZENE	0.01	0.00	0.00	0.02	0.21	0.01	0.00	0.15	0.10
C11-ALKYLBENZENES	0.97	1.26	0.89	0.60	1.05	1.07	0.00	0.89	0.83
NAPHTHALENE	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METHYL-NAPHTHALENES	0.00	0.09	0.00	0.00	0.00	0.02	0.00	0.05	0.04
UNKNOWN (HC AROMATICS)	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00
UNKNOWN LITE HYDRO-CARB LIQ (1)	0.00	0.00	0.00	0.00	0.00	0.00	27.38	0.00	0.00
UNKNOWN C12+	1.49	2.11	1.18	0.70	1.98	1.58	1.48	1.70	1.33
SLURRY REACTOR-MAX	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00

(1) Collected in Chilled and Ambient Condensers.

Table B-9 (cont'd)  
 Composition of Hydrocarbon Products from  
 Two-Stage Slurry F-T/ZSM-5 Syn gas Conversion  
 (Run C1-255-1)

M.B. No.	1-32	1-33	1-34	1-35	1-37
Days On-stream	43.4	44.4	45.4	46.4	48.4
METHANE	10.08	9.89	8.43	8.19	9.61
ETHENE	0.58	0.45	0.38	0.43	0.50
ETHANE	2.00	2.63	2.27	2.18	3.85
PROPENE	1.09	0.90	0.79	0.90	1.12
PROPANE	9.20	10.35	9.02	8.05	8.88
BUTENES	0.00	0.00	0.00	0.00	0.00
1-BUTANE	13.29	13.88	12.06	11.16	11.09
1-BUTENE+2-METHYLPROPENE	0.94	0.80	0.70	0.83	1.02
N-BUTANE	8.64	9.17	8.08	7.70	7.61
TRANS-2-BUTENE	0.36	0.31	0.28	0.32	0.41
CIS-2-BUTENE	0.24	0.20	0.18	0.21	0.27
3-METHYL-1-BUTENE	0.00	0.00	0.00	0.02	0.03
I-PENTANE	9.34	8.58	8.15	7.98	7.47
1-PENTENE	0.00	0.02	0.02	0.02	0.03
2-METHYL-1-BUTENE	0.14	0.13	0.12	0.14	0.18
N-PENTANE	4.55	4.19	4.16	4.20	3.88
TRANS-2-PENTENE	0.11	0.09	0.08	0.10	0.13
CIS-2-PENTENE	0.04	0.04	0.04	0.04	0.06
2-METHYL-2-BUTENE	0.09	0.08	0.10	0.13	0.19
UNKNOWN C5-MONOOLEFINS	0.31	0.27	0.23	0.27	0.00
C5-DIOLEFINS (DIENES)	0.00	0.00	0.00	0.00	0.00
2,2-DIMETHYLBUTANE	0.00	0.00	0.01	0.01	0.01
CYCLOPENTANE	0.20	0.12	0.19	0.10	0.20
HEXENES + ISO-HEXANES	0.00	0.01	0.00	0.03	0.31
2,3-DIMETHYLBUTANE	0.31	0.18	0.23	0.23	0.21
2-METHYLPENTANE	3.24	2.52	2.98	3.05	2.60
3-METHYLPENTANE	1.58	1.11	1.40	1.43	1.26
HEXENES	0.11	0.13	0.12	0.23	0.22
N-HEXANE	1.62	1.25	1.48	1.62	1.46
2,4-DIMETHYLPENTANE	0.01	0.01	0.01	0.01	0.01
METHYLCYCLOPENTANE	1.08	0.71	0.95	1.00	0.94
3,3-DIMETHYLPENTANE	0.01	0.00	0.01	0.01	0.01
CYCLOHEXANE	0.03	0.02	0.03	0.00	0.03
HEPTENES + ISO-HEPTANES	0.24	0.12	0.10	0.12	0.06
2-METHYLHEXANE	0.98	0.72	0.93	1.04	0.86
2,3-DIMETHYLPENTANE	0.24	0.16	0.23	0.27	0.24
3-METHYLHEXANE	1.07	0.74	1.01	1.10	0.92
1-CIS-3-DIMETHYL-N5	0.38	0.25	0.34	0.37	0.33
1-TRANS-3-DIMETHYL-N5	0.27	0.20	0.29	0.33	0.32
1-TRANS-2-DIMETHYL-N5	0.31	0.21	0.28	0.29	0.26
N-HEPTANE	0.56	0.37	0.43	0.51	0.49
C7-OLEFINS	0.18	0.13	0.17	0.35	0.26
METHYLCYCLOHEXANE	0.50	0.27	0.29	0.39	0.32
C8-OLEFINS + ISO-P	0.14	0.05	0.02	0.05	0.00
MONOMETHYL-ISO-C8-P	0.73	0.70	0.83	0.94	0.80
OTHER ISO-C8-P	0.17	0.13	0.17	0.28	0.17
C8-OLEFINS	0.25	0.22	0.16	0.27	0.38
C8-NAPHTHENES (N5+N6)	1.25	1.08	1.36	1.36	1.25
N-OCTANE	0.11	0.10	0.08	0.03	0.13
C9-OLEFINS + ISO-P	0.15	0.03	0.00	0.00	0.00
MONOMETHYL-ISO-C9-P	0.27	0.29	0.30	0.35	0.30
OTHER ISO-C9-P	0.20	0.15	0.17	0.20	0.15
C9-OLEFINS	0.13	0.05	0.07	0.15	0.14
C9-NAPHTHENES (N5+N6)	0.36	0.39	0.40	0.34	0.33
N-NONANE	0.03	0.02	0.02	0.03	0.01
ISO-C10-P + O + N5 + N6	0.41	0.42	0.26	0.51	0.48
BENZENE	0.67	0.53	0.74	0.77	0.74
TOLUENE	3.35	3.10	4.18	4.38	4.03
ETHYLBENZENE	1.18	1.14	1.39	1.41	1.20
P-XYLENE	0.00	0.00	1.25	0.00	0.00
M-XYLENE	2.89	3.64	3.35	4.61	4.39
O-XYLENE	0.84	1.10	1.38	1.35	1.31
N-PROPYLBENZENE	0.09	0.11	0.12	0.13	0.14
1-METHYL-3-ETHYL-BENZENE	2.00	2.67	3.06	3.17	3.02
1,3,5-TRIMETHYL-BENZENE	0.03	0.04	0.05	0.04	0.05
1-METHYL-2-ETHYL-BENZENE	0.13	0.20	0.33	0.24	0.20
ISO-C4-BENZENE	0.01	0.01	0.01	0.01	0.02
1,2,4-TRIMETHYLBENZENE	1.25	1.67	1.94	1.97	1.92
1-METHYL-2-ISO-C3-BENZENE	0.02	0.04	0.05	0.04	0.03
1,3-DIETHYLBENZENE	0.05	0.07	0.11	0.08	0.12
1-METHYL-3-N-C3-BENZENE	0.24	0.45	0.47	0.52	0.48
N-C4-BENZENE	0.01	0.00	0.00	0.02	0.00
1,2,3-TRIMETHYLBENZENE	0.04	0.09	0.11	0.09	0.10
1,2-DIETHYLBENZENE	0.09	0.13	0.15	0.15	0.15
1-METHYL-2-N-C3-BENZENE	0.00	0.00	0.00	0.00	0.00
C10-ALKYLBENZENES	0.64	0.85	0.94	0.97	0.87
1,2,4,5-TETRAMETHYLBENZENE	0.08	0.10	0.11	0.12	0.10
1,2,3,5-TETRAMETHYLBENZENE	0.03	0.06	0.06	0.06	0.04
1,2,3,4-TETRAMETHYLBENZENE	0.07	0.09	0.18	0.19	0.15
C11-ALKYLBENZENES	0.66	1.02	1.10	1.16	0.87
NAPHTHALENE	0.00	0.01	0.00	0.00	0.00
METHYL-NAPHTHALENES	0.02	0.04	0.00	0.05	0.00
UNKNOWN (HC PARAFFINICS)	0.12	0.00	0.00	0.00	0.00
UNKNOWN (HC AROMATICS)	0.00	0.00	0.14	0.00	0.11
UNKNOWN C12+	1.30	2.01	2.44	2.61	2.19
SLURRY REACTOR-WAX	6.00	6.00	6.00	6.00	6.00