FIGURE 76

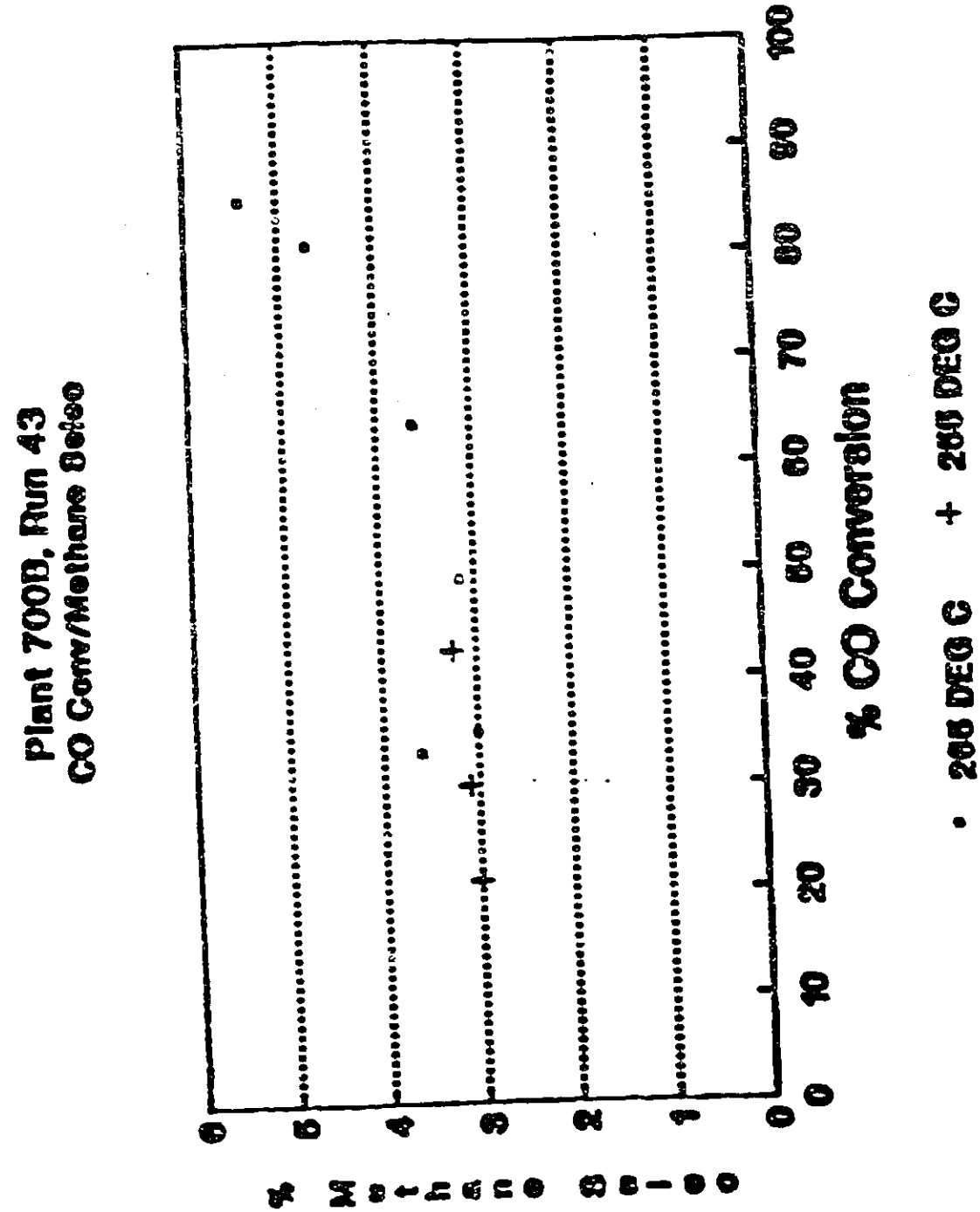

Plant 700B, Run 43
CO Conv/Methane Selec
% CO Conversion
• 205 DEG C + 205 DEG C
0 10 20 30 40 50 60 70 80 90 100
0 1 2 3 4 5 6

FIGURE 77

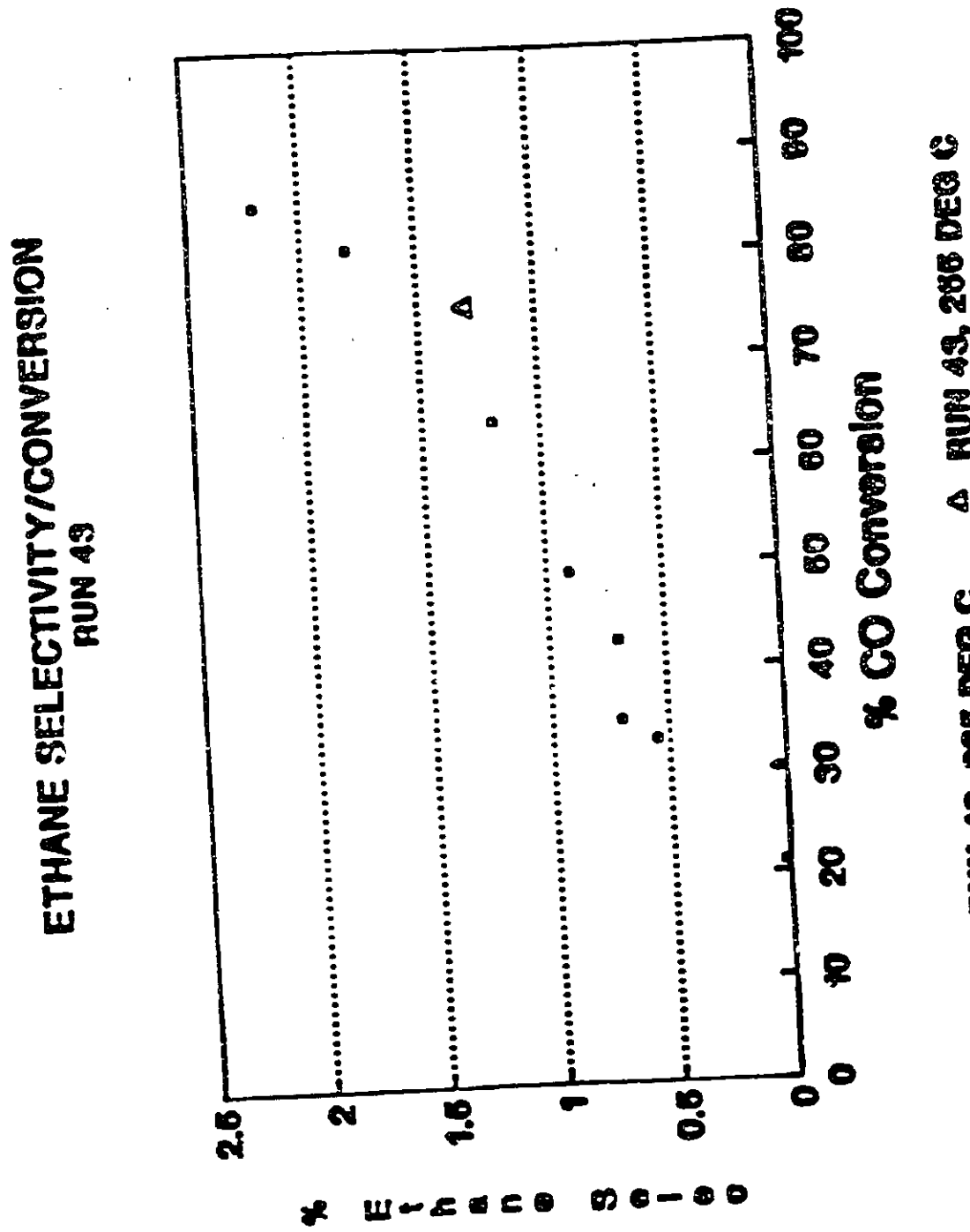

ETHANE SELECTIVITY/CONVERSION
RUN 43
% Ethane Selectivity
2.5
2
1.5
1
0.5
0
10
20
30
40
50
60
70
80
90
100
% CO Conversion
• RUN 43, 265 DEG C
Δ RUN 43, 285 DEG C

FIGURE 78

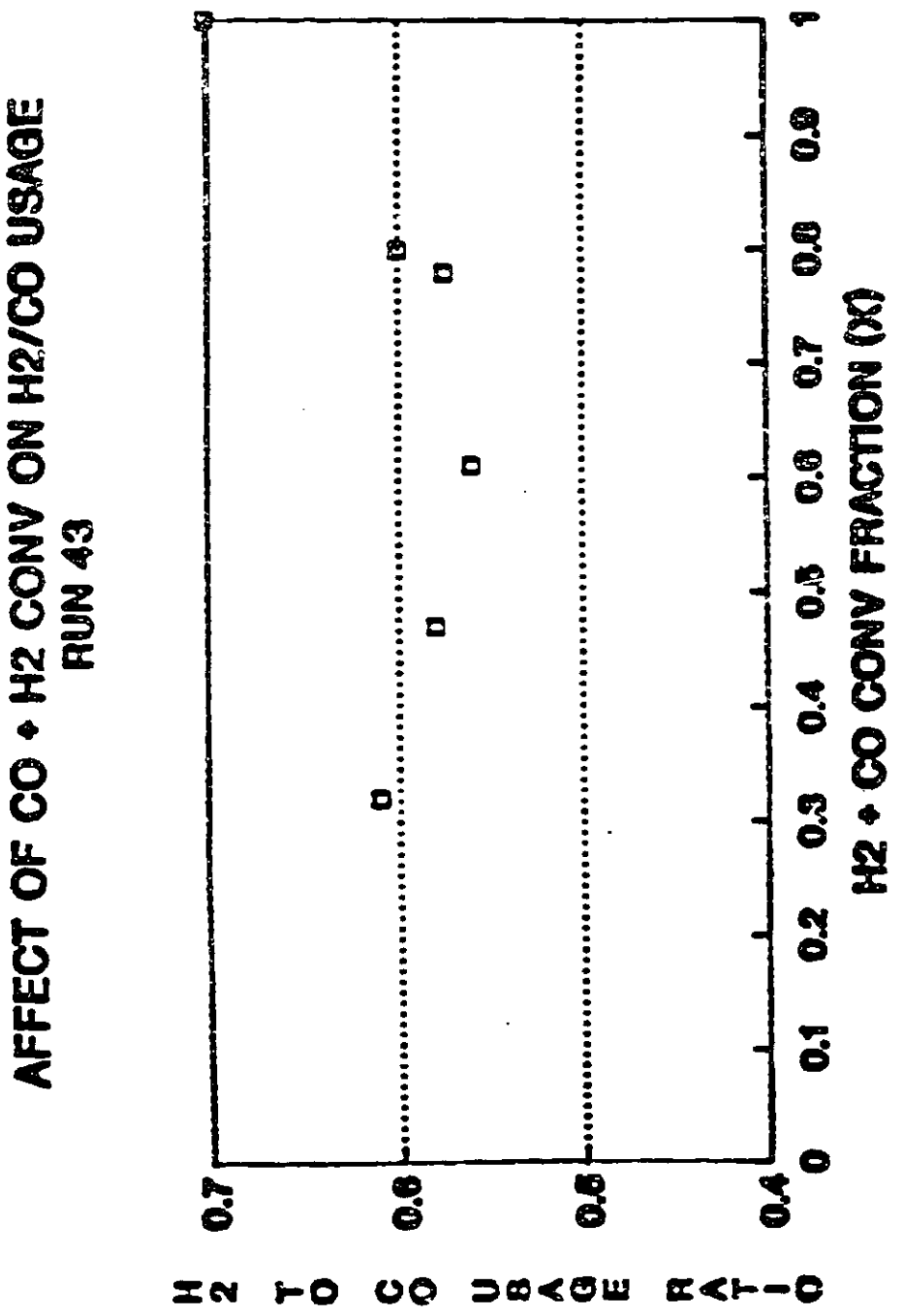

AFFECT OF CO + H2 CONV ON H2/CO USAGE
RUN 43
H2 TO CO USAGE RATIO
0.7
0.6
0.5
0.4
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
H2 + CO CONV FRACTION (X)
205 DEG C
RUN 43

FIGURE 79

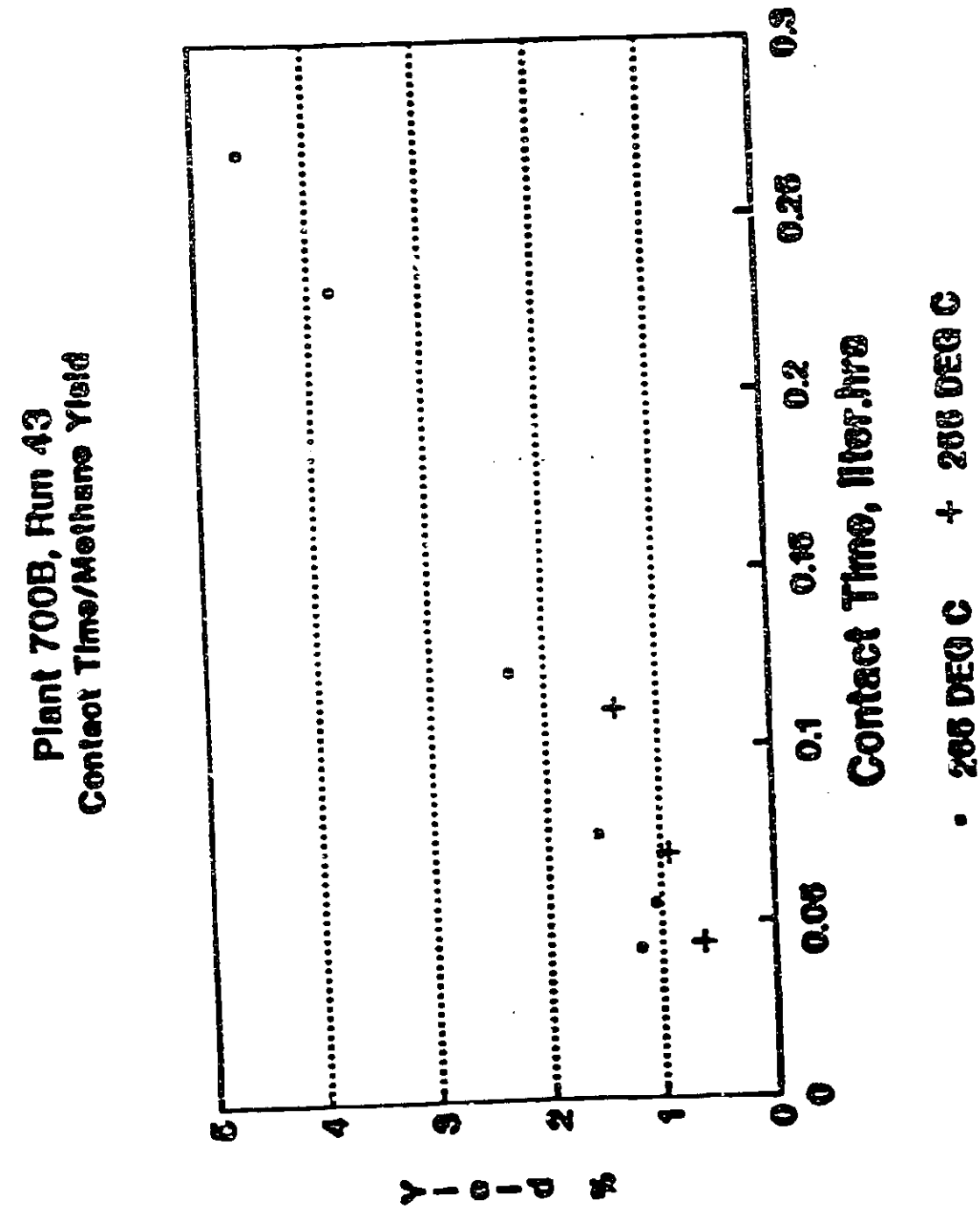

Plant 700B, Run 43
Contact Time/Methane Yield
Y-e-d %
6
4
3
2
1
0
0
0.05
0.1
0.15
0.2
0.25
0.3
Contact Time, liter.hrs
• 205 DEG C + 200 DEG C

FIGURE 80

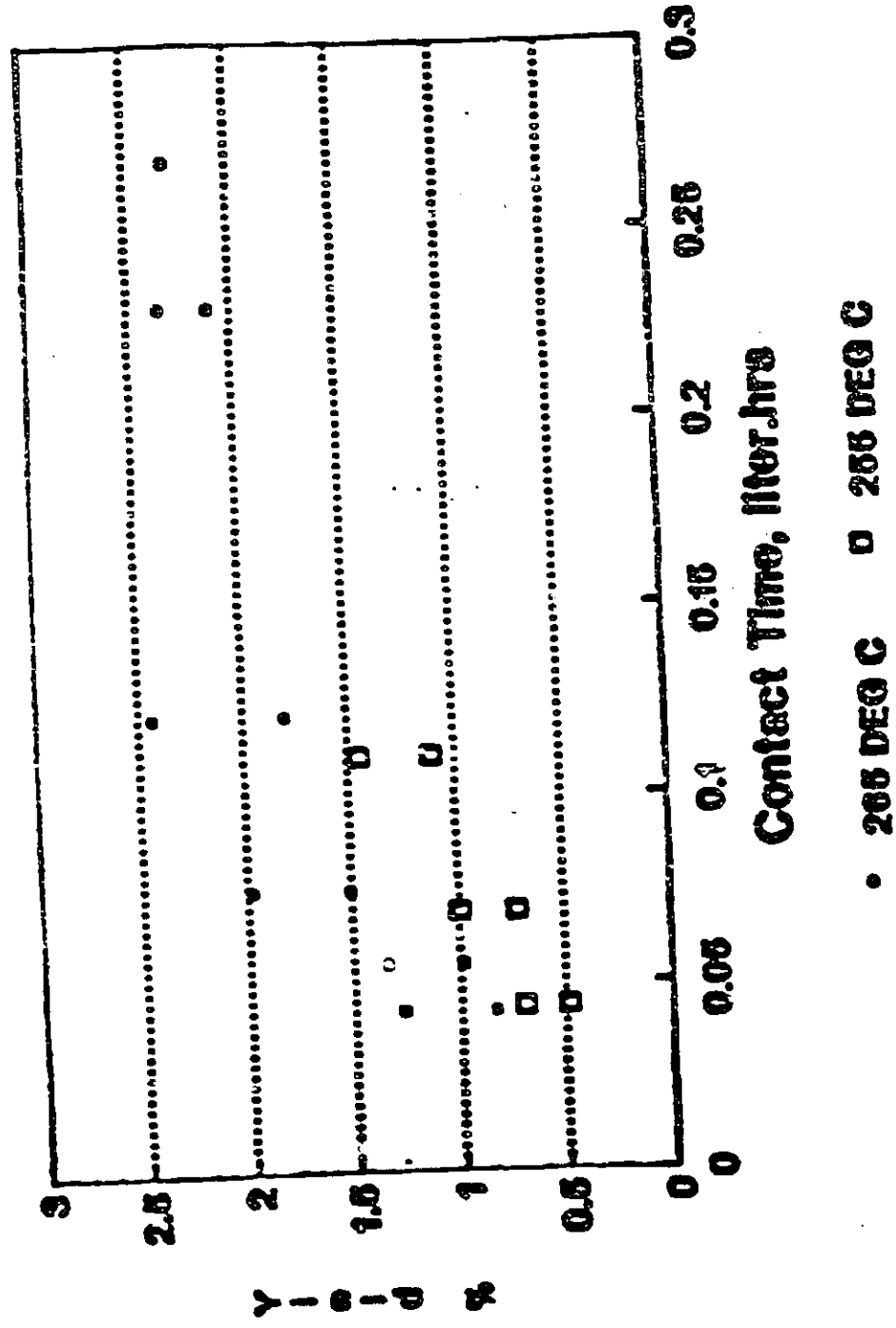


FIGURE 80
Plant 700B, Run 43
Contact Time/Ethylene Yield
Y - e - d %
3
2.5
2
1.5
1
0.5
0
0
0.05
0.1
0.15
0.2
0.25
0.3
Contact Time, liter.hrs
• 265 DEG C
□ 255 DEG C

FIGURE 81

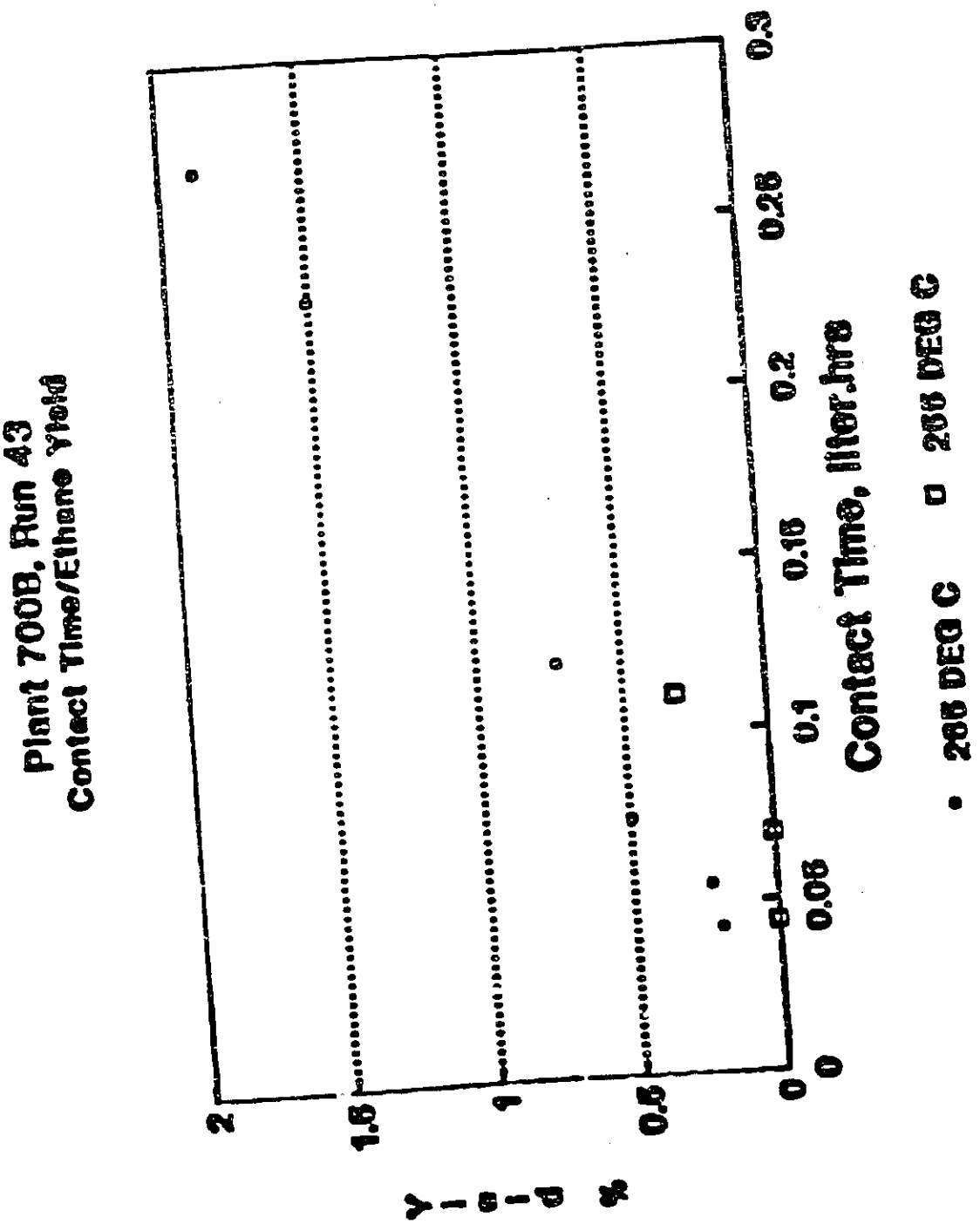

Plant 700B, Run 43
Contact Time/Ethene Yield
Y - e - d %
2
1.5
1
0.5
0
0
0.06
0.1
0.16
0.2
0.26
0.3
Contact Time, liter.hrs
• 265 DEG C
□ 235 DEG C

FIGURE 82

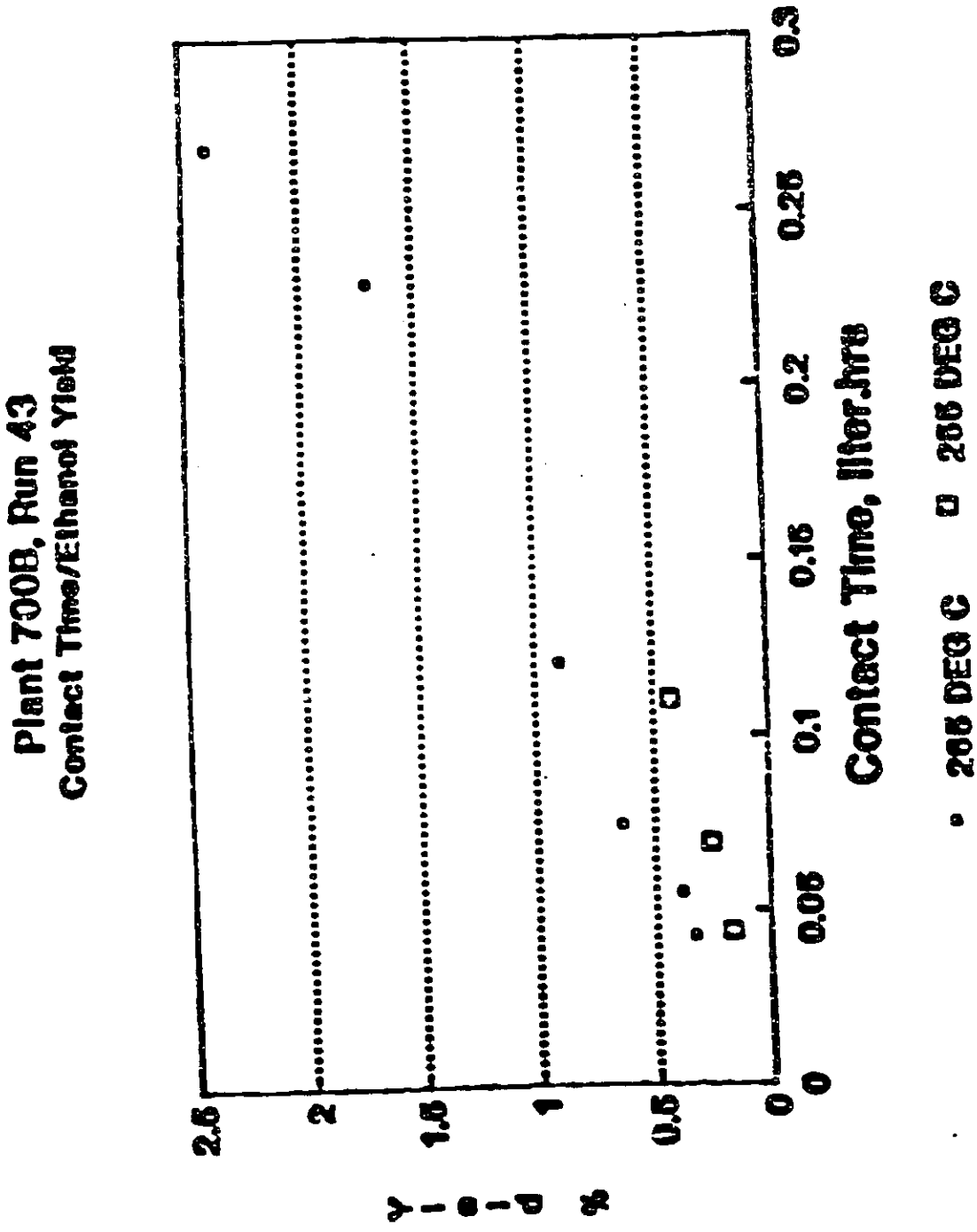

Plant 700B, Run 43
Contact Time/Ethanol Yield
Contact Time, liter.hrs
y - e - d %
2.5
2
1.5
1
0.5
0
0.05
0.1
0.15
0.2
0.25
0.3
• 265 DEG C
□ 285 DEG C

FIGURE 23

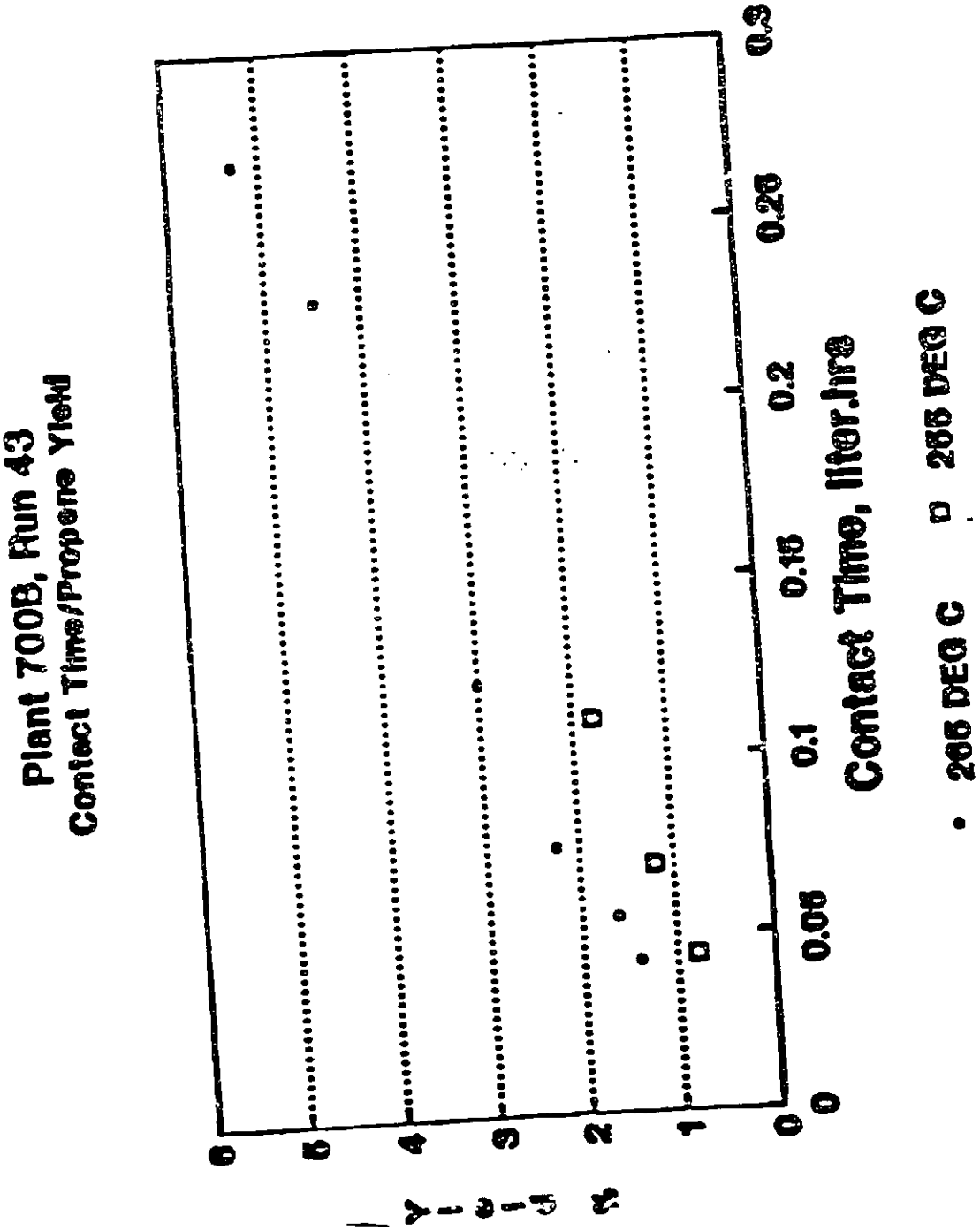

Plant 700B, Run 43
Contact Time/Propane Yield
Contact Time, liter.hrs
0
0.05
0.1
0.15
0.2
0.25
0.3
0
1
2
3
4
5
6
• 205 DEG C
□ 205 DEG C

FIGURE 84

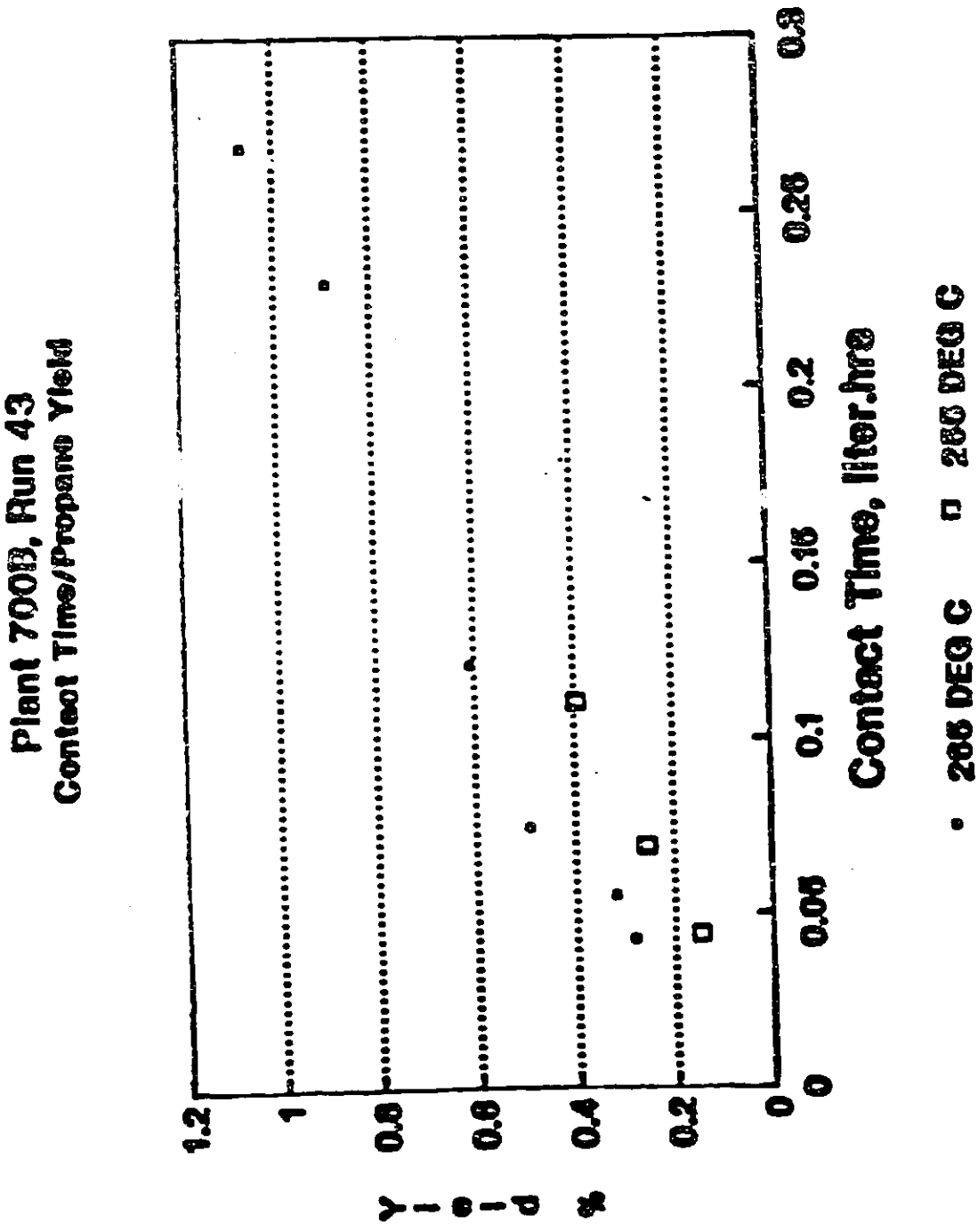

Plant 700B, Run 43
Contact Time/Propane Yield
Y i e l d %
1.2
1
0.8
0.6
0.4
0.2
0
0
0.05
0.1
0.15
0.2
0.25
0.3
Contact Time, liter.hrs
• 205 DEG C
□ 205 DEG C

FIGURE 85

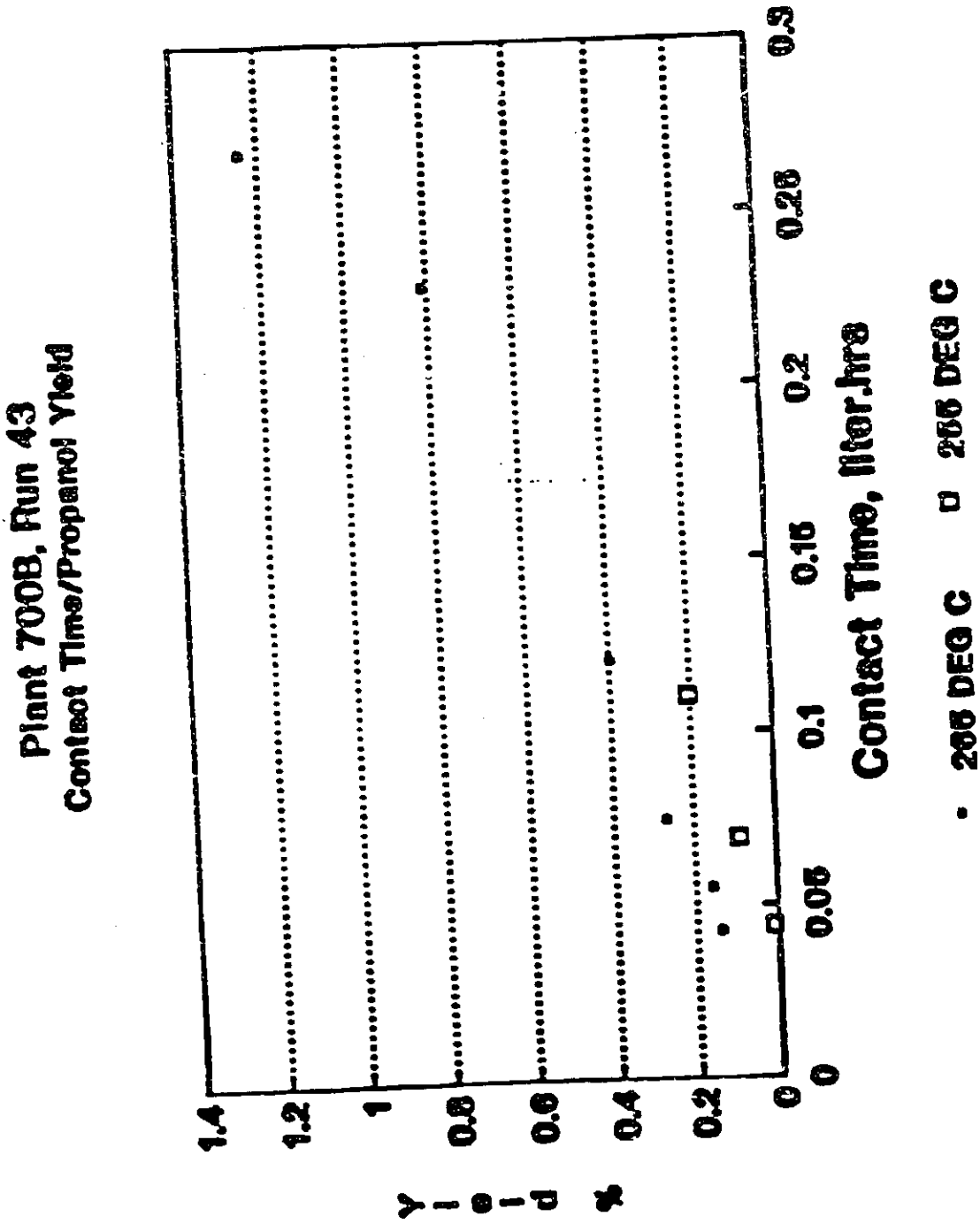

Plant 700B, Run 43
Contact Time/Propanol Yield
Y - e - d %
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.05
0.1
0.15
0.2
0.25
0.3
Contact Time, liter.hrs
• 205 DEG C
□ 255 DEG C

FIGURE 86

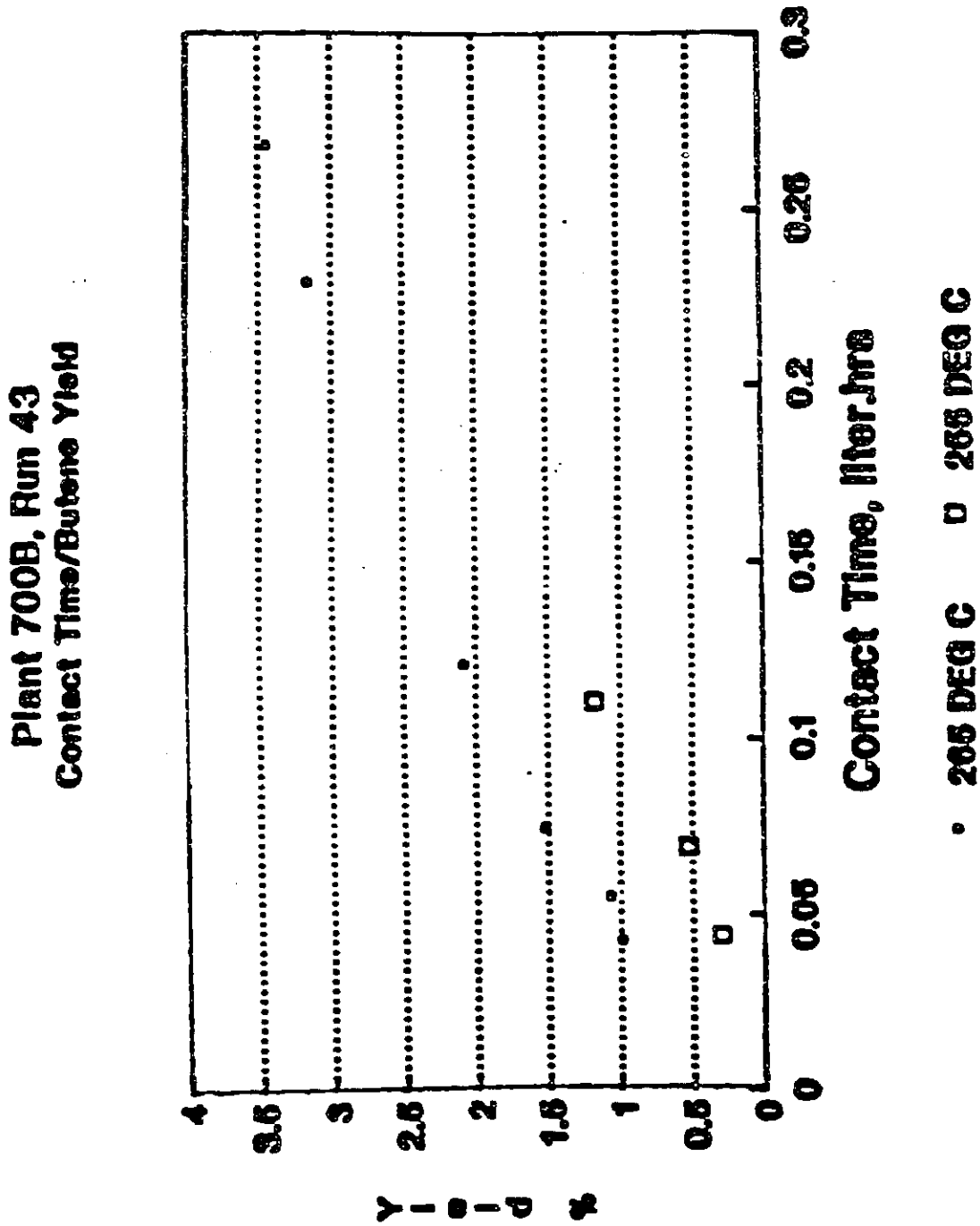

Plant 700B, Run 43
Contact Time/Butene Yield
Y — e — d %
4
3.5
3
2.5
2
1.5
1
0.5
0
0
0.05
0.1
0.15
0.2
0.25
0.3
Contact Time, liter.hrs
• 265 DEG C
□ 265 DEG C

FIGURE 87

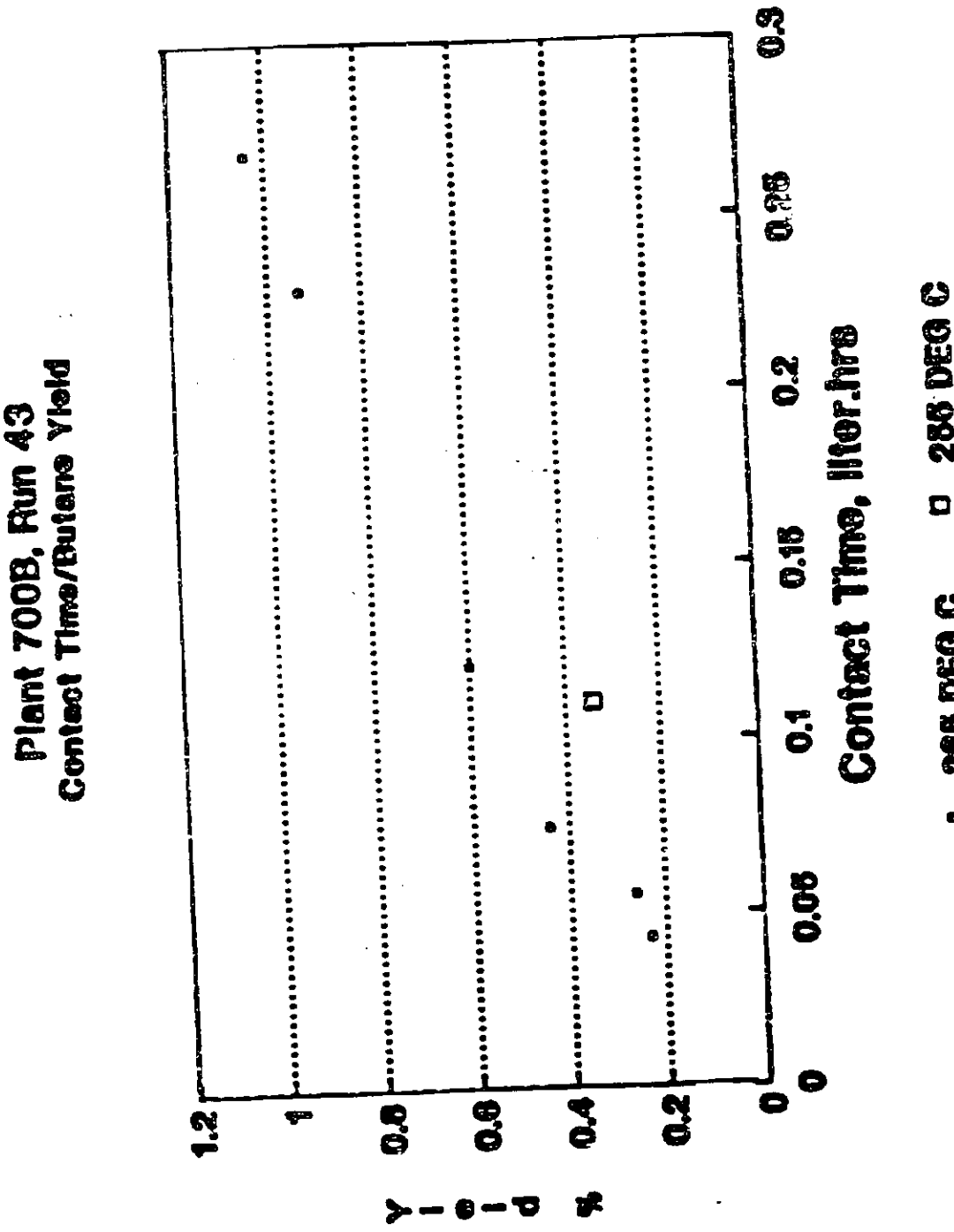

Plant 700B, Run 43
Contact Time/Butane Yield
Y - e - d %
1.2
1
0.8
0.6
0.4
0.2
0
0.05
0.1
0.15
0.2
0.25
0.3
Contact Time, liter.hrs
• 266 DEG C
□ 286 DEG C

FIGURE 88

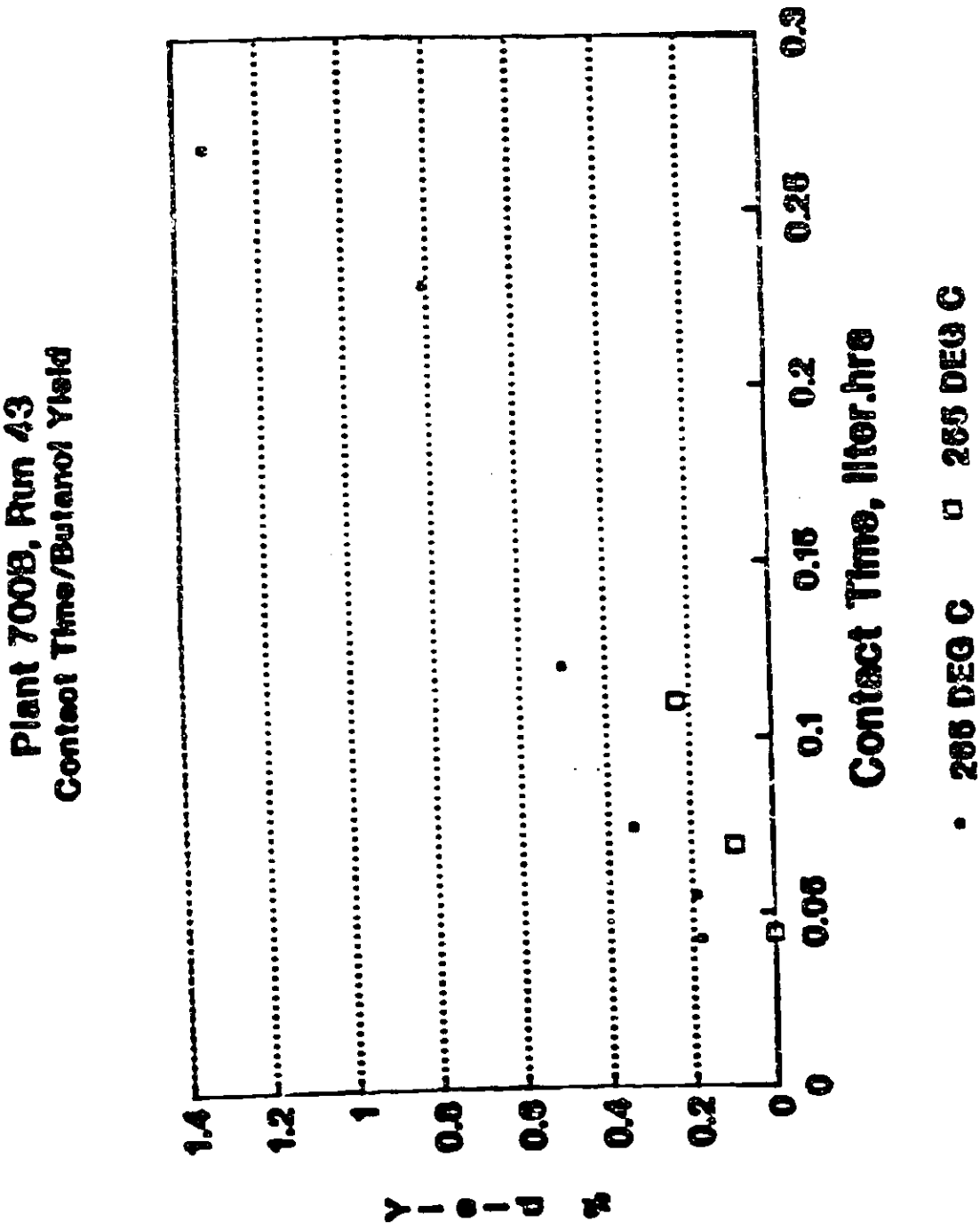

Plant 7008, Run 43
Contact Time/Butanol Yield
Y — g — d %
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.05
0.1
0.15
0.2
0.25
0.3
Contact Time, liter.hrs
• 265 DEG C
□ 285 DEG C

FIGURE 89

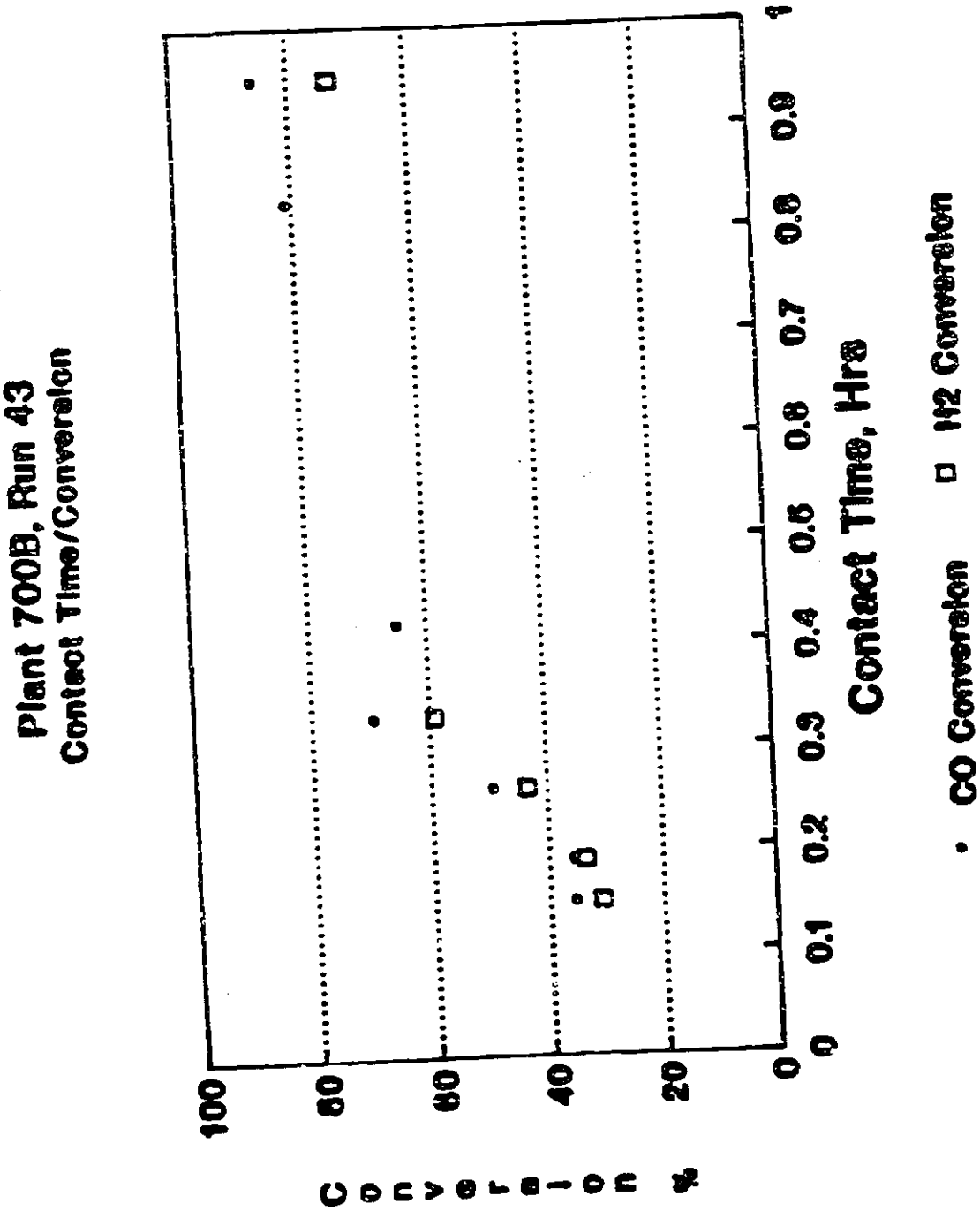

Plant 700B, Run 43
Contact Time/Conversion
Conversion %
100
80
60
40
20
0
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1
Contact Time, Hrs
• CO Conversion
□ H2 Conversion

FIGURE 90

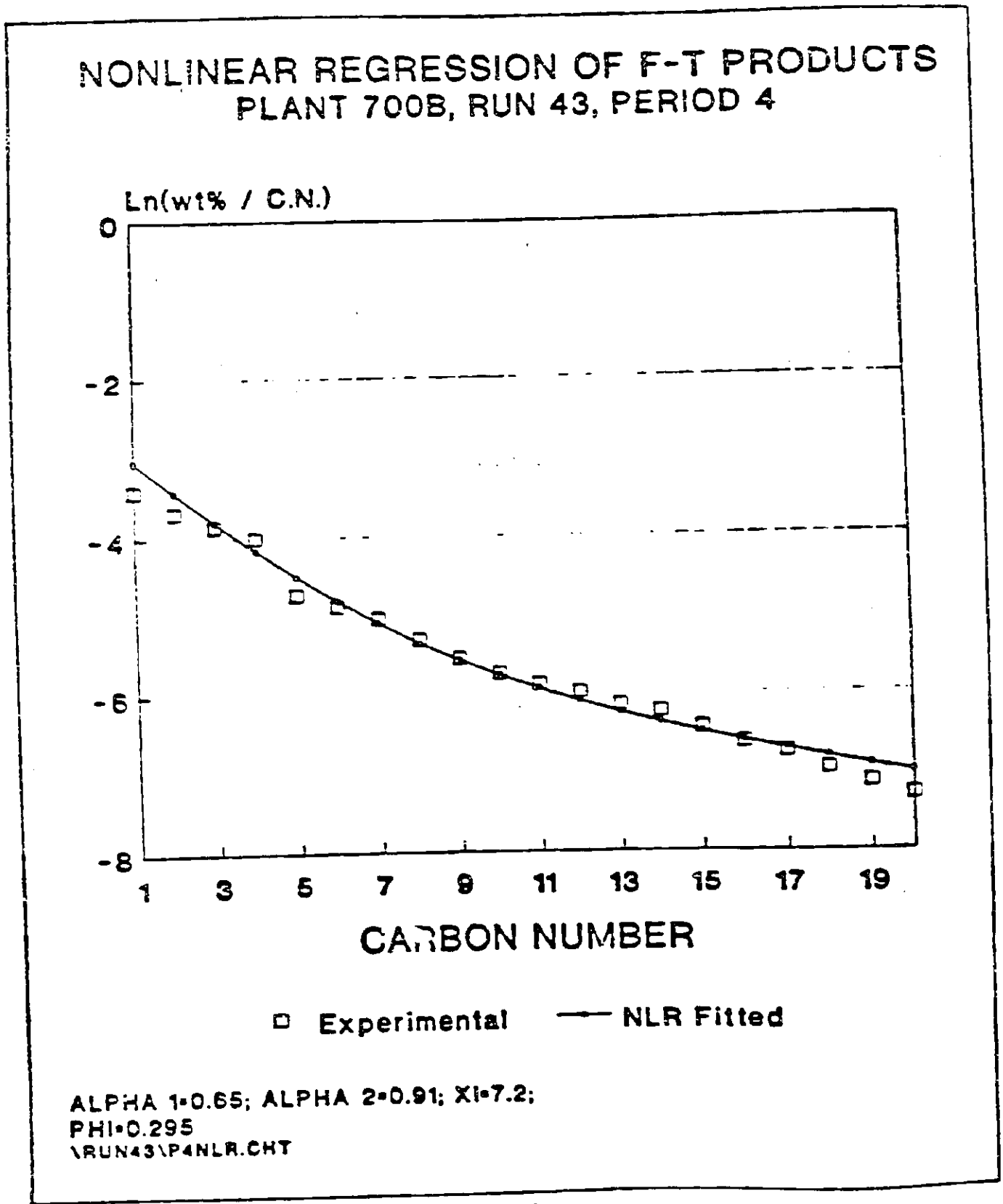

NONLINEAR REGRESSION OF F-T PRODUCTS
PLANT 700B, RUN 43, PERIOD 4
Ln(wt% / C.N.)
0
-2
-4
-6
-8
1
3
5
7
9
11
13
15
17
19
CARBON NUMBER
Experimental
NLR Fitted
ALPHA 1=0.65; ALPHA 2=0.91; XI=7.2;
PHI=0.295
\RUN43\P4NLR.CHT

FIGURE 91

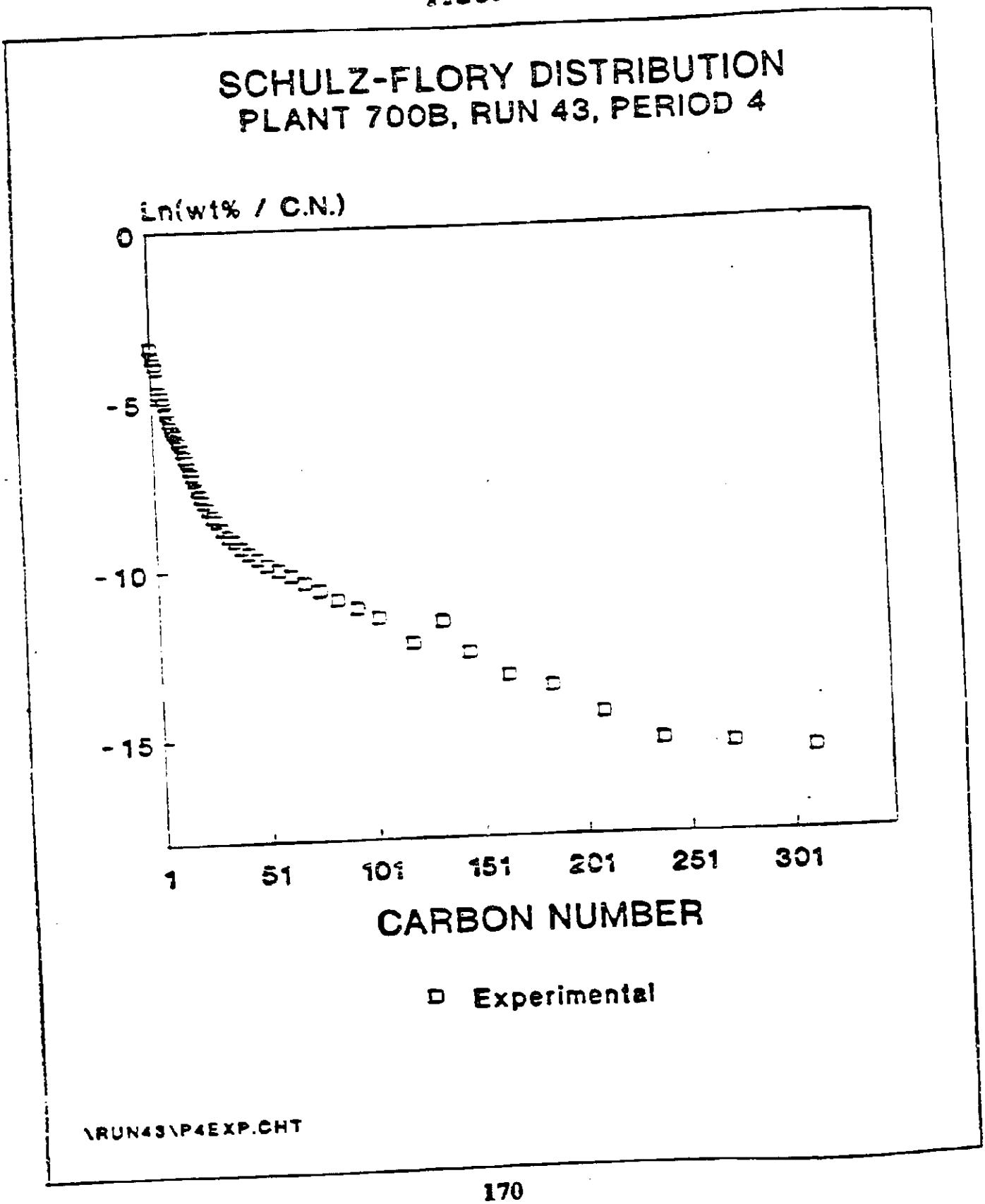

SCHULZ-FLORY DISTRIBUTION
PLANT 700B, RUN 43, PERIOD 4
Ln(wt% / C.N.)
0
-5
-10
-15
1
51
101
151
201
251
301
CARBON NUMBER
Experimental
\RUN43\P4EXP.CHT

FIGURE 92

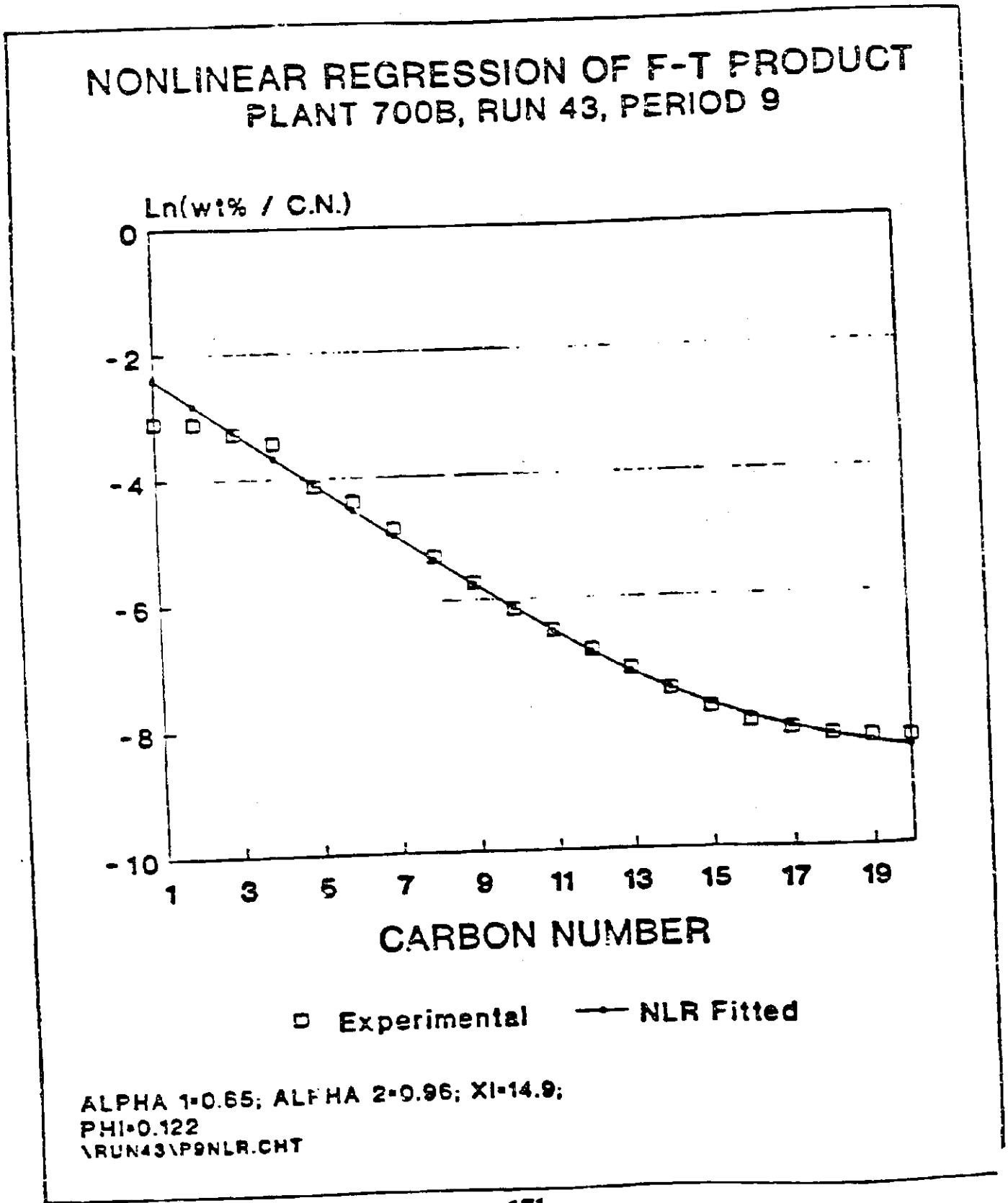

NONLINEAR REGRESSION OF F-T PRODUCT
PLANT 700B, RUN 43, PERIOD 9
Ln(wt% / C.N.)
0
-2
-4
-6
-8
-10
1
3
5
7
9
11
13
15
17
19
CARBON NUMBER
Experimental
NLR Fitted
ALPHA 1=0.65; ALPHA 2=0.96; XI=14.9;
PHI=0.122
\RUN43\P9NLR.CHT

FIGURE 93

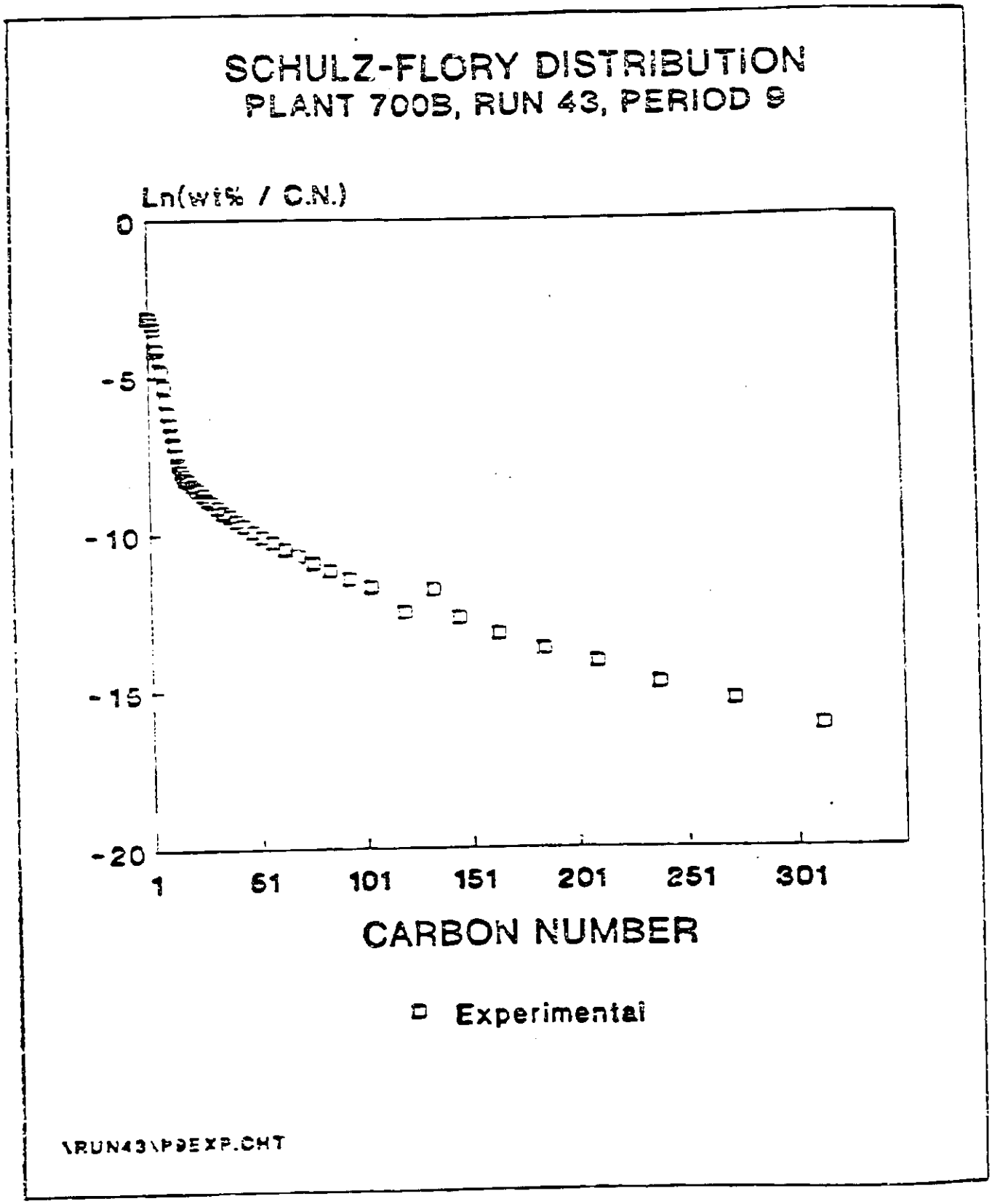

SCHULZ-FLORY DISTRIBUTION
PLANT 700B, RUN 43, PERIOD 9
Ln(wt% / C.N.)
0
-5
-10
-15
-20
1
51
101
151
201
251
301
CARBON NUMBER
Experimental
\RUN43\PDEXP.CHT

FIGURE 94

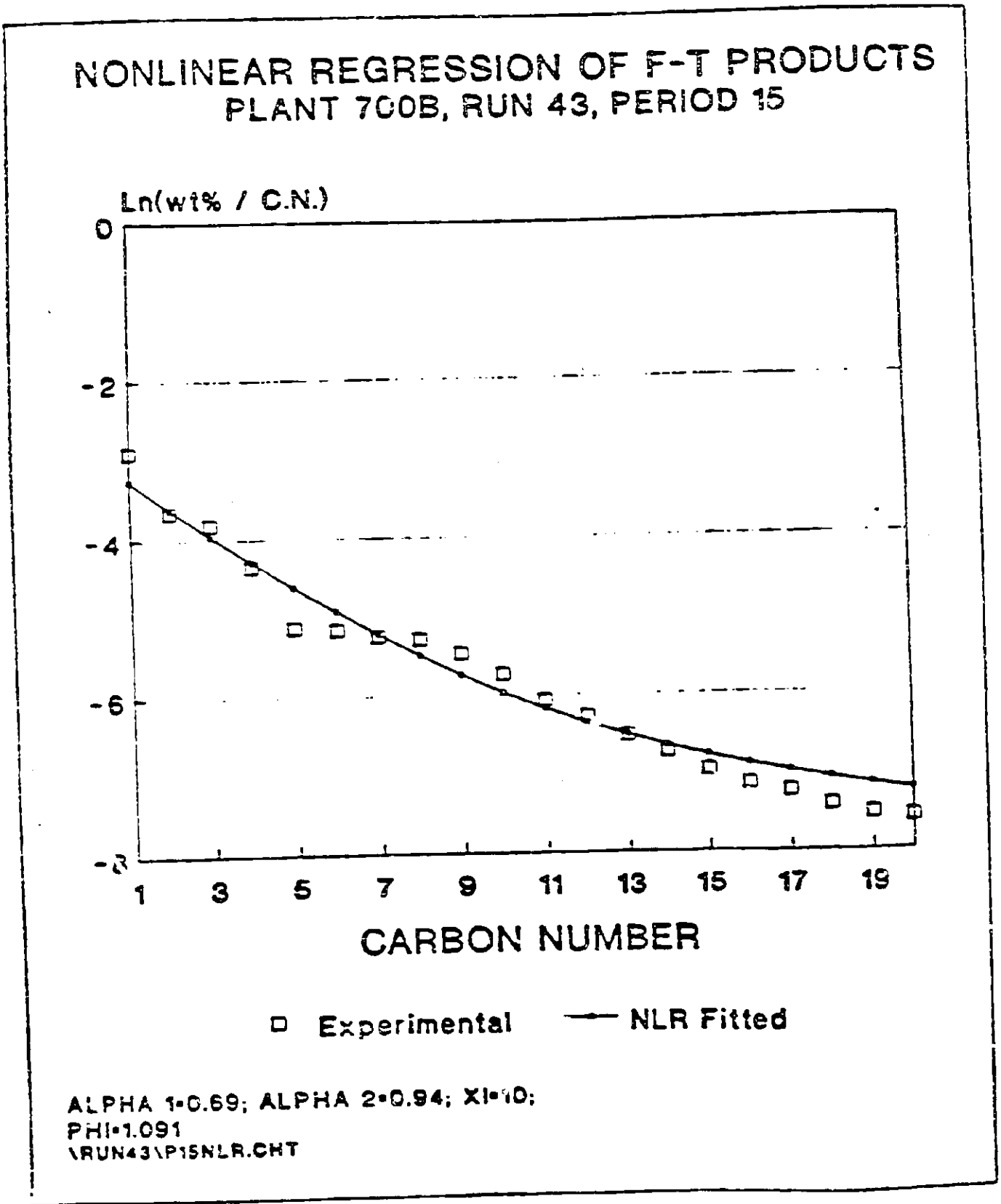
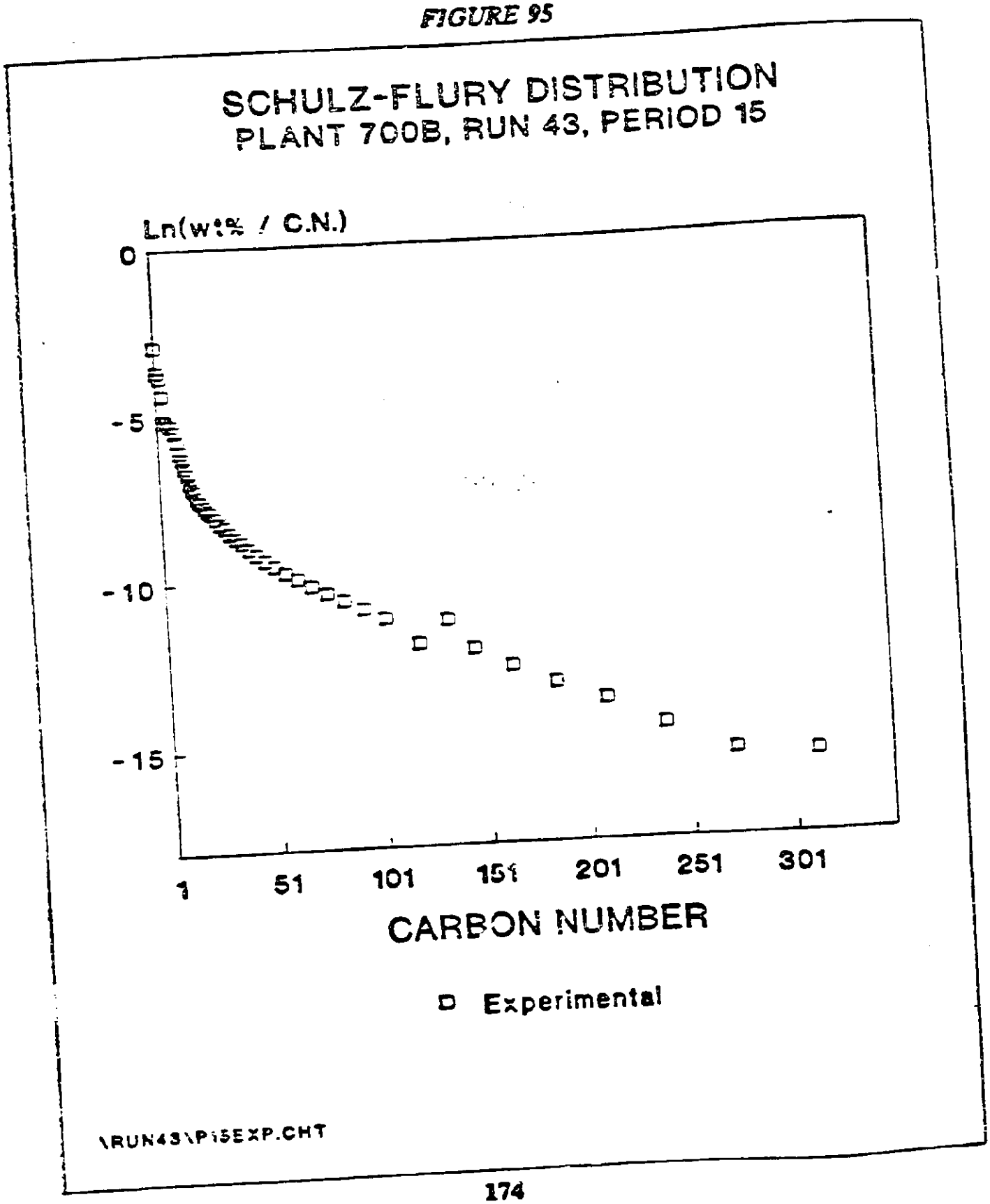
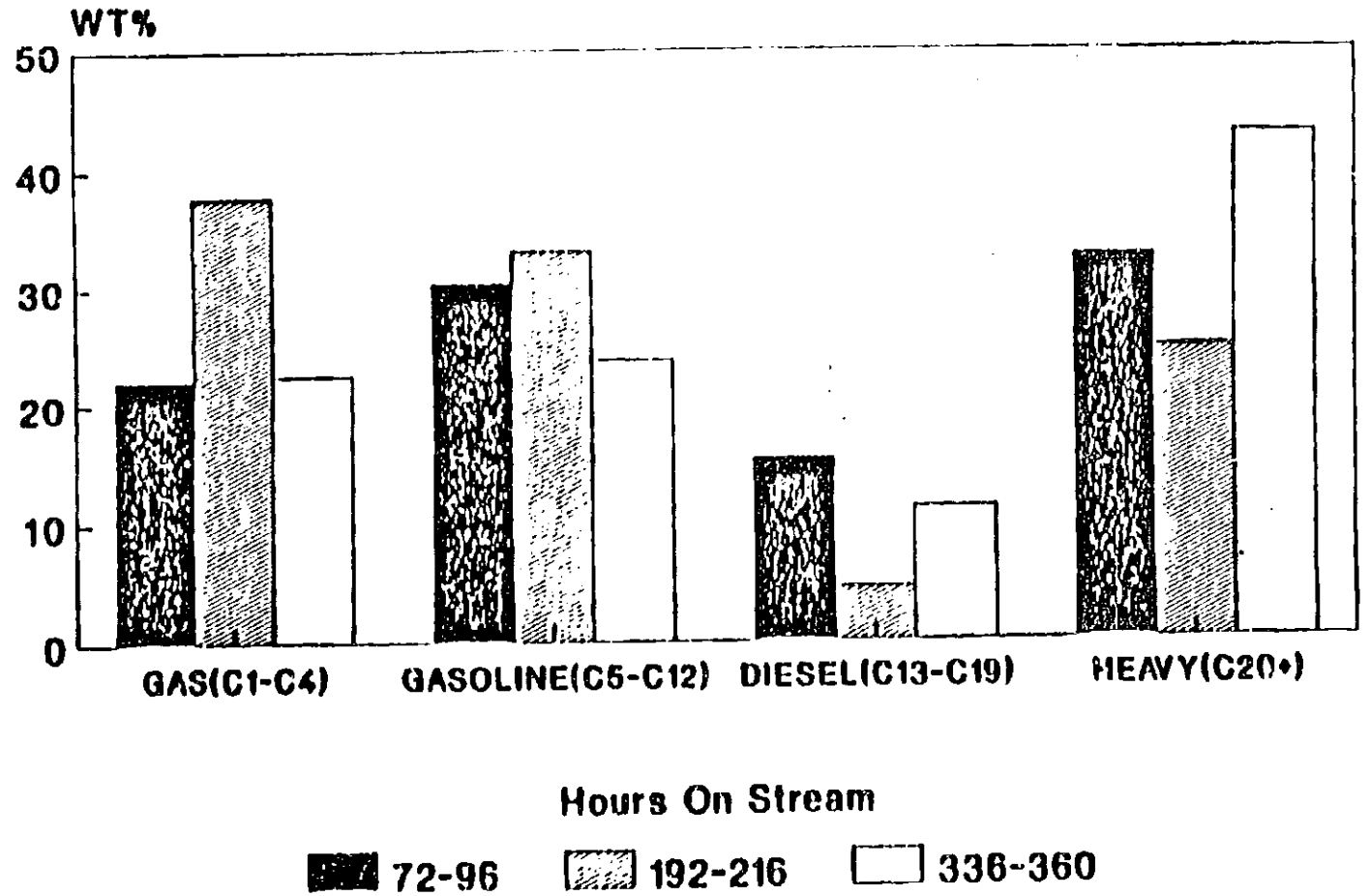

NONLINEAR REGRESSION OF F-T PRODUCTS
PLANT 700B, RUN 43, PERIOD 15
Ln(wt% / C.N.)
0
-2
-4
-6
-8
1
3
5
7
9
11
13
15
17
19
CARBON NUMBER
Experimental
NLR Fitted
ALPHA 1=0.69; ALPHA 2=0.94; XI=10;
PHI=1.091
\RUN43\P15NLR.CHT

FIGURE 95


SCHULZ-FLURY DISTRIBUTION
PLANT 700B, RUN 43, PERIOD 15
Ln(wt% / C.N.)
0
-5
-10
-15
1
51
101
151
201
251
301
CARBON NUMBER
Experimental
\RUN43\P15EXP.CHT

HC PRODUCT DISTRIBUTION
PLANT 700B RUN 43



\RUN43\GRPDIS.CHT

FIGURE 96

FIGURE 97

PERFORMANCE SUMMARY: TWO POTASSIUM ADDITION METHODS (LINED OUT CATALYSTS)

FLT/RUN NO.	701/37	701/42	701/43
K ADD. METHOD	K_2CO_3 IMPREG.	SOLID K LAURATE TO RX AT STARTUP	
CATALYST			
OXIDE PART, g	73	73	73
Fe, WT %	64.2	62.2	62.2
K, WT %	1.3	0.0	0.0
Fe:K, WT	100 : 2.1	—	—
K LAURATE, g		10	6.5
Fe:K, WT (TOTAL)	100 : 2.1	100 : 5.2	100 : 2.1
TEST CONDS.			
TEMP, °C	265	265	265
PRESS, PSIG	290	290	290
FEED RATE, (NL/HR · g Fe)	2.4	2.4	2.4
PERFORM. SUM.			
CONVER., %			
CO	78	78	78
H_2	63	58	60
PRODUCTIVITY (M CO/HR · g AT. Fe)	2.5	1.4	2.3
SELEC., MOLE %			
C_1	3.3	2.8	4.1
C_2	1.9	1.7	1.1
$(C_3 + C_4) \longrightarrow$	6.8	3.2	5.2
C_5^+	3.9	2.5	2.7
CO_2	47	45	47

1. FROM K_2O_3 IMPREGNATION

FIGURE 98

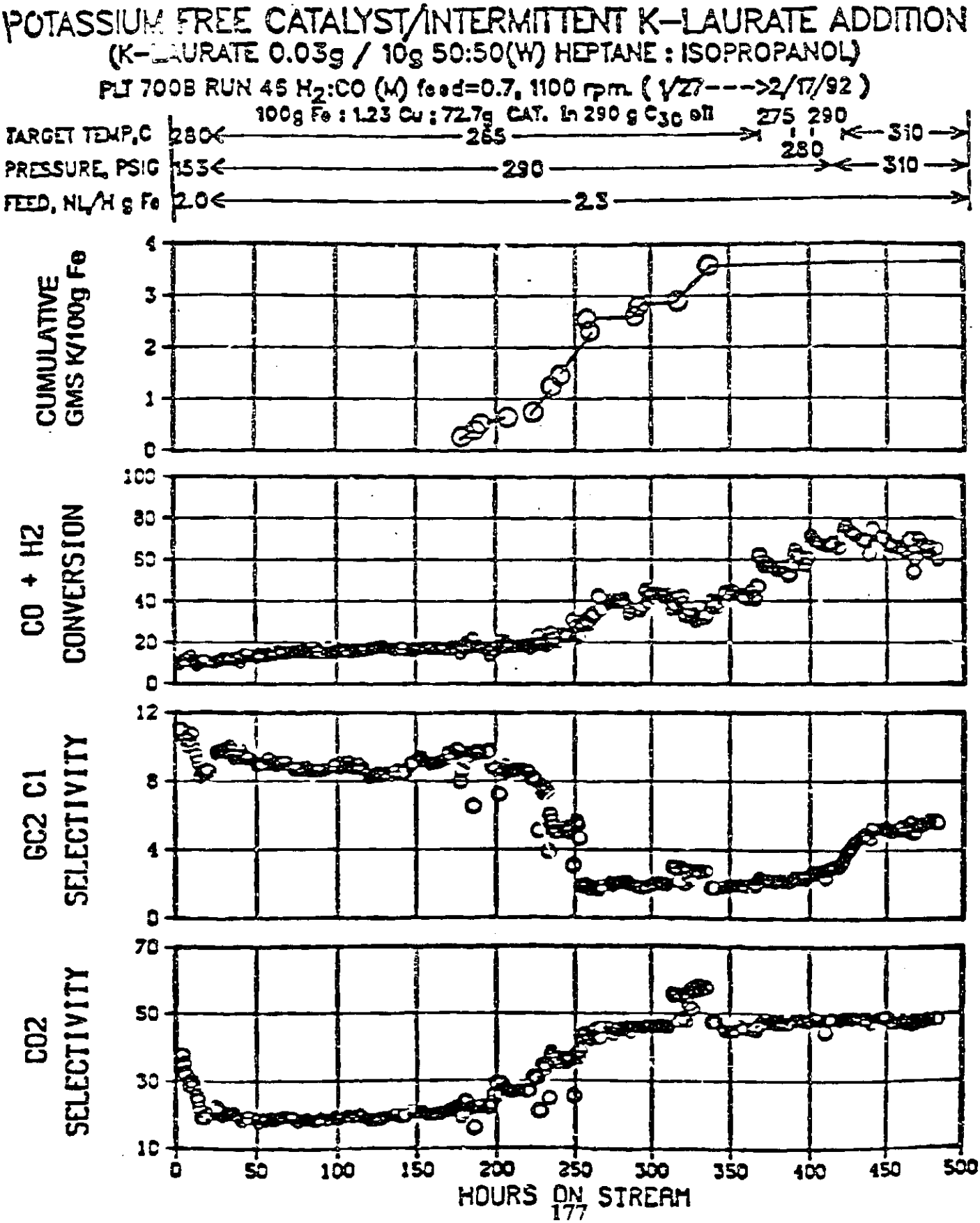

POTASSIUM FREE CATALYST/INTERMITTENT K-LAURATE ADDITION
(K-LAURATE 0.03g / 10g 50:50(W) HEPTANE : ISOPROPANOL)
PDU 700B RUN 45 H2:CO (M) feed=0.7, 1100 rpm. (1/27--->2/17/92)
100g Fe : 1.23 Cu : 72.7g CAT. in 290 g C30 oil
TARGET TEMP,C 280 265 275 290 280 310
PRESSURE, PSIG 153 290 290 310
FEED, NL/H g Fe 2.0 2.5
CUMULATIVE GMS K/100g Fe
CO + H2 CONVERSION
GC2 C1 SELECTIVITY
CO2 SELECTIVITY
HOURS ON STREAM

FIGURE 99

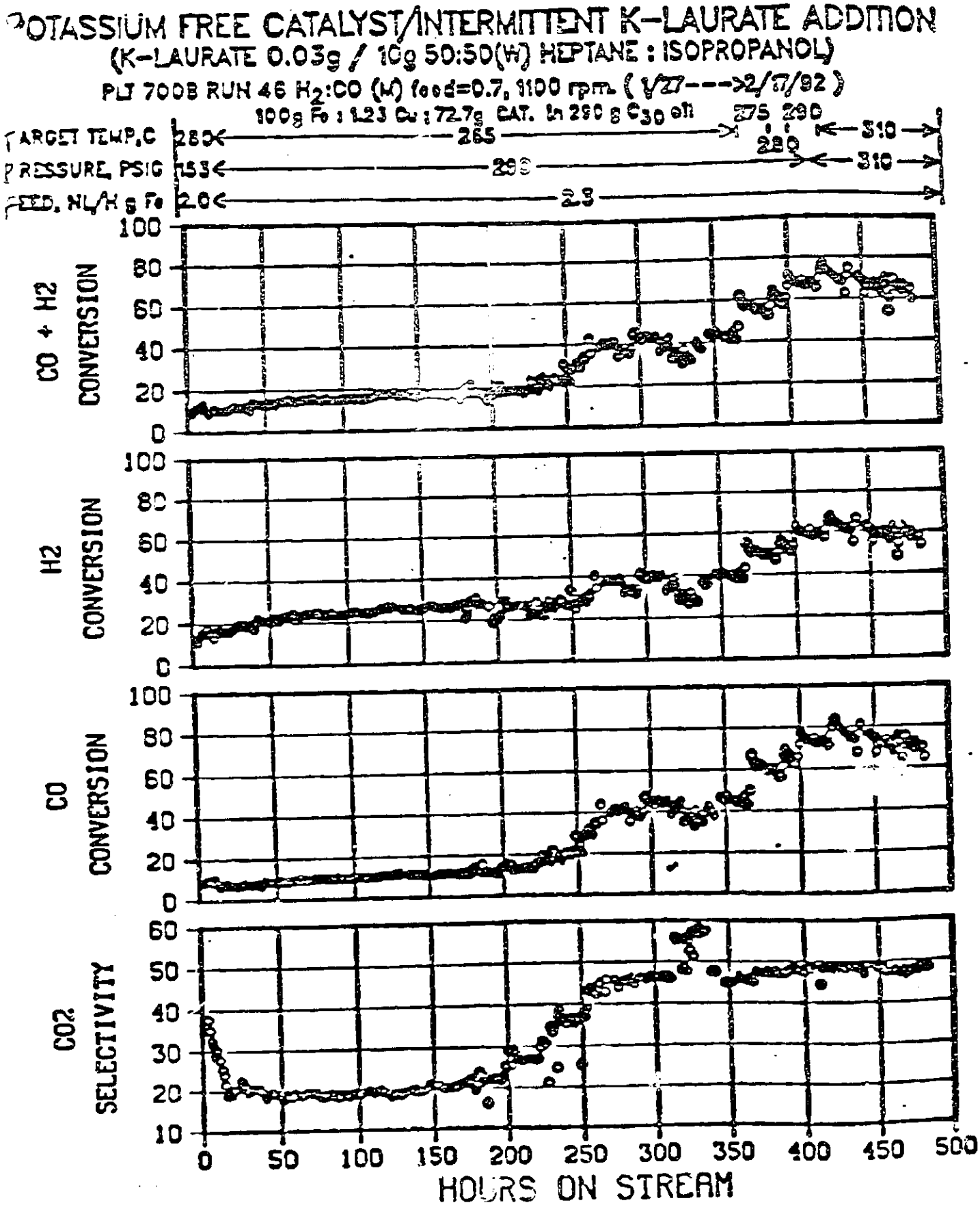
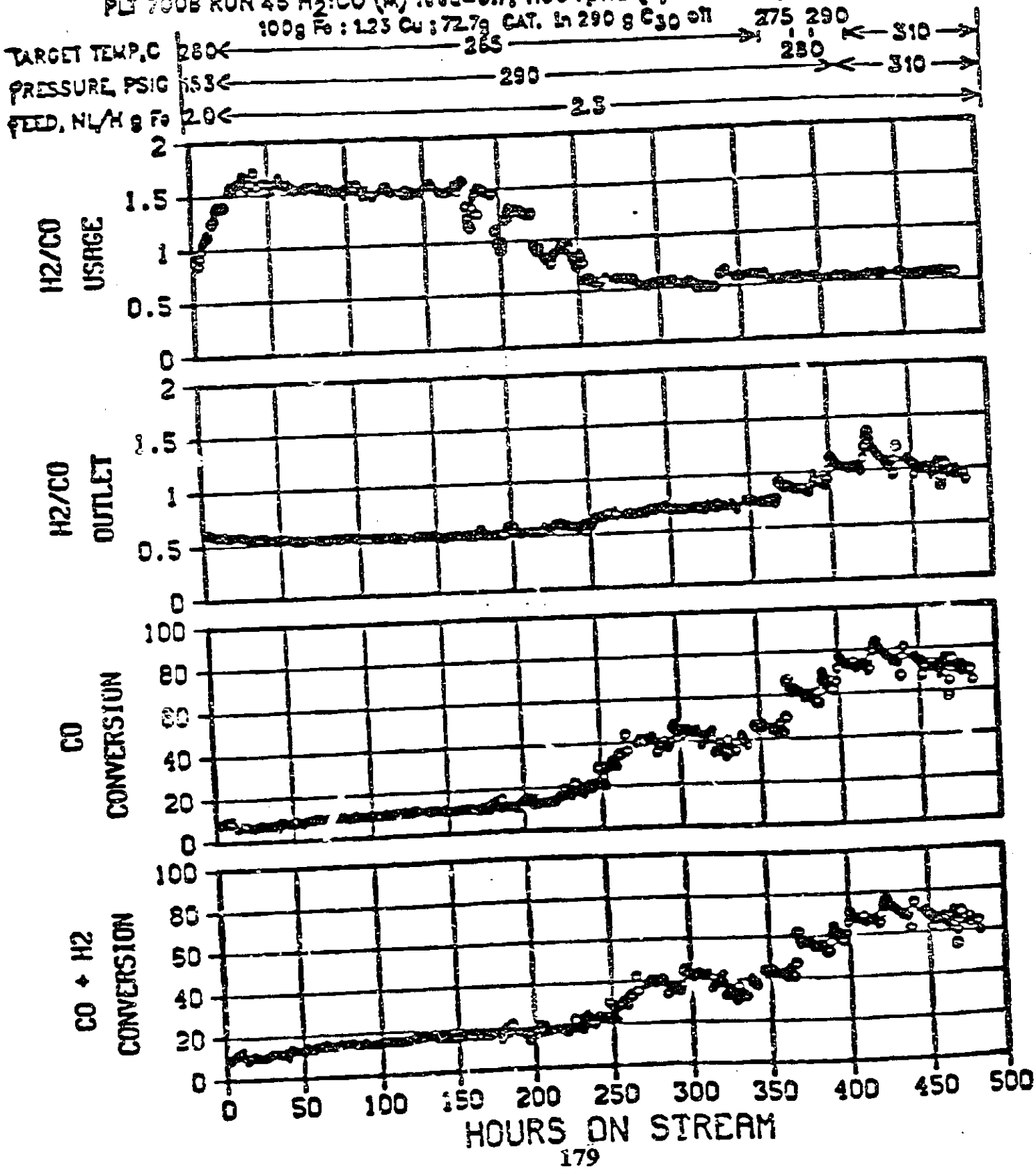

POTASSIUM FREE CATALYST/INTERMITTENT K-LAURATE ADDITION
(K-LAURATE 0.03g / 10g 50:50(W) HEPTANE : ISOPROPANOL)
PU 7008 RUN 46 H2:CO (M) feed=0.7, 1100 rpm. (V27--->2/17/92)
100g Fe : 1.23 Cu : 72.7g CAT. in 290 g C30 oil
TARGET TEMP,C 265 275 290 310
PRESSURE, PSIG 280 310
FEED, NL/H g Fe 2.0 2.3
CO + H2 CONVERSION
H2 CONVERSION
CO CONVERSION
CO2 SELECTIVITY
HOURS ON STREAM

FIGURE 100


POTASSIUM FREE CATALYST/INTERMITTENT K-LAURATE ADDITION
(K-LAURATE 0.03g / 10g 50:50(W) HEPTANE : ISOPROPANOL)
PLT 700B RUN 45 H2:CO (M) feed=0.7, 1100 rpm. (1/27--->2/17/82)
100g Fe : 1.23 Cu : 72.7g CAT. In 290 g C30 oil
TARGET TEMP,C
PRESSURE, PSIG
FEED, NL/H g Fe
275 290
280
310
265
290
2.5
H2/CO USAGE
H2/CO OUTLET
CO CONVERSION
CO + H2 CONVERSION
HOURS ON STREAM